Case 15: Malaria in pregnancy – live birth

Name	**A.A.**	**Date of admission**	5 May 2005
Age	28 years	**Date of discharge**	12 May 2005
I.P. No.:	1023241		
Parity	1 + 0 Gravida 2	**L.M.P.**	28 Nov. 2004
		Expected date of delivery	5 Sept. 2005
		Gestation by Dates	23 weeks

Presenting complaints

A.A. was admitted through casualty with a 3 day history of headache, hotness of the body, generalized body weakness and loss of appetite.

History of presenting complaints

She had been well until 3 days prior to admission when she developed a continuous global headache that was relieved by analgesics (paracetamol-asprin combination). A few hours later, she started experiencing hotness of the body, which was preceded by chills and rigors. It was associated with intermittent profuse sweating. She also developed body weakness which was associated with joint and muscle pains.

Three weeks prior to the onset of the above symptoms, she had travelled to Kisumu for 2 weeks and had not taken any chemoprohylaxis for malaria. She gave no history of diarrhoea or vomiting though she was nauseated. Her appetite was also poor. She was not coughing and micturation habits were normal. There was no history of altered level of consciousness.

She had not yet commenced antenatal care clinic. Quickening had occurred about four weeks earlier.

Past obstetric and gynecologic history

She was a para 1+0 having delivered in 1998 through a Caesarean section due to prolonged labour at term. The outcome was a live female infant with a weight of 2600 gm. The child is alive and well.

She attained menarché at 16 years. Her menses were regular coming every 28 days and lasting 3 days. It was of average flow with no associated dysmenorrhoea. She had not used any contraceptive method.

3. Blood group: O Rhesus positive
4. Serology for VDRL and HIV were both negative.
5. Urinalysis: Appearance – Amber, Albumin – nil, Blood – nil, Sugar – nil, Ketones – negative, Nitrites – negative, WBC – 4-6 PHF, RBC – NIL, Epithelial cells: 5 – 6 PHF, Casts – nil
6. Ultrasound: Showed a single viable foetus in variable lie, foetal heart rate was 120/ min, gestational age of 24 weeks 2 day. The foetus was grossly normal. The placenta was posterior and not low lying. Amniotic fluid was adequate.

Management

A.A. was admitted to the ward with the results from casualty. She was commenced on Intramuscular ß-arthemether 300mg immediately then 100mg daily for 4 days, intramuscular paracetamol 300mg immediately and to continue with oral paracetamol 1gm 8 hourly. Repeat blood slide for malaria two days after admission was negative.

The patient did well while in the ward. After 48 hours of admission, the fever had subsided, settling at 36.2°C. After the blood slide read negative, she was allowed home on hematinics and malaria prophylaxis (sulfadoxine-pyrimethamine combination 3 stat and then to repeat after 4 weeks) she was booked for antenatal clinic follow-up.

Antenatal follow-up

She was seen after one week and she had no complaints. The general examination was normal. The fundal height was found to correspond with dates. Fetal movements were present. The fetus was in cephalic presentation and longitudinal lie. The foetal heart tones remained regular. Blood pressure ranged from 100–120mmHg (systolic) and 60–70mmHg (diastolic). Weight gain was from 63.5kg at 25 weeks gestation to 71kg at 38 weeks. At 36 weeks an Erect Lateral Pelvimetry done at 36 weeks showed a true conjugate of 10cm. In view of the borderline pelvis and previous prolonged labour she was counselled for elective Caesarean section.

Re-admission for delivery

She was readmitted to maternity ward via the ANC at 38+ weeks. On admission, she was in good general condition, not pale or jaundiced, had no oedema. Her blood pressure was 110/70mmHg and the pulse rate was 80/min and was afebrile.

Abdominal examination showed that the fundal height was term with a single foetus in cephalic presentation and in longitudinal lie. Foetal heart rate was regular at a rate of 136/min. Estimated fetal weight was 3400 gm.

Pre-operative laboratory results revealed Hb 10.9g/dl, urea 2.8mmol/l, creatinine 69μmol/l, Sodium 139mmol/l and Potassium 3.7mmol/l. She was counselled about the operation and the consent form signed. Blood was taken for grouping and cross-match and 2 units were made available. Pubic hair was shaved the day before the operation. Atropine 0.6mg intramuscular was given half an hour before theatre. She delivered by elective Caesarean section to a live male infant 3300grammes whose Apgar score was 8 at 1 minute and 10 at 5 minute.She did well post operatively and was discharged home on the forth day.

Follow-up

She was seen after 6 weeks and had no complaints. Exclusive breast feeding was maintained. The wound was well healed. She was advised on contraception and referred to the family planning clinic where she opted for an intrauterine contraceptive device.

Discussion

Presented is A.A. who was a 28-year-old para 1+0 admitted at 24 weeks gestation with malaria. She had previously travelled to western Kenya without taking any chemoprophylaxis for malaria. She was treated with ß-artemether and recovered. She was thereafter given two doses of intermittent presumptive treatment of (sulfadoxine-pyrimethamine) during the subsequent antenatal follow-up. She was delivered at 38+ weeks via an elective Caesarean section due to CPD. The outcome was a live male infant with a good Apgar score and weighed 3400gms. The mother was given one more dose of chemoprophylaxis of sulfadoxine-pyrimethamine during postpartum follow-up.

Malaria is the most important parasitic disease of man affecting approximately 5% of the world's population. Malaria is caused by protozoa of the plasmodium species parasitizing the red blood cells and the liver after finding their way into the blood circulation through the bite of an infective female anopheline mosquito (1,2). There are four species of plasmodium that can infect man: *Plasmodium falciparum*, *Plasmodium ovale*, *Plasmodium malariae* and *Plasmodium vivax*. Of the four, *P. falciparum* is associated with the most severe form of malaria and the worst disease outcome (1,2,3). *P. falciparum* is also the predominant species that causes malaria (responsible for 98% of the cases) in most parts of Kenya as well as in the rest of Eastern and Southern Africa. The other species cause the remaining cases although they are rarely fatal. *P. vivax* is rare (2). A.A. had *P. falciparum* malaria.

An estimate of over 300 million acute illness and 1 million deaths per year are caused by malaria (3). Malaria infection during pregnancy is a major public health problem in tropical and subtropical regions throughout the world. Africa, south of the Sahara bears 90% of this global malaria burden (4). Each year, more than 30 million African women become pregnant in malaria endemic areas and are at risk of *P. falciparum* malaria infection during pregnancy, yet less than 5% of these pregnant women have access to effective intervention (5). In Kenya, malaria in pregnancy is common. Reports of its prevalence have varied from region to region (6,7). Rukaria (8) reported a prevalence of 21.2% in Kilifi while Nyamogo (9) reported a prevalence of 42% in Kisumu. The Kenyan Coastal and lake regions are hyperholoendemic areas, where there is a constant repeated infection. The population in these areas have high immunity and epidemics do not occur here (stable malaria) (1,6). In the regions like Aberdare ranges and Mt. Kenya

areas, transmission is intermittent as there is poor community immunity and epidemics do occur (unstable malaria) (l). A.A. lived and was brought up in Nairobi (unstable transmission) and had travelled to Nyanza where she contracted malaria.

In pregnant women with little or no pre-existing immunity, such as women from non-endemic areas, infection is associated with extremely high risks of both maternal and perinatal mortality. These women are at 2–3 times greater risk of developing severe disease than non-pregnant women and at approximately 3 times greater risk of dying if they do develop severe disease. In areas of moderate or high transmission (holo- or hyperendemic) including large parts of sub-Saharan Africa, adults usually have a high level of immunity to malaria which is maintained only by continued exposure to malaria infection. During pregnancy this immunity to malaria is altered. Immunity against malaria involves both cellular and humoral factors. Immunity is maintained by intermittent parasitaemia. Cellular immunity is in the form of phagocytosis by macrophages while humoral factors involve the production of specific antibodies. The increased propensity to malaria may be as a result of high cortisol levels found in pregnancy as well as the decreased cellular immunity especially seen in the third trimester. The glycoproteins of pregnancy have also been implicated by their inhibition of the transformation of monocytes into macrophages. Additionally, sequestration of the parasites in the placenta shields them from destruction by maternal effector cells (10). Pregnant women have higher rates of parasitaemia and higher density of parasitaemia than non-pregnant women. Primigravidae are affected most, with the risk of malaria decreasing with each successive pregnancy. Severe disease is uncommon and infection is frequently asymptomatic. Because it is asymptomatic, malaria may go unsuspected and undetected. However, placental parasitisation is common and malaria in pregnancy is associated with the development of severe maternal anaemia and low birth weight at delivery. Up to 40% of cases of severe anaemia in pregnancy may be prevented by administration of effective anti-malarials to pregnant women in endemic areas (10,11). Multiparity appears to counter some protection against this increased susceptibility during pregnancy such that the breakdown in immunity is most marked during the first pregnancy. However, this only holds true for those who have developed immunity. (2,11) A.A. was para 1+0. She was not exposed to persistent malaria challenge necessary for her to mount the semi-immunity found in those living in endemic areas.

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HIV infection in pregnancy reduces a pregnant woman's ability to fight malarial infection and increases the risk of i) asymptomatic parasetemia, ii) clinical malaria (both mild and severe disease), iii) parasite densities increase with decreasing CD4+ counts, iv) maternal anaemia in women with dual infection than those with either malaria or HIV infection only, and iv) low birth weight in women with dual infection than those with either malaria or HIV infection only. HIV alters the parity-dependent acquisition of malarial immunity therefore predisposing both primigravidae and multigravidae to infection. HIV-seropositive multigravidae had a two-fold increased probability of parasitaemia (6). The mechanism by which HIVinduces susceptability to malaria is thought to be impairment of both cellular and humaral immunity to malaria infection. Similarly, malaria infection has been associated with increased systemic and placental HIV-1 viral load, an effect which is reversible with successful antimalarial therapy. However, this increase is not associated with increased risk of HIV-1 transmission (6,10).

The clinical features of malaria include fever, joint pains, myalgia, nausea, vomiting, headache, generalised body weakness and other systemic symptoms depending on severity. The clinical signs include pallor, pyrexia and splenomegally. Hepatomegaly and jaundice may occur (2). A.A. presented with headache, fever, generalized body weakness, joint pains and myalgia. She was not jaundiced and was not anaemic.

Diagnosis of malaria is usually confirmed through laboratory investigations. A peripheral blood slide helps in identifying the malaria trophozoites and their quantification. The patient had moderate parasitemia (Blood slide for malaria was indicated as +++). Other features in the peripheral blood picture may include anisocytosis, macrocytosis and polychromasia with or without nucleated red cells. There may also be reticulocytosis (2,11) The bone marrow shows megaloblastic changes which may be gross. Malaria pigment is present in the macrophages. Iron stores tend to be increased unless there is concurrent iron deficiency (1) The mean haemoglobin level in pregnant women with malaria parasites has been found to be lower than in parasite negative women (10) A.A. had a Hb of 11.2g/dl. Other investigations that should be done to rule out other causes of pyrexia in pregnancy like urinary tract infection, typhoid and meningitis should be ruled out. A.A. had a normal urine for microscopy was normal and culture did not grow any bacteria. White blood cell count and differentials were normal. Rapid dip-stick tests are available as an aid to diagnosis and are recommended as a back-up to aid in diagnosis

in addition to microscopy. However, microscopy in the hands of an experienced microscopist remains the gold standard. In the future, PCR will make a valuable contribution to diagnosis. A.A. did not have the latter two tests done on her.

Complications of malaria in pregnancy could either be maternal or foetal/infant. (2,12)

1) Severe anaemia: according to WHO as Hb <7g/dl and very severe anaemia as Hb <5g/dl. Hemolytic anaemia due to malaria may develop rapidly, in which case it is usually highly symptomatic. Immune women present more insidious and may therefore be overlooked until very severe. Peripheral parasitaemia may be negative and malaria may then be overlooked as the cause of the anaemia. A.A. did not have anaemia.
2) Hypolycaemia (blood sugar <2.2 mmol/l) is more common in pregnant than non-pregnant women with malaria. It may be present prior to commencing treatment and in patients on quinine, due to quinine induced hyperinsulinism. Hypoglycaemia may result from release of insulin triggered by stimulation of pancreatic islet cells by products of malaria parasites or macrophages activation. Increased glucose consumption due to fever, malaria parasite and foetus also contribute to hypoglycaemia. It is associated with fetal heart rate abnormalities. A.A. did not have features of hypogylcemia.
3) Hyperparasitaemia. Peripheral parasitaemia >2% should be regarded as severe disease, warranting parenteral therapy. Peripheral parasitaemia >10% warrants admission to a high dependency or intensive care unit and consideration of exchange transfusion. We did not do a parasite count for A.A.
4) Coma. Any impairment of conscious level should be regarded as a sign of possible cerebral involvement. Patients with cerebral malaria may have signs of upper motor neurone lesion and may present with unrousable coma or seizures. A.A. did not have altered mentation.
5) Pulmonary edema is a serious complication, due to abnormal capillary permeability or as a consequence of over-hydration but can occur without positive fluid balance as adult respiratory distress syndrome (ARDS).
6) Renal failure. Oliguria or anuria is most likely to result from acute tubular necrosis.
7) Coagulopathy. Thrombocytopenia commonly occurs with malaria. A platelet count <20 x 10^9/l or any other clinical or hematological evidence of DIC indicate the need for urgent intervention. A.A. had normal platelet count.

8) Clinical jaundice (or bilirubin >50 mmol/l) results from hemolysis, leading to a rise in unconjugated bilirubin.
9) Shock may be due to dehydration or sepsis with or without DIC.
10) Acidosis due to lactic acidosis, which should resolve during the early stages of resuscitation and treatment, as tissue perfusion and oxygenation improve. Failure of lactic acidosis to resolve is associated with a poor prognosis.

In the foetus, plasmodium falciparum malaria during pregnancy increases chances of abortion, prematurity, intrauterine growth restriction and infant low birth weight, which is the single most common risk factor for death in infants (12). Malaria has been estimated to cause 8% to 14% of all low birth weight babies and 3 – 8% of all infant deaths in areas of Africa with stable malaria transmission (3). Impaired foetal growth results from reduced placental blood circulation in the intervillous space that develops from placental parasitization. This causes thickening of the syncytiotrophoblast basement membrane and an intravillous inflamatory response occurs with infiltration by mononuclear inflammatory cells resulting in altered placental integrity. This impedes oxygen-nutrient transfer to the fetus causing intrauterine growth retardation and low birth weight, fetal distress and fetal demise (11,12,13). Fortunately, in our patient, the foetus was appropriately grown for its gestational age. The foetus is usually protected from acquiring malaria in the uterus by the placental barrier, circulating maternal. antibodies and the fact that the foetal haemoglobin (HbF) is more resistant to the parasite. However, congenital malaria may occasionally develop especially in non immune women (2,11,14) and the incidence of congenital malaria in endemic areas is estimated to be 0.7% and 1–4% in epidemic areas (1,15,16). A study in Malawi detected parasites in 35% of cord blood of infants whose mothers were infected with malaria (14). However, neonates in Africa rarely present with clinical disease.

Treatment of malaria is dependent on the geographical area and the local pattern of drug resistance. The aim of the treatment in malaria is to reduce pyrexia and stop the attack as quickly as possible (1,2,15). Patients with severe malaria are hospitalized and given parenteral quinine treatment. Those with milder forms of malaria are given 4-aminoquinolones, chloroquine, amodiaquine and sulphadoxine-pyrimenthamine combination as drugs of choice. The Quinhosa derivatives such as artemesinin or artemether, and quinine may also be used after first trimester and in severe malaria.

(2,3,7,10,16). Where artemisinins are used, women should be followed up to document pregnancy outcome and child development. Tetracyclines halofantrine and premaquine should not be used in pregnancy (16). WHO recommends that all pregnant women with severe anaemia living in malaria endemic areas should be given full effective antimalarial treatment even if periferal films are negative and there are no other features to suggest malaria (16). A.A. was treated with parenteral ß-artemether.

During labour and delivery, in severe attacks of malaria, the poor state of the mother may be an indication for shortening of the second stage of labour by vacuum delivery. Care is taken to avoid postpartum haemorrhage or cardiac failure that may occur in moderately or severely anaemic mothers after delivery. Active management of third stage is recommended (2,11). This was not done in our patient as she was delivered by Caesarean section due to CPD.

After successful treatment, malaria chemoprophylaxis is necessary throughout the remaining period of pregnancy including peuperium. This clears and prevents placental parasitization (1,6). Our patient was given 2 doses of sulfadoxine-pyrimethamine combination during the remaining antenatal period and one more dose after delivery. She was also advised on the use of treated mosquito nets. Avoidance of bites is of paramount importance. Long sleeved garments should be worn after dark and exposed skin should be well covered in insect repellent such as a preparation containing diethyl-toluamide (DEET) 35% (2). For the non-immune travellers prophylaxis with proguanil should be continued for 6 weeks after leaving the malaria endemic area (2,10,11).

Prevention of malaria during pregnancy requires a package consisting of intermittent preventive treatment (IPT) and insecticide treated bed-nets (ITNs), particularly in areas of stable malaria transmission, and case management of malarial illnesses (15,16). ROLL BACK MALARIA is a global partnership founded in 1998 by the World Health Organization (WHO), the United Nations Development Programme (UNDP), the United National Children Fund (UNICEF) and World Bank with the goal of halving the world's malaria burden by 2010. One of the foci of this partnership is to strengthen care management of malaria for all pregnant women and to prevent malaria during pregnancy using cost effective preventive approaches (IPT and ITNs) delivered through ANCs and programmes that provide service to the community.

Intermittent preventive treatment involves providing all pregnant women with at least two preventive treatments of an effective anti-malaria drug. This approach has been shown to be safe, inexpensive and effective. One study in Malawi evaluating IPT showed a decline in placental infection (32% to 23%) and in the number of low birth weight babies (23% to 10%). It also found that 75% of all pregnant women took advantage of IPT when offered (6). Insecticide-Treated Nets (ITN's) decrease both the number of malaria cases and malaria death rates in pregnant women and their children. A study in an area of high malaria transmission in Kenya has shown that women protected by ITNs every night during their first four pregnancies produce 25% fewer underweight or premature babies (1). In addition, ITN use also benefits the infant who sleeps under the net with the mother by decreasing exposure to malaria infection.

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LONG COMMENTARY

IN OBSTETRICS

SEXUALITY AND SEXUAL ACTIVITY IN PREGNANCY AS SEEN IN KERUGOYA DISTRICT HOSPITAL

Definition of terms

Coitus Sexual union. In this study uses any type (penile-vaginal, penile-anal, penile-oral, and other acts such as instrumentation) of heterosexual sexual activity to encompass the term.

Coital act Used interchangably with coital session.

Coital session In this study it is used to mean any coital act which ends in male orgasm.

Trimester An arbitrary division of the 42 weeks gestation period. Usually divided into three.

Sexual activity Equivalent to coitus, or any activity done prior to coitus, e.g., fondling, kissing, holding.

Sexuality Human sexuality is a comprehensive concept that combines physical capacity for sexual arousal, that is, libido and the personal and social meanings attached to sexual behaviour and development of sexual and gender identities.

Placenta previa A low lying placenta covering internal os either partially or totally

Premature rupture of membranes Any drainage of amniotic fluid due to a defect on the amniotic membranes after 37 weeks gestation but before the onset of labour.

Preterm rupture of membranes Any drainage of amniotic fluid before 37 weeks gestation but before the onset of labour.

McDonald stitch A cerclage suture placed on the cervix during pregnancy in cases of cervical incompetence.

Multiple gestations gestation in which there is more than one viable fetus in the uterus simultaneously.

Summary

Introduction: Sexual activity and sexuality on average decreases throughout pregnancy. The return to regular sexual activity only begins after puerperium but does not return to the prepregnancy state in most cases. There are inter-community variations due to cultural beliefs and practices. Some reasons cited for the reduced activity are fears and concerns both for the mother and fetus by both partners. Myths and cultural beliefs affect and dictate sexuality and sexual activities of couples both in and outside pregnancy. Changes in sexuality and sexual activity during the transition period into parenthood bring a major challenge not only to couples but also to the medical personnel both of whom do not have the expertise to discuss the topic confidently and conclusively.

Objectives: In this study the aim was to explore and analyse the sexuality and sexual activity of expectant women visiting the antenatal clinic with a view to correlating the frequency of coitus to gestational age. Also sought for were the clients concerns and fears and how this related to their knowledge of sexuality and sexual activity.

Study design: This was a cross-sectional study

Study area and population: The study was carried out in Kerugoya District Hospital, Central Province, over a 6 month duration; between May 2004 to October 2004. The study population was 323 pregnant clients aged 15–45 years visiting the antenatal clinic at different gestational periods.

Data collection and analysis: The data was obtained by use of a questionnaire administered by the research group and the results analysed using SPSS system.

Results: The study group comprised of the inhabitants of Kirinyaga who are mainly Kikuyus who had few cultural beliefs on sexual activity in pregnancy. Sexual activity and desire were reduced in all trimesters of pregnancy with the second trimester being least affected. Of the study population 72.4% had reduced sexual desire, 10.2% had increased sexual desire, 17.1% had no change. This translated to a reduced coital frequency from 3 times per week to a single act per week during pregnancy. Discomfort and feeling tired during coitus was the main reason cited and reported by 28% and 26% of the clients respectively. Sexual gratification (orgasm) was always present in 74.6%

and presemt sometimes in 23.5%, while 1.9% who did not attain orgasm at all. Over 70% of the clients believed that coitus in pregnancy did not harm them, their spouses or their fetuses. Most clients (97.8%) were comfortable discussing this topic during the research but complained that their health care provider never initiated the discussion of this topic with them.

Conclusion: Sexual activity and sexuality were reduced significantly in pregnancy from a median coital sessions of 3 per week in the prepregnancy state to once per week during pregnancy. Medical personnel need to be educated on ways of approaching this topic so that they may impart basic and correct information to their clients.

Introduction and literature review

Human sexuality is a comprehensive concept that combines physical capacity for sexual arousal, that is, libido and the personal and social meanings attached to sexual behaviour and development of sexual and gender identities (1). The elements of human sexuality fall in four broad categories. These are:

Sexual partnerships under which the onset, frequency of sexual relationships and changes in partnerships and the conditions of changes are covered. The sexual orientation, that is, heterosexuality, homosexuality, bisexuality and bestiality are also broadly covered in this category.

Sexual acts: in this, the act of coitus is generally covered. The types of coitus can be penile-vaginal, penile-anal, penile-oral, and any other act such as instrumentation. Also covered in this category is sexual inter-femora as used to happen in the African communities in unmarried couples. Rubbing, masturbation and different sexual position can also be categorised in this area.

Some authorities would cover both of the above categories under sexual behaviour and practices.

Sexual ideology, meanings, and enjoyment: under these, the cultural aspects and personal beliefs and thoughts are included. It is important to note that these play a major role in determining the sexual behaviour.

Sexual experience: these encompass the emotional and psychological factors that arise from self. These can easily be affected by the environment and several external factors.

All these categories are closely related and therefore cannot be discussed as single entities.

Human sexuality develops gradually from conception where the genetic sex of the fetus is determined and continues almost continuously well into adulthood due to the different inputs from the external and internal environment. The central control of sexual behaviour is from the cortical areas: inferior temporal lobe, right fronto-orbital cortex, left anterior cingulate cortex, right insula and the right caudate nucleus. These have a function of controlling the higher centres and the limbic system. Other important inputs are from the hormones especially oestrogens, progesterones, androgens, and prolactin.

The hypo-thalamo-pituitary-gonadal axis may play a key role as the neurohumoral controller. The cultural inputs, some of which are positive and sometimes negative, also play a very important role in determining sexuality (1).

The physiological response to sexual stimuli was first studied by Masters and Johnson (2). They described the phases of sexual response in four phases. These were classified in the EPOR model which constitute the sexual response cycle; excitement (E), plateau (P), orgasmic (O) and resolution (R) (1,3). These have been used as a gold standard for studying sexual activity albeit with multiple criticisms. Multiple physiological and anatomical changes accompany the sexual response cycle. In summary these can be described as follows. On arousal there is evidence of peripheral vasocongestion, an increase in heart rate and an increase in alpha-wave activity in the brain. These mark the excitement period. With continued stimulation the plateau phase begins. It is marked by continued vasocongestion, increased muscle tone, increased lubrication of the vagina. This is followed by orgasmic phase. In this, there are generalised rhythmic smooth and skeletal muscle contraction. The uterine contractions last 0.8 seconds and may be as many as 8 per minute. Sometimes these may be tetanic lasting about 90 seconds (1,2,3). These contractions are important in pregnancy and in the postmenopausal stage. These may be perceived as pain and therefore play an important role in sexual dysfunction in pregnancy. The resolution phase is characterised by return to a physiological "baseline", in which the changes above return to the pre-excitetory phase. Although the sexual cycle has the 4 phases these merge into each other and do not have a specific time duration from minutes to hours. These vary between individuals, sex and also in the same person depending on the physiological and psychological state. Also important to note is that the full cycle may not be achieved, or may be achieved, in some couples, for the first time during pregnancy. These works are criticised for not critically incorporating cultural attitudes on sexual behaviour into the research (4).

Due to the complexity of human sexuality there exists multiple problems that may alter sexuality. Pregnancy is a period characterised by multiple physical, psychological and social changes. It is associated with drastic changes in human sexuality. In the sexual cycle, for example, the pregnant women may experience severe breast pains frequently localised at the nipples, feeling of pelvic fullness, and prolongation of the resolution phase for hours may contribute to sexual dysfunctions (1). This leads to important

variations in sexuality and sexual activity (4). Sexual relationships change in marriage and transition to parenthood, that is during pregnancy. This can lead to psychological crisis for both the partners (5). As with any transition there may be a sense of loss which may lead to marital problems immediately or later (6). This is especially important if the couples are not advised and informed on issues of sexuality and pregnancy.

Normal sexual activity is seen to reduce in pregnancy as compared to the pre-pregnancy state. Studies have shown that on average 90% of women reported a coital frequency of 1–12 times per week (over 50% reporting between 1–4 times per week) with their spouses. Women not on contraceptives because they wanted to concieve had a higher coital frequency then other women using coitus for pleasure(7). This activity is seen to resume several months after delivery but in some cases to less than the pre-pregnancy state (1,8,9). This can lead to marital conflicts. In the postpartum period sexual activity resumes to a lesser extent and may take up to one year (10,11) and is seen to take longer for those mothers who are breast feeding (5). On average however research has shown that sexual activity returns by 6 to 8 weeks postpartum but can occur as soon as 1 week later. The major determinants of delay in the onset of sexual activity are vaginal lacerations, presence of episiotomy and presence of lochia. Those undergoing Caesarean section as the mode of delivery commence sexual activity earlier (11,12).

Hormonal changes have a major contribution to the changes in sexual activity, the major ones being prolactin and prolonged hypo-estrogenization. These have been associated with reduced sexual drive. In addition, lactating women with diminished sexual desire have been found to have significantly lower levels of androstenedione and testosterone than their counterparts whose sexual interest was not severely reduced (5). Oxytocin receptors increase with advancement of pregnancy (13). This hormone is involved in the orgasmic phase. Release of the same during orgasm in the later part of pregnancy may therefore play a role in causing painful uterine contractions (1).

Sexual activity in pregnancy is proscribed in certain instances.

- Bleeding of vaginal or uterine origin, for example, due to placenta previa has the risk of inducing antepartum haemorrhage with subsequent morbidity and in severe cases mortality (1).

- Partial dilatation of the cervix may lead to premature labour or rupture of membranes with pregnancy loss (1).
- Premature and preterm rupture of membranes with or without evidence of infection due to passage of infection to the uterine cavity and the contents therein, leading to chorioamnionitis and fetal infections (1).
- Prior history of premature delivery with or without McDonald stitch (13).
- Semen is known to have prostaglandins which may cause uterine contractions and subsequent pregnancy loss. Multiple gestations are a risk factor for preterm labour. This may be aggravated by the prostaglandins in semen and oxytocin released during the female orgasm (13).
- Though not always true there is the factor of discomfort which is commoner in multiple gestations (13), and also instances where there is compromised fetal oxygenation or uterine instability (1).

Cultural inputs play a central role in determining sexuality and sexual activity in pregnancy by setting out rules. These have been passed down from ancestors to the current generation (as discussed below). Some cultural beliefs discouraged sexual activity because it was thought that the semen impaired the eye sight of the unborn child or even caused death by choking. Others forbid coitus after onset of quickening. In Nigeria it was believed coitus in pregnancy caused still births, prematurity and perinatal mortality. In the Victorian times sexual activity in pregnancy was thought to lead to physical and mental anormalies of the unborn child while abstinence led to the child being intelligent. Not all cultures proscribe sexual activity during pregnancy. The Hindus believed that semen actually nourished the fetus and therefore coitus was encouraged during pregnancy. In Sweden this was encouraged to facilitate the induction of labour. Sexual beliefs extended into puerperium. In Persia, coitus within the first two weeks of puerperium was punishable by death for those involved. (1)

It is generally accepted that sexual activity in normal healthy pregnancies is not harmful before 36 weeks gestation (13,14). By 36 weeks 72% of pregnant women report having coitus less than once weekly. However these figures may have methodological flaws due to the small sample sizes which therefore may not be representative of the population

(12,15). Some studies have shown that there may be few changes in sexual activity (16). Vaginal intercourse and sexual activity on average decreases throughout pregnancy with the trimester of pregnancy being the only independent predictor (4,17). This is also further reduced in case of concurrent pathology or maternal morbidity. In cardiac disease 80% of outpatients (New Yolk Heart Association 1 and 2) would have coitus at least once per week (18) as opposed to normal pregnancies which report a frequency of at least 1.3 to 1.8 times per week (8). However in some 32% of couples coital frequency of about (2.3 times per week) remains the same, and increases in 4% of the women (8). On average sexual activity declines slightly in the first trimester, has variable changes, that is, increases or decreases in the second trimester (12,16,19). There is a general decline in the third trimester. More than 75–80% of couples do not have coitus in the latter part of the third trimester (1,12).

The decreased sexual desire by both the spouses and especially the women (4,8), is due to increased concerns of nausea and vomiting in early pregnancy, fear of abortions, fear of harm to the fetus, physical awkwardness , lack of interest, discomfort, fear of membrane rupture, fear (of infection and fatigue (8,20). Female genital mutilation in some African contexts can also predispose one to a reduced sexual activity both in and outside pregnancy. Early examination of these patients is therefore important for proper counselling on sexuality in the context of female genital mutilation. Myths to be dispelled on sexuality and sexual activity are usually due to cultural teachings and patients own thoughts or advice from peers and sometimes from the health care providers. Amongst them include the fear that it may cause miscarriage, premature labour, or fetal damage (21). There is no significant increase in fetal problems in women who continue to be sexually active throughout pregnancy. However, those women (27%) who experience painful uterine contractions during orgasm are less likely to have sexual intercourse often or at all (21).

Pregnancy is associated with immunoregulation. The cellular arm of the immunity is regulated especially in the T Helper 2 cells. Due to hormonal influences the glycogen storage in vaginal mucosa increases. This can, therefore, lead to recurrent infections especially of the female genital tract due to increased growth of the normal candida albicans in the vaginal cavity (13). Antibiotic usage may also alter vaginal flora therefore causing vaginal candidiasis. Most of the couples unless well informed of these changes

or the causes of these recurrent infections blame the other spouse of having extramarital affairs and therefore infecting them. This can be one of the causes of reduced sexual drive in pregnancy.

Sexual desire is generally reduced more in primigravidae as compared to multigravidae (22) while in the younger age group, multiparity, low-level of education and lesser duration of marriage is associated with increased frequency of sexual activity in pregnancy (9). In the men sexual desire is also generally reduced. The major contributory factors being age and concern about the fetus (23). In most polygamous communities coitus was generally proscribed in pregnancy and the puerperium and in some instances until the infant was old enough. For this reason the husband would seek sexual gratification from the other spouses. Poor conjugal relationships prior to pregnancy also contribute to a reduction in sexual activity with the decline in sexual activity being more than that of good conjugal relationships prior to pregnancy (24).

However all these researches rely on recall memory and may lead to a source of misclassification (25). Reliance on retrospective reports may surfice as a source of data. However data records may not be adequate in our context and therefore the reliance on the recall.

Sexual gratification, that is, orgasmic capacity in females decreased during pregnancy (16,24,26). In a study carried out in Australia targeting couples in the second and third trimesters, a third of the male counterparts did not achieve orgasm especially when practising penile vaginal penetrative coitus (27). The period of abstinence from coitus before and after delivery varied considerably (26). The pregnant women generally do not initiate the process of love making and coitus (about 2%) (4,8). The husband initiated sexual intercourse most of the times (8), but both partners did in just over a third of the times. This could be attributed to the generalized reduced interest in coitus during pregnancy.

Sexual activity is generally thought to be safe (13,14) and there are no associated unfavourable perinatal outcomes (1). Some studies carried out showed an inverse association between coitus and early delivery (1,28). However there may be fetal bradycardia associated with orgasm but which is only transient and not associated with fetal distress (1).

There are however dangers associated with sexual activity in pregnancy. These are:

(1) Sexually transmitted infections. This is more important in the teenagers, single women of low economic status and drug addicts/abusers (29). In one study 38% of all pregnant adolescents had at least one sexually transmitted infection. This is high compared to 16% for those aged 25 years and above. There are associations of infections and abortions following coitus (1). Safe sexual activity measures should therefore be encouraged in pregnancy especially in the teenagers.

(2) Human immunodeficiency virus (HIV). In 2001, the World Health Organization reported 4.3 million new HIV infections in adults globally, 41% of these in women. The main risk factor for HIV infection in the women was heterosexual contact (73–90%) (21,30). This translates directly to the high prevalence in pregnant women who form a significant proportion of the population referred to above.

(3) Premature/preterm rupture of membranes. This is more important if there is a concurrent sexually transmitted infection especially gonorrhoeal infections (1). This infections can complicate by ascending into the uterus and may infect the fetus. These fetuses may present cases of congenital pneumonia which may increase perinatal mortality. There is an association though not conclusive that sexual activity with the male superior position is associated with premature preterm rupture of membranes. However, there have been conflicting results as to whether sexual intercourse does cause premature/preterm rapture of membranes (1).

(4) Sexual activity can rarely indirectly lead to grave maternal morbidity and sometimes mortality. Deaths and near miss have been associated with air embolisms with cunnilingus and vaginal safuration (28,31,32). This is especially important if oral-vaginal coitus is practiced or where instrumentation is common.

There are positive psychological meanings in regards to femininity and sexuality in the couples that remain active in pregnancy. Abstinence on the other hand can be alienating at the time when the couple need to maintain their bonds with each other. More research needs to be carried out in the medical benefits of sexual activity in pregnancy (1) as these have not been clearly elucidated.

In Nigeria studies show on overall that 28% of men had extramarital sexual relationships during pregnancy as a way of satisfying their "unmet sexual needs" (33). This as discussed earlier could be due to the changes occurring in pregnancy or due to cultural beliefs. This is important as Human Immunodeficiency Virus spread can easily occur during this period of pregnancy and immediate postpartum period. Faithfulness within the spouses is one of the strategies used to reduce the human immunodeficiency virus spread globally (34). Proper knowledge and understanding of sexuality and sexual activity in pregnancy would therefore play a role in reducing the spread by reducing the extramarital relations.

Women and pregnant mothers in general do not discuss sexuality with their doctors or health care providers due to cultural "norms", fear of introducing the topic (21). Less than a third (29%) of women obtained information regarding sexual activity from their doctor (35). Frequently the woman was the first person to introduce the topic and felt uncomfortable raising the subject. A large number (about three quarter) of the women whose doctors did not discuss the sexual issues with them felt they should be discussed (4). Health care providers are also not armed with proper tools on approaching this topic and also end up misrepresenting the views. Doctors should inform their clients of the psychosexual changes that may occur in pregnancy and reassure them that sexual intercourse will not normally cause complications in pregnancy (4). A proper foundation on this topic is therefore necessary for purposes of providing information to the patients and clients both in the public and private practice. As of now there has not been any study carried out in Kenya to establish the frequency of sexual activity and sexuality in pregnancy.

Rationale

Due to the complexity of human sexuality there exists multiple problems that may alter sexuality. Pregnancy being a period characterised by multiple physical, psychological and social changes is associated with drastic changes in human sexuality. In the sexual cycle, for example, the pregnant women may experience severe breast pains frequently localised at the nipples, feeling of pelvic fullness, and prolongation of the resolution phase of the sexual cycle for hours thus contributing to sexual dysfunctions. This leads to important variations in sexuality and sexual activity. Sexual relationships change in marriage and in during pregnancy. This can lead to psychological crisis for both the partners. As with any transition there may be a sense of loss which may lead to marital problems immediately or later. This is especially important if the couples are not advised and informed on issues of sexuality and pregnancy. This study explores the extent to which sexual activity and sexulity are affected in pregnancy.

Objectives

Main Objective

To assess the sexual activity and sexuality of expectant mothers visiting antenatal clinic in Kerugoya District Hospital.

Specific Objectives

These were:

1. To determine the sociodemographic characteristics to the participating in the study.
2. To determine the frequency of coitus during pregnancy.
3. To determine the knowledge on sexuality and sexual activity during pregnancy and the factors affecting it.
4. To correlate coital frequency to the gestation age.
5. To determine clients desire, beliefs and myths as regards to sexuality in pregnancy.

Study Design and Methodology

Study design

This was a descriptive cross-sectional study

Study area

The study was conducted in Kerugoya District Hospital, Kirinyaga District of Central Province, Kenya. This hospital is located along the Kutus-Karatina road and is on the south fringe of Kerugoya town. The Hospital is headed by a Medical Superintendent, who also doubles as the District Surgeon and sometimes as the District Medical Officer of Health.

This is a district hospital and therefore offers both outpatient and inpatient services. The inpatient department is divided into wards. There is a maternity ward which has the antenatal, postnatal, labour wards and nursery combined. The gynaecology ward is separate. The maternity wing has a capacity of 50 beds. The average number of patients delivering per month is 250. The gynaecology ward has a capacity of 12 beds. This department is headed by a consultant Obstetrician and Gynaecologist (who is also the District Obstetrician and Gynaecologist) with 2 medical officers and a team of qualified midwife nurses assisting him.

The antenatal and gynaecology outpatient clinics are integrated into the Maternal Child Health clinic. The antenatal clinic reviews about 50–100 clients per day. The gynaecology outpatient clinic is run once a week and reviews about 30 patients. The family planning unit offers all the family planning methods available. Approximately 80 clients attend the family planning clinic per day. These constitute follow up clients and new clients. This clinic is mainly run by nurses who have qualified in contraceptive services provision. They provide, for a small fee which goes into the Facility Development Funds (FIF), most of the contraceptive methods offered by the Ministry of Health. The consultants and medical officers are consulted when the nurses encounter a difficult situation. Implants are mainly left for the medical officers to insert and remove as the nurses, though qualified, are not confident in performing the procedures unsupervised.

Other departments which support the obstetrics and gynaecology department are the occupational therapy, physiotherapy, X–ray, stores, procurement, among others.

Study population

The study population comprised of clients attending antenatal care at the hospital. All women at the clinic who were willing to participate were recruited as long as they satisfied the inclusion criteria.

The women were classified into three groups according to the trimesters of pregnancy as calculated from the first day of the last menstrual period. The first trimester was taken to be less than 14 weeks, the second trimester between 14 weeks and 28 weeks, and the third trimester above 28 weeks. The first day of the Last Menstrual Period was enquired from the client and confirmed on the antenatal card. Clinical examination of the fundal height and/or ultrasound scan when available was used to estimate the trimester for the clients who were not sure of dates.

Inclusion Criteria

All pregnant mothers attending antenatal clinic during the study period except those who were excluded as per the exclusion criteria were eligible to be included in the study. These clients had to give an informed written consent prior to inclusion into the study. The consent form is shown in the appendix.

Exclusion Criteria

All pregnant mothers in whom sexual activity was proscribed on medical grounds. These being:

(1) due to proven or suspected per vaginal bleeding,
(2) confirmed placenta previa
(3) partial dilatation of the cervix,
(4) premature and preterm rupture of membranes,
(5) prior history of premature delivery with or without McDonald stitch,
(6) multiple gestation,

The criteria above was identified by history taking and/or physical examination or by diagnostic imaging, e.g. ultrasound

(7) those who did not consent to be included in the study.

Sample size

Using the formula

$$n = \frac{z^2pq}{d^2}$$

Where:

- n = the desired sample size (when the population is greater than 10,000).
- z = the standard normal deviation, usually set at 1.96 which corresponds to the 95% confidence level.
- p = frequency of coitus is 2.3 times per week. Assuming this represents 100% the frequency of 1.3 times per week (8) would represent 56.2% (0.56)
- q = 1.0 – p
- d = degree of accuracy desired set at 0.05

Therefore

$$n = \frac{(1.96)^2(0.56)(.44)}{(0.05)^2}$$

$$n = 378$$

Simple random sampling (every third client) was used in selecting the clients.

Data Collection

Sampling method

Pretest questionnaires were administered to the clients prior to the study. A questionnaire was administered to all pregnant mothers who were willing to participate in the study and who met the inclusion criteria. This was administered by either of the 2 research assistants who were qualified midwives and previously trained to administer the questionnaire. The researcher also took part in administering the questionnaire. The research assistants had undergone prior training by the researcher on the method of filling the questionnaire in either of the translations used. They were stationed at the antenatal clinics. They completed questionnaires by asking the clients the questions therein. The questionnaire was administered after the client had been reviewed in the antenatal clinic. There were open-ended and close-ended questions.

Materials

These comprised of questionnaires that were administered by a research assistant or self-administered. The questionnaire was divided into sections ranging from the clients sociodemographic data to the sexual history. There were three languages used; English, Swahili and Kikuyu. After completing the questionnaires were collected and compiled by the researcher. The questionnaire had been pretested prior to the onset of the study in the same centre.

Procedures

The clients had a questionnaire administered by a research assistant. The questionnaire was administered to the clients who consented to participate in the study in English or in Kikuyu or Kiswahili for those who did not understand English..

Data management

The data was coded and entered into a computer and analysed using the computer programme SPSS System and proportions used to describe the data.

The data was validated before analysis.

The data was analysed in descriptive terms such as means, percentages, standard deviation, medians, frequency distribution and then tabulated.

Multiple regressions were performed to access the association of a variety of factors with the outcomes relating to sexual activity in pregnancy.

Non-numerical variables were also analysed.

Study limitations

The concept of sexuality may have been misunderstood to mean sexual activity. Most people equate sexuality to sexual activity.

The male spouse was excluded in this study, that is, it was a "women only study" as the clients rarely visited the antenatal clinics with their spouses. This meant that we did not get the male input in the study.

Cultural issues were of major concern. Normally in the African context discussing sexual activity is a taboo.

There were chances of recall bias and social desirability bias. The control in this case was comparison with the pre-pregnancy state. Normally people tend to forget the number of times they had sexual intercourse or would misreport the frequency.

There were few clients attending antenatal clinic during the first trimester. The average gestation of starting antenatal clinic is about 5.9 months (35).

Some patients were not sure of their dates and therefore we had to rely on clinical assessment and where possible the use of an obstetric scan to estimate the dates. This could introduce inaccuracy.

Sexual orientation and positions were not researched in this study. This is because cultural constrains would have made the clients uncomfortable and therefore give inaccurate answers thus reduce the accuracy of the study.

The validity and reliability of the replies in sex research in general are problematic. Validation of data is possible when both members of the couple are separately interviewed and their replies collected for comparison. Furthermore, some questions asked neglect important basics of sexual and methodological knowledge and therefore one is bound to get a distorted answer; for instance, questions about orgasm are so heavily burdened with ideological discussions and norms that distortion of

answers has to be expected. In this study questions were framed in such a way that the answer was descriptive rather than a "yes" and "no" answer. For example, "How many times have you had sexual gratification this week? rather than "Do you get sexual gratification?" In this way bias was minimized.

Ethical Considerations

Approval to carry out the study was sought and obtained from the Ethical and Research Committee (ERC) at Kenyatta National Hospital.

Patients recruited into the study attended the normal routine of antenatal care follow-up. This study did not interfere with the follow-up protocol.

To ensure confidentiality names were not entered into the study questionnaire, but rather serial numbers for our research records. Clients were informed that refusal to participate in the study would not deny them routine care offered in the hospital.

The research results were used for the intended purpose only, that is, partial fulfilment of the masters of medicine degree in obstetrics and gynaecology of the University of Nairobi. However, it may be quoted or cited by any other interested parties anywhere in the world.

Informed consent was included in the study. This was obtained freely without coercion. The consent was translated into English, Kiswahili and Kikuyu to cater for all the clients. Copies of this consent are attatched in the Appendix.

Results

There were a total of 323 clients who took part in this study. This represents 88% of the calculated sample size. Most clients (>95%) answered all the questions asked. However, some clients did not respond to some of the questions asked for various reasons mostly due to not being armed with the exact information. Most (99%) of the questionnaires were administered by the researcher and the research assistants.

Socio-demographic Data

Table 1: Social demographic characteristics of clients participating in study

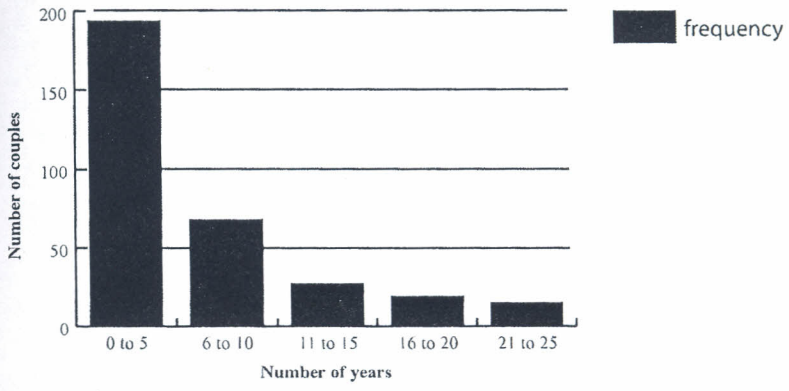
Characteristics	Number	%
Age (years) of client (mean 25.9 yrs)		
15 – 20	73	22.6
21 – 25	107	33.1
26 – 30	73	22.6
31 – 35	42	13.0
36 – 40	22	6.8
41 – 45	6	1.9
Total	**323**	**100.0**
Marital status		
Single and cohabiting	3	0.9
Married	313	96.9
Divorced/separated (and cohabiting)	7	2.2
Total	**323**	**100.0**
Age of spouse (mean 31.12 yrs)		
19 – 20	9	3.7
21 – 30	174	52.7
31 – 40	102	30.7
41 – 50	27	8.1
51 – 65	4	1.2
Unknown	5	1.5
Total	323	100.0

Characteristics	Number	%
Formal education level of the clients		
Illiterate	9	2.8
Primary school	198	61.3
Secondary and high school	110	34.1
Tertiary and University	6	1.9
Total	**323**	**100.0**
Number of children (parity of clients)		
0 - 2	273	85.8
3 - 5	41	12.9
>5	4	1.2
Total	**323**	**100.0**
Occupation of the clients		
Housewives	115	35.6
Farmers	127	39.3
Others	81	25.1
Total	**323**	**100.0**

The age of the clients participating in the study ranged between 15 to 45 years. Majority (33.1%) were young (21 to 25 years) with a median age of 25.0 and a mean age of 25.9 years (SD 6.32). The spouses of the clients taking part in the study were relatively older (19 to 65 years) with a mean 31.12 years and a median of 30 years (SD 7.54). Of the population taking part in the study most (96.9%) of the clients were married, the rest (3.1%) were either single, divorced or separated and cohabiting. Most (93.5%) of the clients were in a monogamous marriage while 3.7% were in a polygamous marriage and 2.8% did not know the type of relationship they were in.

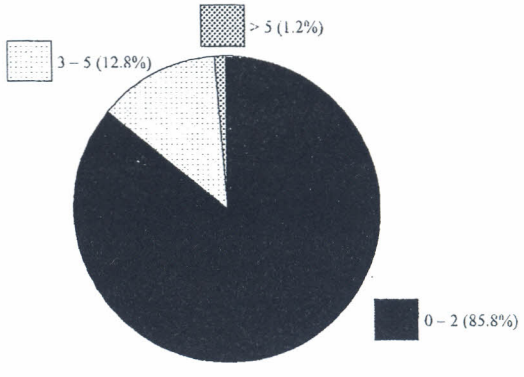
Of all women interviewed, 2.8% had no formal education, majority of them (61.3%) had attended primary school in various levels, 34.1% had attended secondary school and high school. Only 1.9% had attended tertiary education. These were divided into two broad groups for purposes of discussion; non formal education and primary education in one group and secondary education together with tertiary education in the other.

Fig 1: Duration of habitation by married couples



The median duration which the clients had lived with the spouse was 3 years (range 0.3–25 years)

Fig 2: Parity of clients participating in the study



The clients who participated in this study had a median parity of 1 (range 0–12). Of these women majority 85.8% were para 1–2 children. One client was para 12 gravida 13. Among these women 30% had unplanned pregnancies while majority (70%) had planned.

Socio-economically most of the clients were either housewives or farmers 35.6% and 39.3% respectively. The remainder of the women (25.1%) were either business women, hair dressers, teachers, nurses, students, accountants, casual labourers and secretaries.

Sexual history and activity

Table 2: Distribution of gestational age of clients

Trimester	number	%
1	28	8.7
2	106	32.8
3	189	58.5
Total	323	100.0

This table shows the distribution of clients over the three trimesters. Most (58.5%) of the clients recruited into the study were in the third trimester. The other clients were 8.7% and 32.8% in the first and second trimester respectively.

Table 3: Incidence of coitus per week in the prepregnancy state and that of the clients in the first, second and the third trimesters

Period	Incidence of coitus	Before pregnancy n (%)	During interview n (%)
First trimester (n=28)	0	0 (0.0)	6 (21.4)
	1 – 3	17 (60.7)	18 (64.3)
	4 – 7	9 (32.1)	3 (10.7)
	≥ 8	2 (7.1)	1 (3.6)
Second trimester (n=106)	0	0 (0.0)	11 (10.4)
	1 – 3	66 (62.3)	74 (69.8)
	4 – 7	35 (33.0)	21 (19.8)
	≥ 8	5 (4.7)	0 (0)
Third trimester (n=189)	0	0 (0.0)	61 (32.3)
	1 – 3	128 (67.7)	114 (60.3)
	4 – 7	51 (27.0)	13 (6.9)
	≥ 8	10 (5.3)	1 (0.5)

Table 3 shows the changes in coital sessions per week before pregnancy and during the first, second and third trimesters of pregnancy. In the first trimester prior to pregnancy the median coital sessions were 3 (range 1–14) per week compared to 1 (range 0–20). There were 2 outliers who had coitus 14 and 21 times per week. The figures above show a generalized reduction of coital activity in the first trimester of pregnancy. Majority (64.3%) of the clients had coitus 1–3 times per week in the first trimester. Some of the clients (21.4%) of the clients had no coitus in the week of interview.

In the second trimester the median coital sessions also decreased from 3 (range 1–21) to 2 (range 0–7) while comparing to the prepregnancy state. Majority (69.8%) of the clients had coitus 1–3 times per week in the second trimester. Of the clients 10.4% of the clients had no coitus in the week of interview.

The median sexual contact per week in the third trimester was 3 (range 1–21) prior to pregnancy but it reduced to a median of 1 (range 0–10). Majority (60.3%) of the clients had coitus 1–3 times per week in the second trimester. Of the clients 32.3% of the clients had no coitus in the week of interview. An outlier had coitus 21 times in that week.

The initiator of the coitus was mainly the spouse (41.2%) while the clients only initiated it 0.9% of the time. The rest of the time both initiated the coitus.

Table 4: Frequency of coitus(f) per week in all trimester compared to prepregnancy state

f	**Before pregnancy**	**At the time of interview**
	n (%)	**n (%)**
0	0 (0.0)	78 (24.1)
1 – 3	211 (65.3)	206 (63.8)
4 – 6	46 (14.2)	25 (7.7)
7 – 9	49 (15.2)	12 (3.7)
≥ 10	17 (5.3)	2 (0.6)
∑	**323 (100.0)**	**323 (100.0)**

(chi sqr = 21.32, p = <0.0001)

Table 4 shows the changes in coital sessions per week before pregnancy and during pregnancy. Before pregnancy the number of coital sessions that the clients reported had ranged between 1 to 21 per week (median 3). In the pregnacy state the number of coitus sessions was between 0 to 20 (median 1). This shows a generalised reduction in frequency form 3 to 1 when comparing the pre-pregnancy to the pregnancy state. During pregnancy, most (97.4%) of the clients had coitus 1–7 times per week.

Table 5: Changes in sexual desire in all the trimesters

Desire	**First trimester**	**Second trimester**	**Third trimester**	**Total (%)**
	no. (%)	**no. (%)**	**no. (%)**	**no. (%)**
Increased	5 (17.9)	22 (20.8)	6 (7.9)	33 (10.2)
Decreased	17 (60.7)	79 (74.5)	137 (72.5)	233 (72.4)
No change	6 (21.4)	4 (3.8)	46 (24.3)	55 (17.1)
Didn't know	0 (0.0)	1 (0.9)	0 (0.0)	1 (0.3)
Total	28 (8.7)	106 (32.8)	189 (58.5)	323 (100.0)

Sexual desire generally decreased. In this study population 72.4%, of the clients had reduced sexual desire, 10.2% had increased desire, 17.1% had no change in their sexual desire. One client (0.3%) did not know whether there was any change. This is supported by the fact that 41.2% of the clients had their spouses initiating the coitus while only 0.9% of the clients did initiate sexual activity with their spouses. However, 57.9% of the couples had either of them initiating sexual activity. From the figure above the sexual desire was reduced in all the trimesters. It was reduced in 60.7, 74.5 and 72.5 in the first second and third trimester respectively. It was increased in 17.9, 20.8 and 7.9 in the first second and third trimester respectively.

Table 6: Reasons for not having coitus in pregnancy all the trimesters

Reason	*f* (%)	Combination of factors	*f* (%)
Discomfort	62(19.2)	Discomfort and feeling tired	27(8.4)
Feeling tired	59 (18.3)	Discomfort and getting sick	12(3.7)
Feeling sick/getting sick	23 (7.1)	Discomfort and position	48(14.9)
Position does not allow	22 (6.8)	Discomfort and self image	6(1.9)
Don't look good (self image)	4 (1.2)	Feeling tired and getting sick	35(10.8)
Don't know	1 (0.3)	Gettng sick and self image	4(1.2)
Others (combination of factors)*	152 (47.1)	Discomfort,feeling tired, self image	30(9.3)

*The combination of factors were mainly those given above; for example worries on shape and discomfort, concerns of shape and getting tired, discomfort and alterations of position and pain, et cetera. These are described in detail in the second column of table above.

This was a multiresponse question. The most commonly cited reason for not engaging in coital activity was discomfort which was cited by most (68.3%) clients. This was cited singly by 19.2% of the clients and as a combination of many factors as shown above. This was followed by feeling tired which was cited by 18.3% of clients. Feeling and getting sick, uncomfortable position, and concerns of shape were mentioned by 12.7, 10.2, 2.5% respectively. Some of the reasons given in open discussion as a cause of not engaging in sexual activity were postcoital dysuria, vaginal discharge, the spouse refusing, advised by the doctor not to engage in sexual activity, fear of making the baby dirty, the spouse living far away from home and separation, the spouse being on treatment for a sexually transmitted disease, living together with the in-laws and fear of losing the baby. One client did not know why sexual activity had reduced.

Of the total population 71 (22.0%) did not report a reduction in sexual activity. However, there may be bias in this result as majority (58.5%) of the clients interviewed were in the third trimester. The linear correlation between the age of the clients and frequency of coitus, and parity and frequency of coitus age of spouse and frequency of coitus was r = -0.05, r = -0.026 and r = -0.007 respectively. This is a non-significant negative linear correlations (p>0.05).

Table 7: Frequency of sexual gratification, presence of pain and abdominal discomfort during sexual activity in all the trimesters

Response		Sexual gratification	Dysparunia	Abdominal discomfort
Present:	Always	241 (74.6%)	17 (5.3%)	10 (3.1%)
	Sometimes	76 (23.5%)	56 (17.3%)	85 (26.4%)
Absent		6 (1.9%)	250 (77.4%)	227 (70.5%)
Total		323(100.0%)	323(100.0%)	323(100.0%)

Sexual gratification was achieved by most (91.1%) of the clients participating in the study. Of these 74.6% always had sexaual gratification during intercourse and 23.5% occasionally had gratification. 6% of the clients participating in the study did not attain any sexual gratification. Few of the clients (5.3%) always experienced abdominal pain during coitus while 17.3% did experience pain sometimes. 3.1% of the clients always experienced abdominal discomfort while 26.4% of the clients did experience abdominal discomfort sometimes. This could explain the reason why sexual activity, desire and gratification were reduced. However of the clients participating in the study 77.4% and 70.5% never experienced dyspareunia or abdominal discomfort respectively.

Of the clients participating in the study 27.6% knew their HIV status. Out of these 0.9% were HIV-positive while 26.6% were HIV-negative. The rest (72.4%) did not know their HIV status. Of these HIV-positive clients 66.7% used barrier

methods regularly during coitus. However 33.3% did not use the barrier on a regular basis. This is important as this is one of the major ways in which the human immunodeficiency virus is transmitted. In the study we did not ask the spouses HIV status as this did not constitute part of the study objectives.

Patients concerns and practices

Table 8a: Clients practices and concerns on discussing sexuality and sexual activity with someone else (percentage in parenthesis)

		Person to discussed with		
		Health-care provider (p=0.004)	**Spouce (p=0.96)**	**Friends (p=0.05)**
Wished to discuss	Yes	270 (83.8)	309 (95.6)	240 (74.2)
	No	53 (16.2)	14 (4.4)	83 (25.8)
Discussed	Yes	216 (66.8)	306 (94.7)	239 (74.0)
	No	107 (33.2)	17 (5.3)	84 (26.1)

Table 8b: Reasons why clients did not discuss sexuality and sexual activity with someone else (percentage of the total population in parenthesis)

	Person to discussed with		
	Health-care provider	**Spouce**	**Friends**
Fear	13 (4.0)	5 (1.5)	55 (17.3)
Cultural constrains	1 (0.3)	2 (0.6)	4 (1.2)
Unsure	35 (10.8)	5 (1.5)	22 (6.8)
Others	4 (1.1)	2 (0.8)	2 (0.5)
Total	53 (16.2)	14 (4.4)	83 (25.8)

From the *table 8a* above we see that 83.8% of the clients had always or sometimes wished to discuss the topic of sexuality and sexual activity with their health care providers but only 66.8% had actually discussed once or more times. There was a statistical difference between those clients who wished to discuss the topic of sexuality and sexual activity and those who actually did. The reasons given for not wishing to discuss this topic *table 8b* were fear, cultural constrains and unsure or unknown reasons in 4%, 0.3%, 10.8% respectively. Other clients (1.1%) stated that the Health-care providers were not interested in discussing the topic at all with the clients. Of the clients 96.4% had wished to discuss this topic with their spouses on one or several occasions but of these 94.7% had managed to do this, 16.8% had discussed it once and 77.9% had discussed it more than once. Fear and cultural constrains were cited as the reasons in 1.5% and 0.6% respectively. Other clients (0.8%) stated that they were shy or their spouses were not interested in discussing the topic. The clients had less enthusiasm in wishing to discussing this topic with their friends. 74.2% of the clients had wished to discuss this topic once or severally with their friends. Of these 73.9% had actually discussed it with their friends. Reasons given for these clients not discussing this topic with their friends are similar to the others with an additional one being lack of trust.

As discussed above 64.1% of the clients taking part in the study had none to primary school form of formal education, while the rest 35.9% had secondary school education and beyond. The relation between the level of education and the clients wish to discuss sexuality was not significant ($p=0.96$).

Of all the clients interviewed 97.8% of the clients were quite comfortable discussing this topic. Only 0.6% said they were not comfortable. The rest 1.6% were not sure.

Patients knowledge

Table 9: Frequencty of distribtuion of fear of pregnancy loss during coitus

Fear of pregnancy loss		Frequency	%
Present	always	32	9.9
	sometimes	52	16.1
Absent		239	74.0
Total		323	100.0

Most (74%) of the clients said that there is no risk of loss of pregnancy due to sexual activity. However 26% of the clients believed that sexual activity was associated with pregnancy loss; of these 9.9% always had the fear of pregnancy but only 16.1% thought that the loss was sporadic. The relationship between the level of education and the clients fear of the loss of the pregnancy during sexual activity was not statistically significant ($p = 0.29$).

Table 10: Responses of whether frequency should increase, decrease or stop in pregnancy. (Figures in %)

Response	yes	no	sometimes	don't know	Total
Increase	6.5	78.9	6.5	8.0	100
Decrease	15.5	10.8	67.4	9.0	100
Stopped	8.7	42.7	44.7	3.7	100

Most (78.9%) of the client did not believe that sexual activity should be increased in pregnancy. However 6.5% of the respondents felt that sexual activity should be increased. No reason was given for this. Those who believed that sexual activity should be reduced mainly said that it should be reduced sometimes (67.4%). However, 15% agreed that it should be decreased fully while 10% of the respondent did not agree that sexual activity should be reduced. Eight percent and 9% or the respondents did not know whether sexual activity should be increased or decreased respectively. 42.7% responded that sexual activity should continue in pregnancy

while 44.7% responded that it should be stopped sometimes. Of the respondents 8.7% said that sexual activity should cease and 3.7% were not sure. The relationship between the level of education and the clients thoughts that sexual activity should either be increased, decreased or stopped all together were not statistically significant.

Table 11: The clients (n=323) perception on the effects of sexual activity (figures in %)

Response	yes	no	sometimes	don't know	Total
harms client	17.3	74.6	2.2	5.9	100
harms the spouse	4.0	90.1	0.3	5.6	100
harms the fetus	14.9	71.5	1.5	12.1	100
causes preterm deliver	18.0	72.8	0.9	8.4	100
increases pregnancy loses	16.1	76.8	1.5	5.6	100
widens vagina	29.0	48.0	0.9	22.1	100

From the table and graph above over 70% clients answered no to majority of the questions. However 29% had the misconception that sexual activity actually does widen the vagina, while 48% answered on the negative, and 22.1% did not know the effects of sexual activity on the vagina. 14.9% thought that sexual activity harms the fetus while 12.1% did not know what effect sexual activity had on the fetus. In general most clients were quite knowledgable on the effects of sexual activity on themselves, the fetus and their spouses.

Table 12: The relationship between formal education and the response that sexual activity causes early delivery

	Response (%) on sexuality causing early delivery				
Education level	**Yes**	**No**	**Sometimes**	**Don't know**	**Total**
Non + Primary	16.9	78.3	0.5	4.3	64.1
Secondary and over	19.8	62.9	1.7	15.5	35.9
Total	18.0	72.8	0.9	8.4	100.0

p = 0.0017, chi = 15.1

The relationship between the two major groupings of the level of education and the clients fear that sexual activity does cause early delivery was statistically significant and that of pregnancy loss was not statistically significant (chi square = 15.08, p = 0.001 and chi=10.77 and p= 0.113 respectively).

Most (86.4%) of the clients did report having an illness and were on some medication. Amongst the common conditions were upper respiratory tract infection, malaria, vomiting, candidiasis and urinary tract infection, heart burn. Other conditions mentioned were epilepsy, chronic hypertension, PET, diabetes, HIV-TB. All these conditions were being managed accodingly. However sexual activity did continue as seen from the analysis above

Discussion

In this study involving 323 took part in the study. Majority (81.3%) of clients were in the second and third trimesters. This could be attributed to the fact that most clients start/attend antenatal clinics in the second and third trimester (the median gestation at first antenatal visit is 5.9 months in the rural areas) (36). The clients were of young age (21 to 25 years) with a mean age of 25.9 years (SD 6.32). This is consistent with the peak age of delivery in Kenya which is 25–39 years (36).

According to the results in this study there is a reduction in the frequency of coitus throughout pregnancy from a median of 3 in the prepregnancy state to one per week. This was, however, more in the first and third trimesters where the median frequency of coitus per week was 1 while that of the second trimester was 2 as compared to the prepregnancy state where the median frequency was 3. This concurs with the studies in Thiland which showed vaginal coitus does actually diminish in all the trimesters of pregnancy in most couples but with minor variations in some couples (15,37). This may be expained by the fact that women usually adapt for many changes such as physiological changes, body image or life style. This changes may affect their sexuality and sexual activities. As in this study, some studies show that the trimester of pregnancy being an predictor of coital frequency during pregnancy (20,39).

There was a generalized reduction in sexual desire in all the three trimesters in this study where 72.4% of the respondents had a reduced sexual desire. Studies elsewhere show that the sexual desire, arousal and orgasmic potential are decreased during pregnancy as compared to the prepregnancy state (15,35,38). The study found that the pregnant women rarely initiated coitus (0.9%). This further supports the fact that the desire is reduced. Other studies show that the female desire in pregnancy is unchanged or slightly decreased in the first trimester and decreases sharply at the end of the second and third trimester (27).

There was a decrease in orgasm/sexual gratification as noted in this study, which found that sexual orgasm was achived by 74.6% corresponding to the findings in other studies (28,38). There is a decrease in orgasmic frequency during pregnancy in all the trimesters where 29.5% did not achieve orgasm. This is similar to studies

carried out in Thiland. This may also explain the reduction in sexual desire as there would be less chances of sexual gratification. Some studies, however contradict this as they found increased sexual desire and enjoyment during the second trimester resulting from the congestion of pelvic vasculature (37).

The study showed that most (78.9%) of the client did not believe that sexual activity should be increased in pregnancy while 6.5% of the respondents felt that it should be increased. Some communities such as the Hindus and Swedis encouraged sexual activity in pregnancy (1).

In this study it was found that 83.8% of the women wished to discuss the topic with their health care provider but only 66.8% had ever done it. However, in this study found that the spouse did play a major role in the clients knowledge source as most (95.6%) of them had discussed this topic with them. The depth at which this topic had been discussed remains unknown. The information source regarding sexual activity in pregnancy was generally not derived from the health care providers and friends. From figures the result section it can be deduced that more clients discussed this topic with their spouses than they did with friends and Health-care providers. This is similar to research carried out elsewhere which showed that less that 25% of the women received this information from their health care provider but mainly from books (38). Fear and cultural constrains were the main factors for failure of discussing this topic with the health care providers. Similar results were found in Thailand where culture and religious constrains (39) were prominent causes of shying away from the topic.

From the results 17.3% of the respondents believed that coitus in pregnacy can harm the client, 14.9% believed it can harm the fetus, 18% believd it can cause preterm delivery, and 29% believed it can widen the vagina. This concurs with studies carried out in Canada which showed that many women have concern over sexual activity causing obstetric complications or harm to the fetus (4,38). In Nigeria coitus is believed to cause still births, preterm labor and perinatal mortality (. There is, therefore, a significant number of women with misconceptions regarding sexual activity in pregnancy. It is worring that even educated respondents in the study seem

to have misconceptions about sexual activity causing early delivery as seen in the study where a statistically significant relationship between the level of education and the clients fear that sexual activity causing early delivery (chi square = 15.08, p = 0.001). This is similar to the study carried out in Nigeria as described above (35). However, there is no reason to proscribe sexual activity to the majority of healthy pregnant women and their partners, even in the last weeks before the birth.

Conclusion

Sexuality and sexual activity were reduced signifiantly in pregnancy. This study interviewed clients in all the three trimesters giving a good overview of the sexual activity occuring in these trimesters. It also had depicted the clients concerns and fears associated with sexual activity in pregnancy.

Over 90% of the clients were married and therefore it can be said that most would have had regular sexual activity. However it was noted that there was a generalized reduction in sexual activity and sexual desire in all the trimesters.

Although duscussing the subject of coitus and sexuality in most cultures and expecially that of African communities this study was quite enlighting in that most clients were found to be quite comfortable in discussing these topics and were actually concerned that healthcare providers never introduced this topic as part of their antenatal care health talks.

Recommendations

1. The issue of HIV/AIDS was not addressed in this study. A comprehensive study into sexuality and sexual activity among HIV infected gravid clients needs to be looked into so as to minimise the infection rates among the clients and for prevention of mother to child transmision of HIV.

2. This study did not investigate the position/orientation during sexual intercouse. This would be an area of good study especially due to the anatomical changes that occur during pregnancy.

3. This study did not take into consiseration the male partner's concerns, beliefs and expectations during their spouces antenatal period. Sexual activity among the spouses of antenatal clients needs to be studied so that better understanding of the topic from both perspectives.

4. Doctors can provide key information to couples regarding physiological, physical and psychological changes occurring during pregnancy therefore disseminating knowledge on the normal fluctuations in sexual requirements in men and women, especially during the pregnancy state. It is therefore important to disseminate this knowledge of sexuality and sexual activity to doctors and health care providers during their training period. It is important for the clients to understand this topic to minimise anxiety on behalf of the woman and her partner.

5. It is improtant that medical health providers advice the clients that sexual activity does not cause complications to the pregnancy. Health care providers should play a major role in bringing up this topic in a friendly manner during the antenatal care visits so as to demystify the topic.

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Case 1: Pelvic abscess – Laparotomy and drainage

Name	: H.K.	**Date of admission**	: 30 May. 2005
Age	: 38 years	**Date of discharge**	: 4 Jun. 2005
I.P. No.:	1028181		

Presenting complaints

She was admitted via casualty with complaints of lower abdominal pains and par vaginal bloody foul discharge for a duration of 10 days. She also complained of vomiting and hotness of the body for 3 days.

History of presenting complaint

She had induced an abortion at 13 weeks gestation in a private clinic 10 days prior to admission. She reported fetal expulsion she continued bleeding per vaginally with the foul discharge developing 3 days prior. The discharge had been accompanied by low abdominal pains. The abdominal pains worsened on the day of admission making it impossible for her to walk. Three days prior to admission, she had started vomiting and this worsened on the day of admission. She also experienced hotness of the body for 3 days prior to admission.

Obstetric and gynaecological history

The patient had attained her menarche at the age of 17 years. Her menses were regular every 26 days and a flow lasting for 4 days. She was a para 1+1. Her last delivery was in 1999. In 2000, she induced an abortion in a clinic through dilatation and curettage. Her last menstrual period was on 21.2.2005. By the time of abortion, she had a period of ammenorrhea of 13 weeks. She had never used any form of contraception.

Past medical history: She had been treated for PTB in 2004.

Family and social history

She was the first born in in family of 5 siblings. All the other members of her family lived in Meru. She was a single lady and made her living by hawking kitchen ware. She occasionally consumed alcohol but never smoked. There was no family history of chronic illness.

General examination

She was found to be sick looking patient distressed by pain, moderately dehydrated, not

jaundiced, not pale, not cyanosed, had no oedema or peripheral lymphadenopathy. Her vital signs were, temperature 38°C, blood pressure 100/60 mmHg, pulse rate 100/minute and respiratory rate of 26/minute.

Central nervous, respiratory and cardiovascular systems were essentially normal.

Abdominal examination

The abdomen was distended, it was diffusely tender, with guarding and with rebound tenderness. Due to the diffuse tenderness it was not possible to palpate for organomegaly or any masses. The bowel sound were heard and normal.

Pelvic examination

The external genitalia appeared normal. The vaginal walls felt normal, cervix was about 1 cm long, closed and the uterus was bulky. There was a boggy feeling at the pouch of Douglas, adnexae felt free but tender. Cervical excitation was positive bilaterally. The examination of gloves revealed an offensive blood coloured discharge.

Impression

An impression of postabortal sepsis with pelvic abscess was made.

Management

The patient was planned for an urgent pelvic ultrasound scan which confirmed the diagnosis. The patient was planned for laparotomy and drainage. It was explained to her of the diagnosis and plan and management of the procedures. A consent was obtained, intravenous fluids were commenced to correct the dehydration in form of Hartman's solution. Intravenous crystalline penicillin and metronidazole were also commenced. Intramuscular acetylsaliclic acid was given as analgesic and anti pyretic.

Blood was also taken for:

1. Hemogram: Hb 10.0 g/dl; WBC 17.2 x 10^9/l (N=75%, L=22%, E=2%); Plat 205.
2. Urea 12.4mmol/l, creatinine 88µmol/l, and electrolytes Na+ 134mmol/l, K+ 3.5mmol/l
3. A rapid test for HIV was reactive.

Her blood was grouped and cross-matched and 2 units of blood was obtained. She was pre-medicated with atropine intramuscular 0.6mg and pethidine 100mg half hour before theatre. She was then wheeled to the operating room.

Laparotomy and drainage

In the operating room, the patient was placed in supine position and general anaesthesia administered. She was then put in semi-lithotomy position and vulvo-vaginal toilet done. The bladder was catheterised and about 100mls of clear urine drained. The patient was then repositioned to supine position and the abdomen cleaned then draped. Through a low midline incision, the abdomen was opened in layers. The parietal peritoneum was thick and edematous. The bowels were matted together and adherent to parietal peritoneum. Through blunt dissection, the adhesions were released. There was a thick pus collection in both paracolic gutters and in the pouch of Douglas. A specimen of the pus was collected for microscopy and culture with antibiotic sensitivity.

The pus was drained by vacuum suction (2 litres). The distal omentum was found necrotic and was resected. The gut was inspected and found viable and patent. The uterus and adnexae were inspected. The uterus was found intact, tubes were bilaterally identified but found to be inflamed. Peritoneal lavarge was done with rifocine. Two corrugated drains were left in-situ, one in each of the paracolic gutters. Hemostasis was ascertained and verification of swabs and instrument count.

The drains were anchored using Nylon 2/0. Mass closure of the abdomen was then carried out using nylon loop No. 1. The skin was closed using nylon No. 2/0. The estimated blood loss was 200mls.

Post-operative care

The reversal from general anaesthesia successful. She was stable and extubated. She remained stable and was transferred to the ward. On the second postoperative day she was sick looking but stable The drains output was 200 ml in 24 hours. She was commenced on oral sips physiotherapy for ambulation. She was already on intravenous cefuroxime 1.5g per day and metronidazole 1.5g per day. She continued making good recovery and was ambulant on 4th postoperative day. The drains were dry and were removed 5th postop day. On her ninth post-operative day, the stitches were removed but the wound slightly septic. Dressing was carried out daily, and on 14th postoperative day, the wound was clean and dry and the patient was discharged through family planning clinic, the comprehensive care clinic and to come for review in gynaecology clinic after 6 weeks. The pus result was not in the file by the time of discharge.

Discussion

Pelvic abscess is a collection of pus that may be confined to tube (pyosalpinx), or involve the tube and the ovary (tubo-ovarian abscess), or may lie between the leaves of the broad ligament (broad ligament abscess). Pus may collect in the pouch of Douglas (cul-de-sac abscess) where it is usually walled off superiorly by intestinal loops and omentum, while its inferior surface dissects between rectum and vagina. A pure ovarian abscess is rare. Frequently, abscess formation is found at more than one anatomical site. The infection is usually bilateral (1,2).

The incidence of pelvic abscess varies from region to region due to the different management of the predisposing factors. Majority of the pelvic abscess patients are between 20 and 40 years of age (1). The patient presented was 38 years. Pelvic abscess may occur as a sequelae to acute pelvic inflammatory disease, postabortal or puerperal sepsis (2,3). Fomulu found that 18.2% of abortions were complicated by pelvic abscess (4). Chebrot showed that 13% of the patients with pelvic abscess had attempted abortion with crude contaminated methods (5). Other causes of pelvic abscesses are acute salphingitis, perforation of the uterus, infection of pelvic hematoceles usually following disrupted tubal pregnancy, postoperative pelvic peritonitis following abdominal or vaginal operations, and irritant peritonitis following contamination by urine, vermix carseosa, meconium spilled during Caesarean section among others. Extrapelvic causes of pelvic abscess are rare but include appendicitis, diverticulitis or generalized peritonitis. H.K. developed a pelvic abscess secondary to postabortal sepsis.

Pelvic abscess is frequently associated with multiple organisms such as gonococcus, anaerobic species and especially bacteroides. The incidence of acute pelvic inflammatory disease (PID) decreases with advancing age. Adolescent females are at risk of developing acute salphingitis (6). The 2 most incriminated pathogens of PID, *Neisseria gonorrhoea* and *Chlamydia trachomatis* which have a predilection for columnar epithelium of the cervix. Gonorrhoea is often cultured during the first 24 to 48 hours of PID but is often absent later. In late disease, anaerobic bacteria such as prevotella, bacteroides, peptococcus and peptostreptococcus tend to dominate (2,3,7). Actinomycoses is usually incriminated in tubo-ovarian abscesses associated with an intrauterine device (3,7,8). The scenario above has been demonstrated at Kenyatta National Hospital (KNH). Gonococcus was present in 75% of patients with acute pelvic inflammatory disease (PID) but only in 4% of those with pelvic abscess (2,9).

Patients normally present with complaints of fever, vomiting, low abdominal pains and foul smelling vaginal discharge. They may also present with dysuria, frequency or painful defecation (1,2,3,9). The patient presented here had fever, vomiting, low abdominal pains and vaginal discharge that had an offensive odour. Examination normally reveals febrile sickly patients, distended abdomen that is acutely tender with rebound tenderness. On vaginal examination there is acute tenderness exacerbated by movement of cervix and swelling that may be felt beside the uterus or in the pouch of Douglas. The tender uterus feels enlarged and presence of offensive vaginal discharge (1,2,3,9). H.K. had the signs described above.

Laboratory investigation will usually confirmatory. Generally the clinical picture is usually sufficient to diagnose a pelvic abscess. The blood picture is similar to that of acute PID; showing elevated WBC, elevated ESR, elevated C-reactive proteins and there may be evidence to the causative bacteria in endocervical smear (3). Ultrasound, CT scan or MRI scan may be used to assess the size of the abscess or for follow up during treatment (1,2,3). Laparoscopy may be diagnostic and curative (3,10). The differential diagnosis include periappendicular abscess, ectopic pregnancy, ovarian neoplasm, uterine leiomyoma, retroflexed and incarcerated uterus, endometriosis, carcinomatosis and diverticulitis with perforation (1, 2,3).

Fluid and electrolytes, which maybe deranged are managed with intravenous fluids or via central lines in case of septic shock. Output should always be maintained. (2,3). H.K. was started on intravenous fluids on admission. Antibiotic therapy is employed using empirical regimes directed at the expected pathogens, usually a penicillin, an aminoglycoside and a drug specific for bacteroides. This regimen may be modified when the results of endocervical, blood and cul-de-sac cultures are available (1,2,3).

Some abscesses respond to the above conservative management, that is, antibiotic therapy. Failure of conservative therapy is indicated by persistent, fever, increase in size of the pelvic mass, or spreading level of peritonitis. Failure is usually evident within 48–72 hours of admission. Immediate surgery is indicated if intraperitoneal rupture is suspected or if the diagnosis is uncertain (1,2,3,9).

Surgery is the mainstay of treatment of pelvic abscess (3,9,11). The surgical approaches are open laparotomy, posterior colpotomy and laparoscopy (3). During laparotomy, the

bowels should be packed off before the pelvic dissection commences. Intraoperative lavage is essential to minimise the danger of post-operative reaccumulation of subphrenic or pelvic purulent collectors. Drainage following the procedure is usually via the vaginal cuff or flank drains (1,3). In the patient presented 2 flank drains were left. Posterior colpotomy drainage is sometimes done for pelvic abscesses pointing into the vagina. There are 3 requirements for posterior colpotomy drainage of a pelvic abscess: (i) The abscess must be midline or nearly so, (ii) the abscess should be adherent to the cul-de-sac peritoneum and should dissect the rectovaginal septum to assure the surgeon that drainage will be extraperitoneal and that pus will not be disseminated transperitoneally, and (iii) the abscess should be cystic or fluctuant to ensure adequate drainage (1,3,8). The role of laparoscopoic management of pelvic abscesses should be left to the experienced surgeons, and with the patient's full understanding of other options available (3,9). Percutaneous drainage of pelvic abscesses under ultrasonographic or CT scan has been attempted with success in 70–90% of the cases (12).

A tuboovarian or pelvic abscess can rupture into the rectum, bladder (rare, only found in the elderly), or into the peritoneum leading into generalized peritonitis or septicemia. Management of the first two is by conservative management while the last is by emergency laparotomy (3). The immediate complications of pelvic abscess include, septic shock, acidosis, anuria, pulmonary embolism and thrombophlebitis. Late complications include chronic ill health, pelvic pain, dysmenorrhoea, dyspareunia, bowel obstruction, infertility and ectopic pregnancy (3,13).

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Case 2: Ruptured left isthmal ectopic pregnancy – left salphingectomy

Name : M.B. **Date of admission** : 7 Jul. 2005
Age : 25 years **Date of discharge** : 14 Jul. 2005
I.P. No.: 1036712

Presenting complaints

The patient presented with acute onset lower abdominal pain for 3 days, dizziness and weakness for about 5 hours prior to admission.

History of presenting complaint

The patient was well then started experiencing the pain, which was increasing in intensity over the past 1 day. There was accompanying dizziness and weakness. There was left shoulder pain which was worse on inspiration. There was no associated vomiting and her bowel habits were normal. She had no history of being treated for a sexually transmitted infection.

Obstetrics and gynaecology history

She was a para 0+0 G1, her LMP was on 26 May 2005, and therefore she had amenorrhoea of about 6 weeks. She had her menarche at 14 years. The cycle was every 28 days and lasted 3 days and was regular. She had never used contraceptives.

Past medical history was unremarkable.

Family and social history

She was a married homemaker who lived with her spouse. She did not smoke nor take alcohol. There was no history of chronic illness in the family.

Physical examination

On examination she was sick looking, anxious and restless. She was markedly pale, had no lynphadenopathy, jaundice, cyanosis or oedema. The vital signs were a respiratory rate was 24/min, BP was 100/60mmHg, pulse was 100/min, and temperature was 36.4°C.

The respiratory cardiovascular and central nervous systems were essentially normal.

Abdominal examination

There was generalized abdominal pain with rebound tenderness and guarding. The bowel sounds were reduced. There was no hepatosplenomegally.

Pelvic examination

She had a normal external genitalia, the cervix was posterior closed, cervical excitation test was positive, the adnexa and pouch of Douglas were full and tender bilaterally. There was a bloody discharge on examining finger.

Impression

An impression of a ruptured right ectopic pregnancy was made. A differential diagnosis of twisted ovarian cyst was entertained.

Investigations

Culdocentesis was positive for non-clotting blood.

Management

The patient was prepared for emergency laparotomy. The patient was informed of the diagnosis and mode of management. Informed consent was obtained. A blood sample was taken for group and cross match. Premedication IM atropine 0.6mg ½ hour before theatre was given.

Procedure in theatre

At laparotomy, a haemoperitoneum of 1600 mls of blood was found with a ruptured left isthmal ectopic pregnancy. A left salphingectomy was done and hemostasis was achieved. The specimen was taken for histology. The right tube and ovary were inspected and were grossly normal. The left ovary was healthy there were adhesions seen over the fundus of the uterus. The uterus was bulky. The appendix was normal and healthy. The abdomen was cleaned with warm saline and closed in layers after confirmation of correct swab and instrument count. Anaesthesia was reversed successfully. Post operatively recovery was unremarkable. A check Hb done on the third postoperative day showed an Hb level of 7.5g/dl. She was discharged home on the 7th postoperative day on haematinics and asked to come to the gynaecology outpatient clinic in 2 weeks for checkup. At review in two weeks the patient was doing well and the wound was well healed.

Discussion

Implantation of the blastocyst anywhere else apart from the endometrial lining the uterine cavity results in an ectopic pregnancy. The first described ectopic was in an English cadavar in 1693. More than 95% of ectopic pregnancy involve the fallopian tube. The incidence in the United States is 19.7 per 1000 pregnancies (1). The risk of death from an extrauterine pregnancy is 10 times greater than that of a vaginal delivery and 50 times greater than for induced abortion. Moreover prognosis for a successful subsequent pregnancy is reduced significantly in the women, especially if they are primigravida and over 30 years. With early diagnosis, both maternal survival and conservation of reproductive capacity are enhanced. Ectopic pregnancy remains the second leading cause of maternal mortality in the U.S.A., and is the leading cause of maternal mortality in the first trimester (1).

The locations of ectopic gestation are either said to be extrauterine comprising 98.5% of the cases and uterine comprising 1.5% of the cases. The uterine ectopic gestations may either be cervical, angular or cornual (1,2). Generally the other locations are:

1. Tubal pregnancies account for 99% of all the ectopic pregnancies (this are distributed as: ampullary 55%, Isthmic 25%, Fimbrial 17%, interstitial 2%).

2. Ovarian pregnancy account for <0.5% (may be ovarian, tubo-ovarian, abdomino-ovarian)

3. Abdominal pregnancies account for <0.1% (classified as primary, secondary, abdomino-ovarian, tubo-abdominal). The primary abdominal pregnancy is extremely rare. The secondary abdominal pregnancies are further classiffied as intraperitoneal which is more common than the extraperitoneal (or broad ligament) pregnancy.

4. Compound or heterotropic 1 in 17000-30000 pregnancies (these are combined with intrauterine pregnancy)

5. Cervical which are extremely rare (may be intraligamentous, cervical stump following hysterectomy

6. Abnormal placement in the uterus (may be cornual, angular, within uterine diverticulum, rudimentary horn, intramural. (2,3,4)

Ectopic pregnancy commonly occurs in women with impaired tubal function (5). The most important risk factors identified are: tubal scarring due to infections, previous tubal surgery, tubal sterilization, previous ectopic pregnancy, in utero exposure to diethylstlboestrol, use of intrauterine device, progestin only contraceptives, assisted reproductive technologies, documented tubal pathology, infertility, previous genital infections, multiple sex partners, previous pelvic or abdominal surgery, cigarette smoking, vaginal douching, early age at first intercourse (<18yrs) (1,5,6,7). Surgically visualized tubal pathology, commonly resulting from pelvic infection, endometriosis, or previous surgery is the strongest risk factor (1,6). Pelvic infections, including gonorrhoea, serologically confirmed chlamydia infection, and pelvic inflammatory disease, are surprisingly less significant (6,8,9). The risk is increased in women who have had ectopic pregnancy previously (the chance of having a repeat ectopic pregnancy is 10–15%), and increases further in proportion to the number of ectopic pregnancies. Risk of recurrence decreases with subsequent intrauterine pregnancies after the initial ectopic pregnancy (9,10). Assisted reproductive technologies (ART) does contribute to the risk of ectopic gestation. Tubal pregnancy is increased following ovulation induction and in vitro fertilization and embro transfer (IVF-ET), and gamete intra-fallopian transfer (GIFT) procedures. The ART procedures increase the risk of ectopic gestation by 5–7%. M.B. was a primigravida, with no obvious history of infection. Intraoperatively, there was no obvious pathology visible. The cause of ectopic could have been due to functional factors in the tube or previous pelvic infection.

Factors that facilitate nidation in the tube are (i) early resumption of the trophoblastic activity probably due to premature degeneration of the zona pellucida, (ii) increased decidual reaction, and (iii) tubal endometriosis.

Abdominal pain with amenorrhoea and/or with uterine bleeding is the most common (classical) presenting complaint (11,12). However a high index of suspicion is important in diagnosing ectopics as only 14% with the classical symptoms have ectopic gestation. These symptoms are less predictive in early gestations and may only show in case of rupture. Diagnosis is made from history, physical examination and laboratory data such as serial beta hCG measurements. Ultrasound is invaluable in terms of diagnosis. This can either be transabdominal or transvaginal ultrasonography. In case of

suspected rupture paracentesis or culdocentesis yielding, non-clotting blood is usually confirmatory. In case of non-ruptured ectopic pregnancy laparoscopy remains the gold standard for diagnosis (1,11). Serum levels of progesterone <5 ng/ml together with abnormal ßhCG have almost 100% predictive of ectopic pregnancy (1). Other potential diagnostic aids are dilation and curretage, hysterography and selected salphingography, falloposcopy and magnetic resonance imaging (1,11,13)

The natural history of an ectopic pregnancy suggests a number of tubal pregnancies can resolve within 20 ± 13 days without treatment. As high as 18–20% of tubal pregnancies may terminate into spontaneous absorption (1,12). However, for spontaneous resolution to occur the initial ßhCG has to be <1000 IU/L with reducing subsequent titres, hemoperitonium has to be <50 ml and hematosalphinx <2 cm (1). Non-surgical methods of treatment such as use of systemic or local injection of methotrexate are available and indicated usually in non-ruptured ectopic pregnancy (14). Methotraxate has also been used for persistent ectopic pregnancy after tube conserving surgical procedures with subsequent proliferation of trophoblastic tissue (1). Methotrexate therapy has emerged as an alternative; this approach has similar efficacy to laparoscopic surgery but is less costly (15).

Surgery is the preferred treatment of ectopic pregnancy when there is rupture hypotension, anaemia, or persisting pain beyond 24 hours (13). In our unit laparotomy is the preferred method. Surgical modalities available are either laparoscopic or open laparotomy. In either one can conduct a conservative surgical treatment by performing linear salphigotomy or segmental resection. Radical surgical treatment is performed by ether partial or complete salphingectomy (1,2). The surgical approach has long been evolving toward laparoscopy, which is less expensive (13).

The cervical ectopic is rare but harzadous because of the associated bleeding due to trophoblastic tissue invading the uterine blood supply. The criteria for diagnosis is based on 8 factors: (i) cervical glands must be opposite the placental attachment, (ii) placental attachment to the cervix must be situated below the entrance of the uterine vessels or below the peritoneal reflection of the anterior and posterior surfaces of the uterus, (iii) fetal elements must be absent from the corpus uteri, (iv) the is uterine bleeding without

cramping pain following a period of ammenorrhea, (v) a soft, enlarged cervix equal to or larger than fundus (hour glass uterus), (vi) products of conception are entirely confined within and firmly attached to the endocervix, (vii) a closed internal cervical os, and (viii) a partially opened external os. The treatment is usually by abdominal hysterectomy. Methotraxate treatment may be considered as an adjuvant to surgery (1).

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Case 3: Genital prolapse – total vaginal hysterectomy

Name : J.M.	**Date of admission**	:	26 Jun. 2004
Age : 70 years	**Date of discharge**	:	10 Jul. 2004
I.P. No.: 45784/04	**Parity**	:	7 + 0

Presenting complaints

This patients first contact was in the gynaecology outpatient clinic in Kerugoya District Hospital where she had been referred from a peripheral health centre. She presented with:

1. Protruding vaginal mass for 6 months.
2. Par vaginal spotting for 1 week.
3. Lower abdominal pain for 1 week

History Presenting illness

The pink mass had progressively protruded from the introitus. Initially intermittently but at the presenting time was protruded all the time. It (mass) became prominent with Valsalva manoeuvre. One week prior to presenting the patient had experienced spotting on two occasions from the mass. This had resolved spontaneously but she complained that the mass felt very dry to touch. There was no par vaginal discharge.

Micturition habits had not changed. There was no incontinence, no dysuria, no haematuria nor feeling of incomplete bladder emptying. Bowel habits were also normal. Continence was normal.

The back pain was intermittent and not severe. It was situated at the lower back. This pain was worse on bending. There was no reported swellings of the back or weakness of the lower limbs or changes in sensation caudally. The pain was relieved by analgesics.

There was no history of present or past abdominal swelling, no chronic cough, no trauma to the back.

Past medical and surgical history

She had had a laparotomy in 1967 in Nyeri for an abdominal mass. She was transfused 2 units of blood after the laparotomy. Records for this were unavailable.

She had been admitted for par vaginal bleeding in 1970. This was managed parentral medication. However, she had not been on any medication chronically.

Obstetric and Gynaecological History

She is para 7 + 0 with 7 living children. She was post menopausal for about 20 years. All her deliveries were by spontaneous vertex delivery. There was no history of assisted vaginal delivery nor prolonged labour. Her deliveries were in 1950, 1953, 1954, 1958, 1963, 1966, 1970. She did not know the weights as all her deliveries were at home assisted by a traditional birth attendant.

Menache was about 5 years prior to her first delivery (at about 17 years). She had used an intrauterine contraceptive device for about 20 years after her last delivery. This had been removed successfully after menopause.

Family history

She is a 6th born in a family of 10. She has 3 sisters, non of whom have a similar problem. She has been widowed for the past 24 years. She had used snuff in her youth for a short time.

Systemic enquiry

Was not contributory. She complained of intermittent headaches with normal vision. There was no chest pains, no cough or palpitations.

General examination

The patient was in good condition. There was no pallor, no jaundice, no palpable lymph nodes, no oedema, no finger clubbing.

Breasts were normal post menopausal. Tanners stage 5. They had no masses and were non tender.

Abdomen examination

The abdomen was scaphoid with a healed subumbilical midline incision scar. No area of pain. There were no masses on palpation. Liver and spleen span was normal.

Vaginal examination

There was Female genital mutilation grade 2 on inspection There was a mass at the introitus about 1.5 by 1.5 centimetres extending from the vagina. The urethral opening was normal. The mass protruded further down on Valsalva manoeuvre. The mass was noted to be dry but no bleeding was noted. There was no discharge seen.

Digital examination showed a descended uterus. The adnexa were free. There was no mass at the pouch of Douglas. There was no discharge or blood on the examining fingers. Bartholin's glands were not palpable. There was a cystocele demonstrated.

On rectal examination the anal tone was normal there mucosa was normal. There was no obvious rectocele demonstrated.

Other systems were essentially normal.

Diagnosis

An impression of Genital prolapse grade III was made.

Management

The patient was put on an oestrogen based creme and was planned for a total vaginal hysterectomy with colposuspension and colporrhaphy.

The investigations she was planned for were:

1. Biochemistry: Urea normal at 3.8 mmol/l, Creatinine normal at 61.2 µmol/l
2. Hemogram: Hb normal at 11.8 g/dl, White blood cells count 7.5 x 10^9/l,
   . Platelets 285 x 10^9/l
3. Intravenous cysto-urethrogram was normal.

The patient was admitted on 26th July for the operation. A proper history was taken and re-examination done. The findings were similar to those above.

The operation was done on 28th Jul. 2004. Examination under anaesthesia revealed a normal sized uterus for age, the adnexa were free. There was genital prolapse grade III. There was a small cystocele noted.

Total vaginal hysterectomy

In theatre she was given general anaesthesia. In lithotomy position the vulva and vagina were cleaned with chlorhexidine solution and painted with iodine solution. She was draped with sterile towels. The labia minora were stitched back on either side both anteriorly and at midposition. An Auvard speculum was inserted into the vagina posteriorly thus exposing the cervix and prolapsed uterus. The anterior lip of the cervix was grasped at its midpoint by a Volsellum forceps. A uterine sound was introduced and the uterine cavity found to be 5cm long. A weak solution of 1/240000 adrenaline in

saline was injected beneath the vaginal mucosa around the cervix. This solution was to act as a vaso-constrictor to ensure a relatively nonvascular field of operation and to help define the fascial layers accurately.

Four Kocher forceps were applied as follows:- one immediately below the external urethral meatus, two others slightly postero-lateral to the cervix on either side, and the forth one in the midline of the posterior fornix at the point where the vaginal skin was easily picked from the cervix. The 4 points were joined by an incision made with a scalpel through the thickness of the vaginal skin but not the fascia. The vaginal skin was then reflected by blunt dissection off the bladder and urethra towards the cervix. Similarly, vaginal skin was mobilized by blunt dissection from the lateral surfaces of both cardinal ligaments and also in the pouch of Douglas. The cervix was lifted forwards by traction on the volsellum attached to the posterior lip and the pouch of Douglas was defined and opened.

The posterior surface of the uterus and ovaries was explored with a finger to exclude any adhesions. The cervix was pulled to the right side and the left utero-sacral and cardinal ligaments were gasped using angled Kocher forceps. The ligaments were cut and transfixed using vicryl no 1 suture. The suture was held with a marker. A similar procedure was done on the right side.

The uterine vessels were identified on either side, clamped cut and transfixed with vicryl suture no 1. The utero-vesical pouch was then opened. The round ligaments, uterine tube and infundibulopelvic ligament and vessels were identified on right either side, clamped, cut and transfixed. These were missing on the left side. A marker was left on the pedicles. The uterus was then delivered.

The peritoneal cavity was closed with interrupted vicryl suture no 0 leaving all 6 pedicles extra-peritoneally. The utero-sacral and cardinal ligament pedicles from each side were sutured together in the midline to form an apex or centre point of the vault. Similarly, the broad ligament pedicles were also approximated at the midline. Anterior colporaphy was then performed.

The vagina was packed with a Vaseline gauze for about 6 hours. A catheter was left in the bladder. The patient was reversed from anaesthesia successfully. She was transfused 1 units of blood intra-operatively. Total blood loss was 500mls.

Post operatively the urine was clear, there was a normal output against an input. She was put on intravenous fluids, antibiotics and analgesics. She was started on oral sips after 24 hours and was transfused 1 unit of blood and given prophylactic antimalarial on resumption of oral sips. The vital signs remained normal. She had an abdominal distension after 12 hours which was managed conservatively on a flatus tube. She opened bowels on the 4th day. She was put on multivitamin and analgesics on discharge on the 7th postoperative day. She was to be reviewed in the GOPC after 1 week. She honoured the subsequent visits an was found to be in good condition.

Histology result of uterus: Sections from the cervix showed mild dysplasia involving the epithelium and endocervical glands. No foci of invasion was seen in all the sections examined. The endocervical mucosa showed simple polypoid hyperplasia. The endometrial showed normal early proliferation epithelium. Conclusion: No evidence of malignancy seen.

Discussion

The patient presented was an 70-year-old para 7+0 who presented with second degree uterine prolapse and total vaginal hysterectomy was done.

Pelvic organ prolapse is the downward displacement of structures that are normally located adjacent to the vaginal vault. Uterine prolapse is the abnormal protrusion of the uterus through the pelvic floor genital hiatus (1). These displacements are each associated with a defect in support structures and may therefore be considered as hernias (pudendal hernia). Cystocele, rectocele or enterocele usually accompanies uterine prolapse. The degree of uterine prolapse is usually defined by the relationship of the leading edge of the cervix to the vaginal introitus (2,3). These include:

1. First degree prolapse where there is slight descent of the uterus from the normal position (external os at the level of the ischial spines) but the cervix remains within the vagina.
2. Second degree where there is descent to the extent that the cervix (external os) protrudes through the vulva when the woman is straining or standing. The uterine body still remains inside the vagina.
3. Third degree where the entire uterus is prolapsed outside the vulva. The whole vagina or at least part of its anterior wall is inverted. This is also known as procidentia or complete prolapse.

This classification requires that the examiner have knowledge on normal pelvic anatomy. There are however other systems that encourage a complete examination and recording of anatomic details. These are the Baden-Walker Halfway System and the Pelvic Organ Prolapse – Quantification (POP-Q) system (1).

Genital prolapse is a disease of aging women affecting mostly white patients. The lifetime risk for surgery due to prolapse or urinary incontinence was estimated at 11.1% (4). Utero-vaginal prolapse is a common gynaecological problem and is responsible for about 20% of women on the waiting list for major gynaecology surgery in Britain (5). In a study in Oxford, utero-vaginal prolapse was the primary reason for 6.5% of all hysterectomies (6). At KNH, Mwalali found the incidence of pelvic organ prolapse to be 0.1% of all gynaecologic admissions (7).

The vast majority of women who will develop pelvic organ prolapse will have the process beginning with their first vaginal delivery (1). The etiology is considered in terms of weakening of the pelvic floor and increased downward pressure. Histochemical studies on biopsies of pelvic floor muscles have demonstrated evidence of denervation in these women (8). Predisposing factors include congenital or developmental weakness of the supports, injury sustained during childbirth, iatrogenic injury as during hysterectomy, atrophy of supporting tissues at climacteric, and all factors requiring a Valsalva manoeuvre or fixation of the respiratory diaphram and therefore displacing stress directly down on the pelvic floor, for example, chronic cough, obesity, pelvic tumours, lifting heavy objects and chronic constipation (1,3). Congenital type of prolapse is rare and may be picked in infants or nulliparous women (2,3,9). Complications of medical conditions such as diabetic neuropathy, chronic corticosteroid use, and connective tissue disorders also predispose to the same. Iatrogenic factors that may contribute to genital organ prolapse include failure to adequately correct all pelvic support defects at the time of surgery, ventrosuspension of the vagina that increases the exposure of the cul-de-sac to increase in intra-abdominal pressure, failure to detect and correct occult enterocele and, excessive shortening of the vagina (3). The patient presented was 70 years old, post menopausal and multipara and, therefore, at greater risk of having genital prolapse.

On the other spectra conditions which tend to cause inflammation on the parametrial and paracervical tissue, for example, pelvic inflammatory disease and pelvic irradiation would be protective (1).

The main presenting symptom is intolerable discomfort caused by the large mass protruding through the introitus. This significantly limits physical activity and social outings (1,10). Other symptoms and signs associated with utero-vaginal prolapse include sensation of swelling or fullness in the vagina, bearing down sensation, a dragging discomfort in the lower abdomen and pelvis, backache, voiding difficulties, difficulty in emptying the rectum and discomfort during coitus. The commonest symptom is a sensation of something coming down the vaginal (1,3,9). Mwalali (7) found that majority of patients (97%) presented with a feeling of something coming down the vagina while 12% presented with urinary symptoms. This patient presented with complaints of a mass coming down the vagina.

Complications of utero-vaginal prolapse include keratinization of the vagina decubital ulceration of the cervix and urinary tract infection resulting from incomplete emptying of the bladder (3). Downward movement of the uterus causes the lower ends of the ureters to be constricted and this may lead to obstruction with resultant hydroureter and hydronephrosis (1,3,9). Leukorrhea, abnormal uterine bleeding, recurrent abortions due to disordered uterine or ovarian circulation, and chronic decubitus ulcer may develop in procidencia. Recurrent urinary tract infections occur when there is associated cysto-urethrocese while haemorrhoids may form due to straining from constipation (10). The patient presented had non of the above complications.

Management of these patients can be conservative or surgical depending on the degree of prolapse and presence or absence of symptoms. For mild degrees of prolapse with mild or no symptoms, expectant management can be done. This will include taking measures to prevent or correct problems associated with prolapse, for example, obesity, constipation, and chronic cough. Post menopausal women can be advised on estrogen replacement therapy. Patients should be taught the technique of perineal muscle exercises and be encouraged to do them regularly (9). Vaginal pessary may be used as a palliative therapy if surgical treatment is contraindicated or as a temporary measure in mild to moderate prolapse (1,3,9). Pessary can also be used to promote healing of decubital ulcer prior to surgery. Infrequent removal and cleaning of the vaginal pessary can result in vaginitis and if forgotten in situ, may lead to erosion and fistula formation into the bladder (8).

Surgical management is indicated in advanced and symptomatic pelvic organ prolapse (3,12). Selection of surgical approach for uterine prolapse depends on the patient's age, her desire for future fertility or preservation of coital function, degree of prolapse and presence of associated conditions, for example, cystocele, stress incontinence or rectocele. The types of operations done include vaginal hysterectomy, anterior colporrhaphy, posterior colpoperineorrhaphy, transvaginal enterocele repair and vaginal vault suspension. A combination of the above procedures can be done depending on individual patients. Abdominal hysterectomy can also be done (1,2,3). In those patients who still desire to have children, the procedures that can be done include Manchester repair which involves anterior colporrhaphy, cervical amputation and posterior colpoperineorrhaphy. Other methods include sacral cervicopexy-hysteropexy or Shrodkar

sling cervicopexy (1,2,3). If the patient does not desire to have coital function, then an occlusive procedure such as colpocleisis might be the best choice. Colpocleisis has a very low failure rate (1). The patient presented was done total vaginal hysterectomy.

Complications of surgery include haemorrhage, infection and injury to the contiguous organs, blood vessels and nerves. Possible long-term complications include postoperative urinary incontinence, dysparaunia and recurrent pelvic organ prolapse (1,3). The Manchester procedure is associated with cervical incompetence due to shortened cervix, or infertility due to loss of cervical mucus (1,9). The care of patients with pelvic organ prolapse can be equally challenging and rewarding. Attention to details of anatomy, reconstructive surgical techniques, and proper medical care yields the best results (1).

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Case 4: Imperforate hymen with hematocolpos

Name : E.N. **Date of admission** : 30 Jan. 2004
Age : 16 years **Date of discharge** : 31 Jan. 2004
I.P. No.: 0986701

Presenting complaints

She was admitted to the acute gynaecology ward through casualty with a one week history of abdominal pain and swelling.

History of presenting complaint

She was well until one week prior to admission when she developed abdominal pain that was colicky in nature. At the same time she noticed abdominal swelling in the lower part of the abdomen which was not progressive. Bowel and micturation habits were normal. She gave a history of cyclical lower abdominal pains. There was no history weight loss or vomiting.

Past medical history was not significant.

Obstetric and gynaecologic history

She was para 0 + 0. She had not had any menses. There was no history of vaginal coitus.

Family and social history

She was single and stayed with her mother. She was educated up to standard 8. There was no family history of chronic illness. She neither smoked cigarettes nor drunk alcohol.

Physical examination

She was in good general condition. There was no pallor, edema jaundice or lymphadenopathy. Her blood pressure was 100/65 mmHg, pulse rate 80/minute regular, respiratory rate 20/minute and temperature 36.8°C.

Breasts: The breasts were well developed at Tanners stage 4 and axillary hair was present.

Cardiovascular, respiratory and central nervous systems were essentially normal.

Abdominal examination

There was generalised distension in the lower abdomen and the abdomen moved with respiration. There was a suprapubic mass corresponding to a 18 week gestation. It was firm, mobile, with a regular outline, smooth surface and tender on palpation. Spleen and liver were not enlarged and there was no shifting dullness.

Pelvic examination

The external genitalia was normal with moderate growth of pubic hair. There was a bulging bluish membrane obliterating the introitus. Digital or speculum examination could not be done. The urinary bladder was catheterised and clear urine drained but the size of the mass did not change. On rectal examination the anal opening was normal. The rectal mucosa was freely mobile. A tender fluctuent mass was felt filling the vagina and continuous with the suprapubic mass.

Diagnosis

A diagnosis of imperforate hymen was made.

Investigations done

1 Ultrasound showed a large cystic mass arising from the pelvis. With a of size 13 x 7.4 x 6.2cm. The uterus was small. Ovaries not well visualised.
2. Haemoglobin level 12.0g/dl
3 Biochemistry: Na+ 135 mmol/l, K+ 4.02 mmol/l, urea 3.6mmol/1
Creatinine 63 µmol/l.

Management

The patient and her mother were explained to the diagnosis and mode of management. Consent for the operation of cruciate incision under general anaesthesia was obtained from the mother. The patient was starved overnight and premedicated with intramuscular atropine 0.6mg before being wheeled theatre.

Cruciate incision

In theatre she was given general anaesthesia. In lithotomy position vulval-perineal toilet was done and the perineum draped with sterile towels. The bladder catheterized and clear urine drained. Examination under anaesthesia revealed normal external genitalia. There was a firm bluish membrane obliteration introitus. Rectal digital examination

revealed fullness in the vaginal canal. A separate uterus was not felt and there was no adnexal mass palpated.

A vertical incision was made into the membrane starting 2 o'clock extending to 8 o'clock. About two litres of chocolate coloured fluid drained. In the process the abdominal mass disappeared. Another incision made from 10 o'clock to 4 o'clock. The four flaps created by the cruciate incision were trimmed off thus creating a round hole. Bleeding vessels were ligated and hemostasis achieved. A clean pad was put at the perineum and patient reversed from anaesthesia.

Postoperative care

She was taken to the recovery ward and observed half hourly until fully awake after which she was transferred back to the ward. She was put on amoxycilin 500mg, and paracetamol 500mg 8 hourly for 5 days. She remained stable and was discharged home the same day in the evening. She to be reviewed in the gynaecology outpatient clinic one month with an intravenous urogram done as outpatient.

Follow-up

She was seen in the clinic and had no complaints. She had received her menses normally. Examination showed she was in good general condition. She had no abdominal mass. The vagina was admitting one finger easily. The Intravenous urogram done was normal. She was discharged from the clinic.

Discussion

The patient presented was a 16-year-old girl with amenorrhoea secondary to imperforate hymen. A cruciate incision was done with good results.

The hymen is a fairly thin, elastic, and translucent membrane, sometimes cribriform in appearance, which is composed of endoderm from the urogenital epithelium located at the junction between the sinovaginal bulbs and the urogenital sinus. The hymen is histologically defined as a connective tissue membrane covered by stratified, squamous epithelium. The hymenal remnant remaining after the first coitus is the carunculae hymenalis. The hymen is usually perforated in embryonic life to establish a connection between the lumen of the vaginal canal and the vaginal vestibule. It is usually torn in pre-puberty years. If there is no perforation through this membrane, that is canalization fails to occur, it is called imperforate hymen (1). Variations in hymen development occur and complete blockage of the hymen of the introitus is rare. Imperforate hymen is probably the most common obstructive anomaly of female genital tract with a frequency of approximately 0.05% –0.1% in newborn females. Most cases occur sporadically with no evidence to suggest any genetic factors (2,3). Some evidence recently evaluated the genetic transmission of imperforate hymen and reported that the probable recessive inheritance (4).

Imperforate hymen is almost always an isolated finding. However, associated urological abnormalities have been found in 20% cases. Associated congenital anomalies reported in these patients include urethral membrane, imperforate anus, bifid clitoris, hypoplastic kidneys with ectopic ureters and vascular anomalies (5). The patient presented had only imperforate hymen with no other associated anomaly.

Transverse vaginal septum, which results from faulty canalization of embryonic vagina, is also present at birth and has a similar presentation imperforate hymen. Distinction between imperforate hymen and transverse vaginal septum is largely academic because their effects and treatment is identical (5,6).

Imperforate hymen has no serious effects if the uterus is absent (5). If the uterus is present, it is unusual to have any symptom childhood. However, due to stimulation of the uterus and cervix by maternal hormones in utero, mucus may collect in the vagina causing mucocolpos at birth (1,6). Symptoms appear after the onset of

puberty with girls presenting at 13–15 years. When the uterus begins to menstruate at puberty cryptomenorrhoea or ammenorrhea occurs. With each monthly discharge, the vagina fills with blood which remains fluid. As the amount gradually increases, first the vagina distends (haematocolpos) then the uterus (haematometria) and finally the tubes (haematosalpinx) (1). Some cases blood may flow freely into the peritoneal cavity (haemoperitoneum). In most cases the altered blood tends to set up an aseptic inflammation in the tubes that tends to close up the tubes and prevent or limit peritoneal spill (6). The enlarged vagina and uterus may displace the fundus of the bladder upward thus causing urinary retention by interfering with the opening of the urethral sphincter (5).

Imperforate hymen is usually not diagnosed until an adolescent girl present with complaints of primary amenorrhoea and recurrent pelvic pain (1,6). The most common symptom of vaginal over distention are lower abdominal pain, discomfort in the pelvis and pain in the lower back. The back pains are thought to be due to referred pain caused by sacral iliac plexus irritation. The lower abdominal pain is exercebated by defecation and constipation may be a hallmark presentation due to vaginal compression on the rectum. Occasionally the first symptom may be urinary retention. Other urinary symptoms including urgency, frequency and dysuria. Overflow incontinence may eventually develop (1). Hydronehprosis does occur though rare, and even more rare is imperforate hymen complicated with ruptured hematosalpinx (7).

On examination a tender mass is palpable suprapubically. Vulval inspection reveals the bulging imperforate hymen (1) which may or may not be bluish in colour depending on its thickness. On recta examination the vagina is palpable as a large cystic mass (5,6). This patient presented with lower abdominal swelling and pain and or examination she was found to have imperforate hymen with haematocolpos. Complications of imperforate hymen include vaginal adhesions an endometriosis. There may be permanent impairment of reproductive function (6).

Imperforate hymen is corrected by surgical treatment. This involves excision of the membrane to allow flow of the accumulated fluid. The incisions are preferably made at 2-, 4-, 8-, and 10-o'clock positions (X-shaped incision). The quadrants of the hymen are then excised, and the mucosal margins are approximated with fine delayed

absorbable suture. To prevent scarring and stenosis, which could result in dyspareunia, the hymenal tissue should not be excised too close to the vaginal mucosa. Intrauterine instumentation should be avoided during the same sitting as chances of perforating the already overstretched uterus (due to hematocolpos) are high (1,6). Good hemostasis is important, and strict aseptic conditions are necessary owing to the low natural resistance to infection in the operation field. There are no *Doederlein* flora at this stage, and the retained blood is a good culture for pathologic organisms. Because of the risk of pelvic peritonitis, antibiotics are given prophylactically. It is advisable to avoid compression of the uterus and fallopian tubes to speed up blood evacuation (7).

In those societies where hymenal architecture is important the Foley catheter was applied to after performed oval-centralize closure on imperforate hymen membranes, Foley catheter was inserted through closure of hymen and then balloon of Foley catheter is insufflated 10 ml. The catheter is removed after 2 weeks (8).

Follow-up evaluation of the vagina and pelvis should be deferred for 4-6 weeks to reduce risk of introducing infection (6). If the uterine mass does not regress within 2-3 weeks, inspection and dilatation of the cervix should be performed to make certain that drainage from the uterus is satisfactory (l). An intravenous urograph (IVU) should be done in these patients to investigate for urinary tract anomalies (6). In the patient presented excision of the hymen was done with good results. IVU done was normal.

Considering the simplicity of diagnosis and the relative ease of surgical correction, routine postnatal examination of such a condition is advisable delayed diagnosis can lead to undesirable complications (5).

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Case 5: Symptomatic uterine fibroids – total abdominal hysterectomy

Name	: C.N.	**Date of admission**	: 2 Feb. 2004
Age	: 41 years	**Date of discharge**	: 10 Feb. 2004
I.P. No.	: 0895737		

Presenting complaints

The patient presented with complaints of progressive lower abdominal swelling, pain and heavy menstrual flow for 8 years.

History of presenting complaint

The patient was well till 8 years prior when her menses became heavy and she also noticed a progressive lower abdominal swelling with a dull pain. Micturation habits were normal but she got constipated on and off. There was no par vaginal discharge. There was no weight loss. She had been treated in several outpatient clinics before she came to KNH in 2002 where she was followed up in GOPC with symptomatic uterine fibroids. She was then lost to follow-up. She deliberately stopped attending clinic after being informed that she required an operation due to financial constrains. However, the symptoms worsened and she came back in Aug 2003. She was reinvestigated and found to have symptomatic uterine fibroids and she was scheduled to be admitted electively for total abdominal hysterectomy.

Past medical history

She had been followed up for secondary infertility from 1986 till 1991 when she gave up. She was being treated in provincial government hospitals and private hospitals. She started having irregular heavy menses in 1998 and used to be treated at various city hospitals. However, there was no history of admission to hospital.

Obstetrics and gynaecology history

She was a para 1+0 whose only delivery was in 1985 to a male infant by SVD who was alive and well. Her menarche was at 16 years with a cycle of 28 days and a flow of 4–5 days before it became irregular. Currently her menses were heavy, they could last even 10 days and the bleeding had clots, moreover, the normal cyclicity had been lost. She had used intrauterine contraceptive device after her first delivery in 1985 to 1986 and had not used any other contraceptive method thereafter.

Family and social history

She was a divorced lady who lived in Kawangware. She was divorced in 1990 because of failure to conceive. She was a teacher. She did not smoke tobacco nor take alcohol. There was no history of chronic illness in her family.

Systemic inquiry was non-revealing.

Physical examination

She was a middle-aged woman in fair general condition, was afebrile, not pale, had no jaundice, no oedema and no lymphadenopathy. The vital signs were essentially normal.

Respiratory, cardiovascular and central nervous systems were normal.

Abdominal examination

There was a swelling in the lower abdomen with a mass corresponding to uterine size 26 weeks, the mass was firm, had an irregular surface, non-tender and mobile. There was no hepatosplenomegally.

Pelvic examination

She had a normal external genitalia, the cervix was central, smooth and firm with a parous os. The uterus was about 26 weeks and had a firm mass. The uterus was mobile. The adnexa and Pouch of Douglas were free. There was a normal whitish discharge on the examining finger.

Impression

An impression of symptomatic uterine fibroids was made.

Investigations

1. Pelvic ultrasound: showed features of multiple uterine fibroids, the adnexa and pouch of Douglas were normal.
2. Pap smear: no abnormal cells seen.
3. Hemogram: Hb 11g/dl; WBC 5 $x10^9$/L; Platelets $250x10^9$/L

Management

She was planned for a total abdominal hysterectomy. Two units of blood were grouped and cross-matched to accompany the patient to theatre. Informed consent was obtained.

Discussion

Uterine leiomyomas are benign clonal tumours that arise from the smooth muscle cells of the human uterus. Various terms are used to refer to the tumor; fibromyoma, myofibroma, leiomyofibroma, fibroleiomyoma, myoma, fibroma and fibroids. The term leiomyoma is reasonably more accurate as it emphasises the origin of the tumor from smooth muscle cells and the predominance of the smooth muscle component (1). They are the single most common indication for hysterectomy. They are clinically apparent in about 20–25% of the women under the age of 50 years (2), and with newer imaging techniques, the true clinical prevalence may be higher. Careful pathological examination of surgical specimens suggests that the prevalence is as high as 77% (3). The annual incidence of diagnosed leiomyomata in one prospective cohort of US women aged 25–44 was 12.8 per 1000 women/years. Black women tend to have leiomyomata 3-9 times more than do white women (3). Leiomyomata are the most commonly listed discharge diagnosis for hysterectomy in the United States (4).

In most instances they do not cause symptoms but when they do they can impair the quality of life warranting treatment. Symptoms are found in less than 50% of the women and may be single to multiple and depend on the location, size and number of tumors present. These are generally be classified in three distinct categories: abnormal uterine bleeding; pelvic pressure and pain; and reproductive dysfunction (1,2). The bleeding pattern most characteristic of myomas is menorrhagia or hypermenorrhoea, prolonged or excessively heavy menstruation. Bleeding at other times of the cycle is not characteristic of myomas, and it should be investigated to rule out endometrial disease. The heavy bleeding can cause anaemia (1,2). Location seems to be more important than size in determining the bleeding symptoms. Submucous myomas, those in or partially intruding into the endometrial cavity, are most likely to cause menorrhagia. The reason is due to abnormal concentration in prostaglandins, and other factors that are not isolated (1,2).

Pelvic pressure arises when the uterine size is increased. The size of myomatous uterus is described in menstrual weeks, as is a pregnant uterus. Unlike the pregnant uterus, a myomatous uterus is irregularly shaped and the specific symptoms can arise from myomas in a particular location. The pressure can be to the urinary system causing mild symptoms to retention of urine or obstructive uropathy. There is acute pain in the rare cases when degeneration occurs or when there is torsion of a pedunculated

fibroid. When acute pain is the sole indication for treatment, other disease processes particularly endometriosis or ovarian disease should be carefully excluded (2). The diagnosis of myomas is often suspected on the basis of palpation of an enlarged irregular uterine contour on pelvic examination. Ultrasonography is typically used to confirm the diagnosis and exclude the possibility of ovarian neoplasm. Magnetic resonance imaging gives better visualization of individual myomas, but is expensive (5).

Reproductive dysfunction is not inevitable with the myomatous uterus, but the risk of placental abruptio is substantially increased if a myoma is under the placental site (3). Other pregnancy complications including pain and premature labour are directly related to the size of the myoma (3). If the endometrial cavity is distorted by submucous myomas, the risk of infertility is increased (4). The role of intramural myomas in causing infertility is controversial: older studies suggest that they are a rare source of infertility, but more recent studies in women undergoing in-vitro fertilization suggest they play a part more commonly. There may be interference with sperm transport caused by distortion and an increased surface area within the uterine cavity, impingement of leiomyomata on the endocervical canal or interstitial portion of the fallopian tube, or interference with prostaglandin-induced uterine contractions, which are thought to enhance sperm migration. Endometrial changes (atrophy, ulceration, focal hyperplasia, and polyps), vascular alterations (venous congestion, impaired blood flow), enlargement of the uterine cavity may be present. Uterine leiomyomata occur in later reproductive years, therefore, relative greater difficulty in accomplishing contraception is expected in older couples. However, couples should complete a full infertility assessment before the role of myomas is addressed (1,6).

Leiomyomata have been known to cause recurrent pregnancy loss. The mechanisms postulated are; disturbances in the uterine blood flow, alteration in blood supply to the endometrium, uterine irritability, rapid growth or degeneration of the leiomyomata during pregnancy, difficulty in enlargement of the uterine cavity to accommodate for the growth of the fetus and placenta, and interference with proper implantation and placental growth by poorly developed endometrium or subjacent leiomyomata. There may an increased the malformation rate in embryos implanted in such uterine cavity leiomyomata (7). The effects of leiomyomas's size location and number in pregnancy can be concluded as; growth of myomas cannot be predicted, placental implantation over

or in contact with a leiomyoma increases the likelihood of placental abruptio, abortion, preterm labour, and postpartum hemorrhage, malpresentations and malpositions are more common, and the incidence of Caesarean delivery is increased (8).

Reproductive factors also affect the risk of myomas. Many studies have shown that being parous (having one or more pregnancies extending beyond 20 weeks) decreases the chance of myoma formation (7,8,9). Although clinical teaching for many years was that oral contraceptives were contraindicated for women with myomas, these drugs actually protect against clinically evident fibroids (8,9,10). Timing of use is important. Exposure to oral contraceptives between the ages of 13 and 16 years led to an increased relative risk of myomas, whereas, use in general showed protection in direct proportion to duration of use (9). During both pregnancy and use of oral contraceptives, concentrations of estrogen and progesterone are high, yet both factors decrease the risk of fibroids. Thus, influences other than concentrations of steroid hormones are important. The common factor may be the lack of menstrual cyclicity. One hypothesis is that myoma formation may be viewed as a response to injury, potentially from hypoxia in myometrial cells during menstruation (1,2,8,9).

Environmental factors also influence the risk of fibroid formation. Several studies have shown that smoking decreases the risk (7,12). Substantial consumption of red meats was associated with an increased relative risk and consumption of green vegetables with decreased risk (13). However, there is no evidence that dietary intervention leads to changes in incidence or symptom patterns.

Uterine myomas, being benign tumours, can generally be managed expectantly unless they cause symptoms. Several factors determine treatment, including their size and location of myomas; the presenting symptoms, the age and reproductive desires of the patient and the skill of the surgeon. There has been little evidence-based assessment of myoma therapies. These can generally be classified into medical or surgical management.

Myomas respond to the gonadal steroids oestrogen and progesterone, and their epidemiology parallels the ontogeny and life cycle changes in reproductive hormones. Myomas have not been described in prepubertal girls. Although they have been reported in adolescents, most women are in their 30s or 40s when the myomas become

symptomatic. In most women the symptoms are relieved at menopause. However, increasingly there are reports of women who develop symptoms or have continuing symptoms while taking hormone replacement therapy in their post-reproductive years (4). This the principle behind medical management of leiomyomata. Effective medical treatment is that results in permanent cure of uterine leiomyomata is yet to be discovered. Symptomatic treatment with haematinics, analgesics and use of progestagens is widely practised. Danazol is useful and acts by inducing amenorrhoea. Antiprogestin, for example, mifeprostone, therapy has been shown to reduce the leiomyomata volume by about 50% (14). Mifeprostone acts as a progesterone antagonist while maintaining follicular concentrations of estradiol. The mechanism being thought to be due to a reduction in the uterine blood flow. Another drug used with good effects is gestrinone (a synthetic derivative of ethyinyl-nor-testosterone) (1).

GnRH agonists, the mainstay of medical therapy for myomas, work by first increasing the release of gonadotrophins, which is followed shortly by desensitization and downregulation to hypogonadotrophic hypogonadal state, clinically resembling menopause. These agents produce a significant reduction in uterine size, generally 35% to 65% as well as ammenorrhea in most women. However, after discontinuation of the medication, there is rapid resumption of menses and return to pretreatment uterine volume. In addition the severe hypoestrogenism that accompanies this therapy can cause significant symptoms and most importantly, bone loss that can lead to osteoporosis with long-term use. Thus, GnRH agonists are primarily used to temporize or allow a woman to prepare for surgery, and this use does have the proven benefit of a documented decrease in blood loss at the time of surgery and an increase in preoperative packed cell volume (15). GnRH agonists are however very expensive and their effects are reversed after stopping treatment.

Since the biology of uterine fibroids has traditionally been explained in terms of steroid hormones, and thus all current medical therapies manipulate these hormones, there are innovative ways to manipulate the actions of both estrogen and progesterone selectively. Future directions are moving towards use of GnRH antagonists, which provide a rapid onset of action (15,16). After pituitary down-regulation, steroidal add-back may lead to increased compliance with long-term therapy. The major steroid studied to date is Tibolone, which has estrogenic, androgenic, and progestational activities. Tibolone was

associated with higher rates of ammenorrhea in post menopausal women with myomas than was conventional hormone replacement therapy. In premenopausal women with myomas treated with tibolone after GnRH-agonist downregulation, there was preserved bone density and lipid profiles without reversal of uterine shrinkage (15).

Preliminary studies have begun on both identification of genes through genome-wide scan and sub-pair analysis and elucidation of possible mechanisms of gene therapy that take advantage of the physiology of myomas (16).

Surgery has long been the main mode of therapy for myomas. Hysterectomy eliminates both the symptoms and the chance of recurrence. This is the best choice for women who have no desire for children or have completed family size (15). However, for women who desire future pregnancies or wish to retain the uterus for other reasons, other options are available: (17)

1. Removal of fibroids (Myomectomy by laparotomy, Laparoscopic myomectomy, Laparoscopic assisted myomectomy [LAM], Vaginal myomectomy, Hysteroscopic resection of a fibroid)

2. Reduction in the size of fibroids (Uterine artery embolisation [UAE], Laparoscopic bipolar coagulation of the uterine blood vessels, Laparoscopic myolysis, Cryomyolysis, and Interstitial laser photocoagulation).

Myomectomy (removal of fibroids with uterine conservation) is widely done. For women with submucous myomas, hysteroscopic myomectomy has distinct advantages. For women who have completed child-bearing and for whom bleeding is the primary problem, endometrial ablation alone or in combination with hysteroscopic myomectomy will give relief. Uterine artery embolization is a novel technique for the treatment of myomas based on the hypothesis that control of arterial blood flow will control the symptoms (15,16,17). There may be potential for surgical approaches for myomas to be modified to increase effectiveness or decrease invasiveness. Use of MRI-guided percutaneous laser ablation is one such model. High intensity ultrasound technology may also be used in this system (16,17).

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Case 6: Choriocarcinoma – chemotherapy with remission

Name : P.A. **Date of admission** : 30 Nov. 2003
Age : 30 years **Date of discharge** : 4 Jan. 2003
I.P. No.: 0928470

Presenting complaints

She was admitted to the acute gynaecological ward from casualty with a two week history of lower abdominal pain, dysuria and vaginal discharge, and a five-day history of spotting.

History of presenting complaint

She had been well until two weeks previously when she developed lower abdominal pain and dysuria. The abdominal pain was colicky in nature and was non-radiating. She also developed a brownish vaginal discharge that was not foul smelling. She had dysuria and frequency. She developed spotting five days prior to admission.

Past medical history was not significant

Obstetric and gynaecology history

She was a para 1+0 gravida 2. LMP 12.9.2003. Period of ammenorrhea was therefore 11 weeks. She had a spontaneous vertex delivery at term in 1999. The baby weighed 3kg and was alive and well.

Menarche was at 16 years. Menses lasted 4 days and cycles were 28 days and regular. She had normal flow of menses and experienced no dysmenorrhea. She had used Depo-provera from 1999 for 2 year.

Family and social history

She was married and unemployed. She was living with her child and husband who was a businessman. There was no family history of chronic illness . She did not drink alcohol or smoke cigarettes.

Physical examination

She was in fair general condition was not pale, not jaundiced, had no oedema or lymphadenopathy. Blood pressure was 110/70 mmHg, pulse rate 96/minute regular, respiratory rate 22/minute and temperature 37°C.

The cardiovascular and central nervous systems were essentially normal.

Respiratory system: There was good air entry bilaterally and there no abnormal sounds.

Abdominal examination

The abdomen was mildly distended in the lower half. There were no surgical scars. There was mild suprapubic tenderness. The uterus was 20 weeks size. No fetal parts were perceived.

Pelvic examination

The external genitalia was normal. The cervix was soft, long posterior and the os was closed. Cervical motion test was negative. Both adnexae and pouch of Douglas were not full. There was blood on examining finger.

Impression

An impression of threatened abortion was made with a differential diagnosis of wrong dates and urinary tract infection.

Management

She was started on Nitrofurantoin 100mg 8 hourly and Paracetamol lg 8 hourly. She was advised on bed-rest. She was booked for ultrasound, and blood and urine were taken for investigations.

Results of investigations

1. Ultrasound 3.12.2003 showed a huge uterine mass that was consistent with a molar in echopattern measuring 14.7cm by 8.8cm. There were bilateral adenexal multiseptate cysts measuring 5.48cm by 4.81cm and 5.29cm by 4.42cm. A diagnosis of hydatidiform mole was therefore made.
2. Hemogram: Hb 10.5g/dl, WBC 8.1 x 10^9/l, RBC 4.04 x 10^{12}/l ,Plat 200 x 10^9/l
3. Biochemistry: Sodium 140 mmol/l, Potassium 3.5 mmol/l, Urea 4.0 rnmol/l, Creatinine 90 µmol/l
4. Urinalysis: Many pus cells on microscopy. No growth was obtained on culture.

The results of investigations were explained to the patient. She was informed that uterine evacuation had to be done in theatre. However, while waiting to go to theatre she aborted a hydatidiform mole on 14.12.2003, in the ward. Next morning she was noted to be bleeding, manual vacuum aspiration was done in the procedure room and a specimen taken for histology. She continued on antibiotics and discharged to come after 2 weeks for sharp curate. A check haemoglobin done in preparation for sharp curettage was 7g/dl and she was transfused two units of blood. She was done sharp curettage in theatre on 4.1.2004 and another specimen taken for histology. She was discharged home in stable condition on 5.1.2004 and was for review in the GOPC in two week.

Readmission

She was readmitted on 21.1.2004 from GOPC due to continued bleeding. Histology results had confirmed choriocarcinoma. On examination she was in fair general condition mild pallor. On abdominal examination there was suprapubic tenderness and the uterus was 14 weeks size. On vaginal examination the cervix was long, posterior and the os was closed. There was no fullness in both adnexae or pouch of Douglas. Cervical excitation was negative bilaterally. There was fresh blood with no clots on examining finger.

Investigations done after readmission

1 Hemogram: Hb 9.0g/dl, WBC 4 x 10^9/l, RBC 4 x 10^{12}/l, Plat 250 x 10^9/l
2. Biochemistry: Sodium 139 mmol/l, Potassium 3.9 mmol/l, Urea 3.8 mmol/l, Creatinine 89 µmol/l
3. Liver function tests were within normal
4. Abdominal ultrasound showed a normal uterus and kidneys. The uterus was bulky and there were bilateral adenexal cysts.
5. Chest X-ray normal
6. ß-hCG level 42600 IU/l

Diagnosis after readmission

A diagnosis of low risk choriocarcinoma was made.

Management

She was started on Methotrexate 25mg daily intravenously for five days. She tolerated the medication well and was discharged home on the fifth day. She was to be admitted in 10 days time for the second course. She was to have hemogram, urea and electrolytes, and liver function tests done before readmission.

The liver function, kidney function and hemogram were normal at checking after each course of treatment. She continued with methotrexate until the sixth course when a third negative ß-hCG level was obtained (<2 IU/l).

ß-hCG levels during treatment (normal range 0-10 IU/l)		
Course	Date course given	pretreatment ß-hCG (IU/l)
1st	24/1/2004	42,600
2nd	16.2.2004	4260
3rd	10.3.2004	1654.8
4th	1.4.2004	35.7
5th	23.4.2004	4.6
6th	20.5.2004	3.0
7th	15.6.2004	<2.0

The patient was discharged home after the seventh course of chemotherapy. She was to be seen in GOPC in two weeks time with results of, ß-hCG and chest X-ray. She was advised to continue oral contraceptives and advised to be followed up strictly with monthly ß-hCG and physical examination up to 3 months then 3 monthly up to 6 months and then 6 monthly for a total of 24 months before she could then be think of pursuing her obstetric career.

Discussion

The patient presented was a 30-year-old para 1+0 who developed choriocarcinoma following a molar pregnancy. She was started on single agent chemotherapy with Methotrexate and went into remission after seven courses.

Gestational trophoblastic neoplasms include the tumour spectrum of (i) hydatidiform mole (complete or partial), (ii) invasive mole (chorioadenoma desturens), (iii) placental site trophoblastic tumor (PSTT) and (iv) choriocarcinoma. They arise from fetal tissue within the maternal host and are composed of both syncyotrophoblastic and cytotrophoblastic cells except placental site trophoblastic tumor which is derived from intermediate trophoblastic cells. It is a solid tumor which is disseminated and highly curable with a cure rate of approximately 90%. They have properties of the placenta including invasion and liberation of human chorionic gonadotrophin (hCG) (1). Hydatidiform mole represents the benign end of the spectrum while choriocarcinoma is at the other extreme end (2).

Choriocarcinoma is rare and is reported in 2–5% of all cases of gestational trophoblastic neoplasm (1). The incidence in the Far East and Central Africa is reported as 1 in 5000-6000 pregnancies. The incidence of trophoblastic disease is reported to be highest in S.E Asia with Taiwan reporting an incidence of 1:82 pregnancies. In Europe and North America the reported incidence is between 1: 1500 and 1:2500 pregnancies (1,3). In a study at Kenyatta National hospital, 65 cases of choriocarcinoma were diagnosed in a period of 7 years and a repeat study in the same hospital in 1984 reported an incidence of 1:1118 deliveries (4). The actual incidence of Choriocarcinoma in Kenya is unknown.

In about 50% cases, choriocarcinoma follows a molar pregnancy. Twenty five % follows a term pregnancy while the rest follow other forms of pregnancy (ectopic pregnancy or abortion) (2). The patient presented had choriocarcinoma following a molar pregnancy. The primary growth is usually in the uterine wall but may be in the cervix or vagina, or in the tube or broad ligament following ectopic pregnancy. The tumour is soft, necrotic, hemorrhagic, dark red or purple in colour and rugged or friable. Histologically, choriocarcinoma is characterized by sheets or foci of anaplastic syncytiotrophoblast and cytotrophoblast without chorionic villi penetrating the myometrium or blood vessels. Sometimes the cells are arranged in plexiform or in completed disorganization (5). The tumour is unusual in that it does not stimulate any stromal reaction and is therefore

essentially a mixture of haemorrhage and necrosis with tumour cells scattered within the mass (3,6). In choriocarcinoma the predisposition of normal trophoblast to invasive growth and erosion of blood vessels is greatly exaggerated (5).

The leading symptom is irregular uterine bleeding coming sooner or later after expulsion of a mole or a normal pregnancy (3,5,6). An offensive vaginal discharge and cachexia with pyrexia may be the initial presentation (3). In many cases the first indication may be a metastatic lesion. Gestational trophoblastic disease has a non-gynaecological presentation in more than 1/3 of cases (5). There can be vaginal or vulval tumours, cough and bloody sputum from pulmonary metastasis, or headache and visual disturbance from brain metastasis (3). This patient presented with vaginal bleeding 1 month after a molar abortion. Metastasis often develop early and are generally blood born because of the affinity of trophoblast for blood vessels. The most common sites of metastasis are lungs (75%) and vagina (50%). The vulva, kidneys, liver, ovaries, brain and bowel are also common sites of metastasis (1,3,5). Cerebral metastasis are usually a poor prognostic sign for the patient (7). The patient presented did not have evidence of metastasis outside the uterus.

Diagnosis relies on history. Any case of unusual bleeding after a term pregnancy or abortion should be investigated by curettage and measurement of chorionic gonadotrophin level (hCG). Persistent or rising gonadotrophin level in the absence of pregnancy is indicative of trophoblastic tumour. Ultrasound is done to evaluate the degree of uterine involvement. Chest X-ray detects lung metastasis (cannon-ball appearance). CT-scan should be done to evaluate the brain, lung, liver and pelvis (6,7,8). Several other investigations are done after diagnosis is made and before starting treatment. These include blood group and rhesus, full hemogram, liver function tests, blood urea and electrolytes, and baseline, ß-hCG (1).

There are three systems currently in use for the clinical classification of malignant gestational trophoblastic disease. No single system is consistently being used internationally, thereby making comparison in treatment success difficult (1,9). The inclination in Kenyatta is usage of the WHO prognostic scoring system for GTD. The difference between the WHO classification and FIGO 2000 staging/scoring system (10) are ABO blood group risk factors are eliminated and the risk factor for liver metastasis is upgraded from 2 to the highest risk group 4.

National Cancer Institute categorization of gestational trophoblastic neoplasia

A Nonmetastatic disease: No evidence of disease outside uterus

B Metastatic disease: Any disease outside uterus

	1. Good-prognosis metastatic disease	**2. Poor-prognosis metastatic disease**
a.	Short duration (<4 months)	Long duration (>4 months)
b.	Serum ß-hCG <40000 IU/l	Serum ß-hCG >40000 IU/l
c.	No metastasis to brain or liver	Metastasis to brain or liver
d.	No significant prior chemotherapy	Unsuccessful prior chemotherapy
e.	—	Gestational trophoblastic neoplasia following term pregnancy

P.A. had a non metastatic disease

Revised FIGO staging system based on the site of disease extension with presence or absence of 2 risk factors

Stage

I Disease confined to the uterus

II Disease extending outside of uterus but limited to the genital structures (adnexa, vagina, broad ligaments)

III Disease extending to the lungs, with or without known genital tract involvement

IV Disease at other metastatic sites

Substage	**Risk factors**
A. No risk factors	1. ß-hCG > 100,000 IU/l
B. One risk factor	2. Duration from termination of the antecedent pregnancy to diagnosis >6 months
C. Two risk factors	

P.A. had stage IA disease.

The FIGO 2000 staging/scoring system (modified from the World Health Organization [WHO] scoring system) is based on the individual's risk factors as shown on the table. The patients are categorized into low- and high-risk based on the total score (this is different from the WHO scoring system which classifies the patient into low-, medium- and high-risk). The middle risk group is eliminated in FIGO classification as this group has usually been treated with combination chemotherapy as those of high risk category.

The scoring/staging system for the FIGO 2000 (gestational trophoblastic disease)

Parameter	FIGO score			
	0	1	2	4
Age (years)	<39	>39		
Antecedent pregnancy	Mole	Abortion	Term	
Interval from end of antecedent pregnancy to start of chemo. (months)	<4	4–6	7–12	>12
Pretreatment ß-hCG level (IU/l)	10^3	10^3–10^4	10^4–10^5	>10^5
Largest tumour including uterine (cm)		3–5	>5	
Sites of metastasis		Spleen, kidney	GIT	Brain, liver
Number of metastasis		1–4	4–8	>8
Prior chemotherapy failed			Single	>2

Total score: <6 is low risk, ≥7 is high risk

P.A. was scored 3. She therefore fell in the low risk group.

Treatment mode depends on the risk group, or stage, of the disease (9). The modalities available are chemotherapy, radiation and surgery (8). Chemotherapy remains the mainstay of treatment of gestational trophoblastic disease. Single drug therapy is usually used for low risk gestational trophoblastic disease and methotrexate with or without folinic acid, actinomycin D, etoposide, 5-fluorouracil and bleomycin all can be used (7). In our unit methotrexate with or without folinic acid is the commonly used single agent at a dose of 0.4 mg/kg for 5 days, with rest period of 2 weeks then repeated till ß-hCG levels fall within normal limits. Of utmost importance in treating these patients is institution of therapy as quickly as possible and continuing therapy at very close intervals until normal ß-hCG titres are obtained. The interval between courses should rarely exceed 7–I0 days depending on the treatment regime and toxicity. Combination chemotherapy is also used if there is resistance to single agent therapy (1). Patients should receive 3 courses of chemotherapy after the first normal ß-hCG depending on extent of disease (1). P.A.'s ß-hCG level was normal after the 4th course of treatment and she continued up to the 7th course.

High-risk gestational trophoblastic disease is usually treated with multiagent drug therapy. Several protocols have been advocated. Our unit uses the MAC protocol (methotrexate, actinomycin D, cyclophosphamide), which is given as follows: Intravenous methotrexate 0.4 mg /kg day for 5 days; Intravenous Actinomycin D 0.5 mg daily for 5 days; Intravenous Cyclophosphamide 3 mg/kg for 5 days. The course is repeated with minimum rest period of seven days, and ensuring haemoglobin level of more than 10g/dl, white cell count of more than 2000/µl (2 x 10^9/l) and platelet count of more than 15 x 10^9/l before commencing the next course (8). Remission is diagnosed after a patient achieves three consecutive weekly ß-hCG titre of less than 10 miu/ml and sustained remission if repeated ß-hCG titres at monthly interval remain negative for one year (4). In our unit the practice is to give two to three more courses of chemotherapy once the ß-hCG level is negative. This was done for this patient once remission was achieved.

The EMA-CO regime consisting of Etoposide, Methotrexate, Actinomycin D, cyclophosphamide and Vincristine is the preferred primary treatment of patients with metastasis and a high prognostic score (> 8) as well as MAC treatment failure (1,6). In salvage therapy for disease not responding to EMA-CO the cyclophosphamide and vincristine is substituted with cisplatin and etoposide (EP-EMA). If the patient does not desire fertility, hysterectomy with adjuvant chemotherapy may be performed as primary treatment. The patient presented desired future fertility so hysterectomy was not performed.

Cerebral metastasis usually spell a grave prognosis for the patient (1). When chemotherapy for primary disease is started these tumours undergo haemorrhage and necrosis, and this probably contributes significantly to mortality during treatment (11). Better results are got with total brain irradiation with 3000–4000 rads at a rate of 200 rads/day for 5 days over a period of 2 weeks combined with chemotherapy (1,11). Alternatively the 3000 rads can be given in 200 rads fractions over 10–14 days during chemotherapy.

After completion of chemotherapy, patients are followed up by serial ß-hCG estimations. The patient must use an effective contraceptive (combined oral contraceptive pill is preferred) to avoid pregnancy for at least 12 months (12). This period allows for full metabolism and excretion of the chemotherapeutic agents, mature ova affected by

chemotherapy to be eliminated as well as monitoring for relapse. Pregnancy is achieved once contraception is stopped in most patients. There is no increase in risk of abortion or congenital malformations (12). Recurrent H-mole develops in 1:50–1:150 pregnancies and women with previous gestational trophoblastic disease (GTD) are at 10–20x increased risk of GTD than women who have never had GTD (1). Occasionally GTD can occur or recur after a subsequent normal pregnancy (2).

Placental site trophoblastic tumor is resistant to chemotherapy. Surgical removal of the tumor by hysterectomy is the recommended mode of management with EP-EMA (1) but paclitaxel and topotecan used when resistance develops (6,13). It is important to ascertain the mode of origin of choriocarcinoma because chemotherapy selection is contingent upon whether the tumor is of gestational versus nongestational derivation. For example, it is described that gestational choriocarcinoma has a significantly better therapeutic response and prognosis than does non-gestational ovarian choriocarcinoma (14).

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Case 7: Voluntary surgical contraception – Bilateral Tubal Ligation

Name	: C.A.	**Date of admission**	: 30 Jul. 2003
Age	: 38 years	**Date of discharge**	: 30 Jul. 2003
I.P. No.:	0880076		

Presenting request

The patient presented to the family planning clinic and requested for Voluntary surgical contraception by bilateral tubal ligation.

Presenting history

She was a para 4+0, whose L.M.P. was 15 Jul. 2003. The menses were regular with no dysmenorrhoea.

Her 1st delivery was in 1990 at age of 25 years, and last delivery was in 2000 to twins. She had of 5 living children, 3 male and 2 female. She had used other methods of contraception; the last one used was oral contraceptive pills, which was stopped because of hypertension. She had previously used an intrauterine device (IUCD), and Depo-medroxyprogesterone acetate (DMPA) injection. She had been using oral contraceptives since 2000 after her last delivery. Her blood pressure was noted to have risen to 150/90 mmHg in June 2003, from previous value of 110/70 mmHg. The contraceptive was stopped and the BP had settled to 120/80 mmHg. She and her husband had been counselled on the other methods available and they voluntarily chose permanent sterilization method by bilateral tubal ligation.

A pap smear done in September 2002 was normal.

Past medical history was non-revealing.

Family and social history

She was a married homemaker. She lived with her husband who was a farmer in Thika. She did nor take alcohol nor smoke cigarettes. There was no history of chronic illness in the family.

Systemic inquiry was non-revealing

Physical examination

She was a middle-aged woman in fair general condition, not pale; she had no jaundice, no oedema, no cyanosis and no lymphadenopathy. The vital signs were: Blood pressure 120/80 mmHg, Respiratory rate 20/min, Pulse 88/min and Temperature 36.5°C.

Respiratory, cardiovascular and central nervous systems were essentially normal.

Abdominal examination

The abdomen was scaphoid, with no therapeutic or surgical scars. There was no hepatosplenomegaly. There were no any other abnormalities detected.

Pelvic examination

Speculum examination showed a normal external genitalia; the cervix was healthy grossly with a parous os. A digital examination found the uterus was anteverted and felt of normal size and freely mobile. The adnexa and pouch of Douglas were free. Cervical excitation test was negative. There was a normal whitish discharge on the examining finger.

Diagnosis

Desired family size willing to undergo voluntary surgical contraception with no contraindication.

Management

She was scheduled for Interval tubal sterilization using mini laparotomy under local anaesthesia. She was further counselled and informed consent signed in the VSC booklet and she was scheduled for Voluntary surgical contraception through mini-laparotomy and bilateral tubal ligation by Pomeroy's technique. She was asked to come on the morning of the operation accompanied by a mature responsible close relative or friend or husband. She was asked not to have any solid meals for a period of 12 hours prior to the operation time, and take nothing orally on the morning of the operation.

Investigations

Her last menstrual period was on 15.7.2003. A pregnancy test was done on 29/7/2003 and was negative.

Procedure

She reported on 30/7/2003 at 8 in the morning and she was re-examined and found to be fit for the operation. The blood pressure was 120/70 mmHg, pulse was 78/minute; temperature was 37.2°C, respiratory rate was 20/minute. She was then taken to theatre, she was explained that the procedure is done under local anaesthesia and she would be asked at times to draw in her abdomen to facilitate tube retrieval. She was put in semi-lithotomy position and vulvo-vaginal toilet done a speculum was inserted and the cervix exposed, the uterine elevator was introduced aseptically. The patient was then put in supine position and abdomen cleaned and draped. Using the uterine elevator, the area of the uterine fundus was noted on the abdomen, then an area of 2 cm below the uterine fundus was noted and using 20 mls of 2% Lignocaine, local superficial and deep infiltration was done. A pinprick test revealed good anaesthetic effect. A transverse minilap incision measuring 3 cm was made on the site, using blunt dissection, the rectus sheath was identified and a small nick made, and extended to 4cm using scissors, again by blunt dissection, the peritoneum was identified, was held by long-artery forceps and divided. With the help of the uterine elevator, the uterine fundus was easily identified, the table was put Trendlensberg position, the patient was asked to draw in her abdomen which she did, the right tube was identified and picked using the hook, it was held using a Babcock in the area of the isthmus, the tube was "walked" externally and the fimbrial end identified, the tube was ligated using chromic catgut 1 by Pomeroy's technique, hemostasis was achieved. The left tube was also easily retrieved and the same procedure repeated. The bed was put in normal position and the abdomen closed. There was minimal oozing of blood. The whole procedure lasted 25 minutes.

The patient was then taken to the recovery ward. The observations were normal The blood pressure was 120/80 mmHg, the temperature was 37.0°C, the pulse was 80/minute and respiratory rate was 18 per minute. She was allowed home after 3 hours. She was given Amoxycillin and ibuprofen each for 5 days and asked to come back for review after 7 days. On review after 7 days she had no complaints, she was doing well and the wound had healed. She was given a follow-up appointment to be seen when need be.

Discussion

The patient presented was a para 4+0, whose last delivery was in 2000, she had been using oral contraceptives but developed hypertension, therefore the pills were stopped and now she desired permanent contraception by bilateral tubal ligation. She was evaluated and found to be suitable and bilateral tubal ligation by Pomeroy's technique was performed via mini-laparotomy under local anaesthesia. Her recovery was unremarkable.

Bilateral tubal ligation (BTL) is a surgical permanent method of contraception also known as tubal sterilization. Tubal sterilization was first performed in 1823 to prevent pregnancy in women who would need repeated Caesarean sections during childbirth (1). Since then many modifications have taken place and it is offered to women who have desired family size and want a permanent method of contraception (2). Other indications include women in whom a pregnancy could represent a significant clinical and medical risk such as, patients with diabetes with severe vascular complications or severe cardiac disease. In Kenya it is not clear when tubal sterilization was introduced. However it has gained popularity alongside other modern methods of contraception. At KNH and probably among a wide range of women in Kenya, one of the reasons given by the women who decline BTL even when it is indicated on medical grounds, is the myth that (mwili inakua baridi) " one becomes cold in bed", this may mean either that they don't enjoy sex or they never reach orgasm, this phenomenon perhaps requires further review.

The contraceptive prevalence rate for Kenya is 39% and most current users of contraceptive use a modern method; about 32%, while 8% use traditional methods (considered less effective for the prevention of unwanted pregnancy), Injectables and pills are the most commonly used contraceptive methods; they are currently used by 12 % and 9% of married women respectively. Six percent of married women have been sterilized, 3% are using IUCD, 1 percent are each using condom and implants. Use of male sterilization and vaginal methods (diaphragm, foam, et cetera) is rare. Periodic abstinence is used by 6%, withdrawal 1% and other traditional methods by 1%. Contraceptive use, especially modern methods has risen sharply since 1980s and is probably the principal cause of the fertility decline. The total fertility rate has declined from 8.1 in mid 1970s to 4.7 children per woman a decline of 42% over a 20-year period (3).

Tubal sterilization is indicated for women who want a permanent method of contraception and are free of any gynaecologic pathology that would otherwise dictate an alternate procedure. The patient presented had desired family size and did not have any gynaecologic pathology and interval sterilization was performed. Generally BTL is performed in the immediate postpartum period (within 7 following vaginal delivery) or in the interval (after 42 days postpartum when the uterus is fully involunted) (4). In comparison to interval sterilization, BTL following delivery in the early puerperium is convenient, simple, and cost effective. BTL may be performed after closure of the uterine incision during Caesarean section. Postpartum BTL is technically simple because the uterine fundus is at the level of the umbilicus, making the fallopian tubes readily accessible through a small periumbilical abdominal incision (5). If the procedure is delayed for several days or if the patient has a significantly involuted uterus (as might occur after delivery of a preterm infant), then delaying to an interval procedure usually is prudent because of increased risk of sepsis (4).

Surgical approaches to BTL include laparoscopy; minilaparoscopy; laparotomy (concomitant with Caesarean section) mini-laparotomy and vaginal approaches. In KNH mini-laparotomy and at Caesarean section are the commonest approaches but laparoscopy is also done. Local anaesthesia is generally used during mini-laparotomy. The patient presented had a mini-laparotomy under local anaesthesia. Informed consent and preoperative counselling is very important, inform the patient (ideally the couple) that the procedure is intended to be permanent and irreversible, that a small chance of failure exists, and that the relative likelihood of ectopic pregnancy is increased when sterilization failure occurs. Screen for risk indicators for regret, including young age, low parity, single parent status, or marital instability. Stress the need to use condoms for protection against sexually transmitted diseases and human immunodeficiency virus infection if patient is at risk of exposure.

Many surgical techniques for accomplishing tubal ligation have been described. Pomeroy's technique is the simplest and most commonly performed puerperal tubal sterilization. The mid-portion of oviduct is grasped with a Babcock clamp, creating a loop, which is tied with 2, 1 or 0 chromic catgut suture, and each limb of the tubal knuckle, is cut separately. Specimens are submitted to histopathology. The endosalpinx at the cut ends may be cauterized (optional). The ligation sutures are held while the

tube is cut to prevent retraction of the cut tubal stumps into the peritoneal cavity before they can be adequately examined for hemostasis (6,4,5). Failure rates are reported to be 1 in 300-500 patients (7). Other techniques include: the Parkland technique, the Parkland technique is a mid segmental resection similar to the Pomeroy's technique, except each leg of the loop is tied separately. Others are: The Uchida technique; the Irving technique; Electrocoagulation technique; bipolar current and, unipolar current. Mechanical techniques of tubal sterilization include: Falope (Yoon) ring technique; the Hulka-Clemens clip technique and the Filshie clip technique, silicon rubber bands, spring clips, Filshie clip (8,9). Currently there are there is a bias towards using transcervical hysteroscopy to aid in sterilization. Chemical plugs such as quinacrine, microcoils (spring-like device inserted into the tubes) and the Adiana procedure (a transcervical catheter is inserted into the fallopian tubes and this is used to apply low-level radiofrequency energy, creating a superficial lesion into which a porous plastic implant called a matrix is placed. These procedures generally cause tubal scarring with subsequent closure of the tube (10).

Follow-up care both in the immediate and long-term is very important. The follow-up visit is usually 1-2 weeks postoperatively. In KNH it is usually after 10 days. Instruct the patient to notify her health care provider if she develops fever (38°C or 100.4°F) or chills, increasing or persistent abdominal pain, or bleeding or purulent discharge from the incision. Women who have undergo sterilization are informed about the signs and symptoms of pregnancy (for example, ammenorrhea, vaginal bleeding/spotting, abdominal pain) and ectopic pregnancy and advise these women to seek immediate medical attention if such signs occur (8).

Some complications may arise during tubal sterilization, such as, mortality. The risk of death from tubal sterilization is 1-2 cases per 100,000 procedures; most of these are complications of general anaesthesia. The most common cause of death during laparoscopic BTL appears to be hypoventilation related to anaesthesia. Cardiopulmonary arrest and hypoventilation were reported as the leading cause of death in most cases. Sepsis as a cause of death from laparoscopic sterilization is directly related to bowel perforations or electrical bowel burns. Unintended laparotomy occurs with 1-2% of laparoscopic procedures; most of these conversions are attributable to technical inability to complete the laparoscopic procedure rather than to complications of the procedure

(4,8). Bowel injury can occur during insertion of the insufflation needle or trocar or during electrocoagulation. Vascular injury can occur during insufflation needle or trocar insertion. Injury to a large vessel is a life-threatening emergency (11).

BTL failure (pregnancy or ectopic pregnancy) can occur. Although sterilization is highly effective and considered the definitive form of pregnancy prevention, it has a failure rate during the first year of 0.1-0.8%. At least one third of these are ectopic pregnancies. Recent findings suggest that pregnancy is somewhat more common than previously estimated, that the risk of pregnancy persists for many years after sterilization, and that the risk varies by method and patient age at sterilization (7,11,12). Sterilization failures can be grouped into the following 4 categories: Luteal phase pregnancy is defined as a pregnancy in which conception occurs before the BTL, but pregnancy is diagnosed after an interval tubal sterilization (12). Misidentification of the oviduct because of poor visualization from inadequate exposure, adhesions, adnexal pathology, or poor lighting may result in mistakenly ligating the round ligament, ovarian ligament, infundibular ligament, or dilated broad ligament blood vessels instead of the oviduct. Incomplete occlusion of the oviduct occurs because of poorly placed mechanical clips or the use of mechanical devices on edematous or dilated tubes. Incomplete tubal occlusion with electrocoagulation generally is associated with too brief an application of current or with the use of modulated/coagulation current instead of unmodulated/cutting current. Other complication include; pain, infection/haemorrhage; wound infections and hematoma have been associated with mini-laparotomy. Pelvic infections and hemorrhage are associated with vaginal approaches. In KNH patients are given prophylactic antibiotics and analgesics for pain relief after the procedure. Organ injuries can occur from sharp trauma (for example, insufflation needle, trocar, scalpel), blunt trauma (e.g., from adhesionolysis), or electrical-thermal trauma (8,9).

BTL is intended to be permanent, but patient regret is not rare. Poststerilization regret is a complex condition often caused by unpredictable life events. Risk factors for regret that may be useful in presterilization counselling include young age, low parity, and single parent status or being in an unstable relationship. As many as 6% of women who are sterilized report regret or request information about tubal reversal within 5 years of the procedure. Follow-up interviews 14 years postprocedure demonstrated that regrets were expressed by 20.3% of women aged 30 years or younger at the time of BTL and

by 5.9% of women older than 30 years at time of procedure (6,9,13). The proportion of women who actually undergo microsurgical tubal reanastomosis is only 0.2% in the first 5 years after BTL. The most important factor in determining the success of reversal by tubal anastomosis is the length of normal tube remaining after sterilization. Isthmic-to-isthmic anastomosis are most likely to be successful (9).

BTL also confers some noncontraceptive benefits; such as decreased risk of ovarian cancer. Several studies report a protective effect of sterilization against ovarian cancer, with a relative risk ranging from 0.2-0.8. Protection is hypothesized to result from reduced exposure of the ovaries to potential environmental carcinogens and infectious sources of malignant transformation (for example, oncogenic viruses) (9,14). Although BTL does not protect against the acquisition of sexually transmitted disease, sterilization has been demonstrated to reduce the spread of organisms from the lower genital tract (LGT) to the peritoneal cavity and thus protect against pelvic inflammatory disease (15).

The question regarding the existence of a post-tubal ligation syndrome was proposed in 1951, this syndrome is a controversial constellation of symptoms, including pelvic discomfort, ovarian cystic changes, and menorrhagia, which are suggested to occur as a result of disruption of the utero-ovarian blood supply, with resultant disturbances of ovulatory function after BTL. Often, these patients have history of above problems before BTL or have been taking birth control pills, which masked their symptoms (9,16). After extensive study, BTL apparently causes few, if any, menstrual abnormalities within several years after sterilization, regardless of the method of tubal occlusion used. Data from the U.S. Collaborative review of Sterilization in 2000 found that women who are tubally sterilized were no more likely than women who had not undergone the procedure to report intermenstrual bleeding or changes in menstrual cycle length. Women who were sterilized were, however, more likely to report a reduced number of days of bleeding, less overall bleeding and menstrual pain, and increased cycle irregularity. BTL also seemed to help reduce blood flow in women who reported very heavy menstrual bleeding at baseline (7).

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Case 8: Cancer of the ovary – laparotomy, chemotherapy

Name	: M.W.	**Date of admission**	: 20 Feb. 2005
Age	: 48 years	**Date of discharge**	: 10 May 2005
I.P. No.:	0993772		

Presenting complaints

She was first seen in the gynaecology outpatient clinic on 4/2/2005 as a referral from Machakos District Hospital with a provincial diagnosis of cancer of the ovary. She had presented with complaints of lower abdominal pains, progressive lower abdominal swelling for the past 3 years.

History of presenting complaints

She was previously well when she noted lower abdominal swelling followed later with dull pain on and off. There was a positive history of weight loss, with reduced appetite. Bowel and micturation habit were essentially normal. She had been treated at various primary care facilities without much relief. She had done an ultrasound scan that had reported a right ovarian mass (no details available).

Obstetrics and gynaecology history

She was a Para 1+0 with one living child. She delivered by SVD in 1979. She had her menarche was at 14 years, the menses were irregular and heavy sometimes with clots, but she had no dysmenorrhoea. She had never used any contraceptives.

Family and social history

She was a married living with her spouse in Machakos. She did not smoke or take alcohol. There was not history of chronic illness like diabetes mellitus, hypertension, pulmonary tuberculosis or chronic cough in the family. She had no history of contact with a person with chronic cough or pulmonary tuberculosis. There was no history of a similar illness in her family.

Past medical history

There was no history of admission to hospital. She had been treated severally in a nearby outpatient in health centres in Machakos for complaints of lower abdominal swelling, menstrual irregularity and most recently lower abdominal pain.

Systemic inquiry

She denied any history of weight loss, lassitude, and loss of appetite or constipation.

Physical examination

She was a middle-aged lady in fair general condition, was wasted, not pale, she had no lymphadenopathy, no oedema and no jaundice. Vital signs were: Temperature 37°C; pulse 80/min; BP 110/70mmHg, respiratory rate 22/min.

Respiratory, Cardiovascular, and central nervous systems were essentially normal.

Abdominal examination

The abdomen was distended in the lower half. There were no visible vessels, nor skin changes. There were several theraputic scars. There was a irregular mobile, non-tender mass corresponding to about 26 weeks' uterine size over the suprapubic and umbilical region. There was no hepatosplenomegally but there was a positive fluid thrill.

Pelvic examination

She had a normal external genitalia, with normal female inverted-triangle hair distribution, the cervix was posterior, the uterus felt bulky and displaced to the left. The right adnexa was full with a cystic mass, the Pouch of Douglas and the left adnexa were full and there was slight tenderness on cervical excitation test. There was a whitish discharge on the examining finger.

Impression

An impression of ovarian mass most likely carcinoma was made.

Management

Investigations

1. Abdominal and pelvic ultrasound 24/2/2005: There was a huge septate right adenexal mass measuring 15 x 11.6 x 12 CM. The mass was complex with mixed hypoechoic and cystic areas. The wall was thickened and hypoechoic. The uterus appeared normal and was displaced anteriorly. There were no uterine fibroids. There was no hydronephrosis. Ascites was present. Comparison made with a previous scan of Nov. 2004 (provided by the patient) showed the mass had increased in size significantly. CONCLUSION: right ovarian cystadenocarcinoma.

2. Hemogram: Hb 8.6 g/dl, WBC 4.9 x 10^9/l, Platelets 258 x 10^9/l.
3. Blood chemistry: Na+ 132 mmol/l, K+ 3.5 mmol/l, Urea 3.5 mmol/l.

Treatment

She was scheduled for admission in the elective gynaecology ward for exploratory laparotomy, staging, debulking and biopsy for histology. She was transferred to ward 1B from 1D for laparotomy.

Physical examination (was as described above)

She was worked up for laparotomy. She was transfused 2 units of blood over the next 2 weeks. She missed theatre severally due to lack of blood for transfusion. Ascitic tap was done 3 times while she awaited theatre. The fluid was taken for cytopatology. Subsequently the repeat investigations showed:

1. Hemogram: Hb 10 g/dl, WBC 4.9 x 10^9/l, Plat 258 x 10^9/l
2. Blood chemistry: Na+ 142 mmol/l, K+ 3.5 mmol/l, Urea 4.5 mmol/l
3. Coagulation profiles were normal.
4. Ascitic tap for cytopathology: No results were received.

Informed consent was obtained. She was fasted overnight. On the morning of the operation, premedication IM atropine 0.6 mg was given 1/2 an hour before she was taken to theatre.

Procedure

In theatre, the patient was put on the table in semi-lithotomy position, the vulva was cleaned and catheterization done. Examination under anaesthesia confirmed the ward findings. The patient was then placed in the supine position; the abdomen was cleaned and draped then opened through a lower midline incision.

Findings

There were enlarged abdominal wall veins. Ascites fluid volume was about 2 litres. There was a mass arising from the left ovary. It was adherent to the omentum superiorly and part of the small intestines. The mass was well encapsulated with a smooth surface capsule. The right ovary was grossly normal. The nearby omentum, gut and liver looked healthy.

Done

Aspiration of the ascitic fluid was done. Total abdominal hysterectomy and bilateral salphingo-ophorectomy (TAH BSO) and partial omentectomy was done. The liver, spleen and kidneys were palpated and found to be normal. The pelvic and para-aotic lymph nodes were not enlarged. Specimens were taken for histopathology. The instruments and swabs were counted they were correct. The abdomen was closed by mass-closure technique. Anaesthesia was reversed successfully. She was transfused 1 unit of blood postoperatively. The wound healed well and her postoperative period was generally uneventful.

Tissue histology.(26/5/2005): showed features consistent with those of a moderately well differentiated cystadenocarcinoma. Cytology for ascitic fluid was not found.

Diagnosis

Epithelial cancer of the ovary, Stage III C

Management plan

She was planned for work-up and cytotoxic multidrug chemotherapy.

Investigations

1. Hemogram: Hb 9.6g/dl, WBC 11.3 x 10^9/l, Plat 346 x 10^9/l.
2. Blood chemistry: Na+ 134 mmol/l, K+ 4.0mmol/l, Cl- 106 mmol/l, Urea 6.8 mmol/l, Creatinine 102 µmol/l.
3. Liver function tests: Total protein 66 g/l, Albumin 37g/l, SGT 18 IU/l, ALT 8 IU/l, AST 27 IU/l, Total bilirubin 10.7µmol/l, Direct bilirubin 2.6µmol/l.

She was blood group O positive and was transfused one pint after cross-matched. Check Hb was 11.5g/dl and was also commenced on haematinics.

Chemotherapy

i) Cisplatin 50mg on day one only, ii) Adriamycin 50mg on day one only,
iii) Cyclophosphamide 500mg daily for 5 days.

The treatment cycles were to be repeated every 4 weeks. The first course of treatment was started on 6/6/2005. She completed the first course and was discharged home on haematinics. She was readmitted on 4/7/2000 for the second course. She however stayed

in the ward until this date. She complained of a feeling that the mass was growing again on the left side.

Physical examination revealed her to be in fair general condition, not febrile, not pale; she had no lymphadenopathy, no oedema and no jaundice.

Respiratory cardiovascular and central nervous system were essentially normal.

Abdominal examination revealed a well healed wound. The abdomen was not distended. There was no hepatosplenomegally; there was no ascites.

Pelvic examination done showed normal external genitalia. The vaginal vault was healed with no palpable masses. There was a whitish discharge on the examining finger. A vault swab for culture and sensitivity was negative of any growth.

Blood parameters were normal therefore cytotoxics were given. She received a 2nd course of cytotoxics and completed treatment on 10/7/2005. As this case was being summarised she was still continuing with her chemotherapy.

Discussion

Of all the gynaecologic cancers, ovarian malignancies represent the greatest clinical challenge. Ovarian cancer represents a major surgical challenge, requires intensive and often complex therapies and it is extremely demanding of the patients psychological and physical energy. It has the highest fatality-to-case ratio of all the gynaecological malignancies. Epithelial cancers are the most common malignancies, and because they are usually asymptomatic until they have metastasized, patients present with advanced disease in more than 2/3 of the cases (1). This patient had an epithelial tumour that had a very indolent course and at the time of surgery it had already spread to the abdominal organs.

Approximately 1 in 70 (1.4%) newborn girls will develop ovarian cancer during their lifetime. In general ovarian cancer is a disease of the postmenopausal woman and prepubescent girl, although it is documented to occur in females of all ages (1,2). Cancer of the ovary accounts for about 25% of all malignant neoplasms of the female genital tract. Over 50% of deaths ascribable to gynaecologic cancer are due to cancer of the ovary. Cancer of the ovary is the fifth leading cause of cancer-related morbidity among American women accounting for 5% of all such deaths (3) and is the leading cause of death from gynecologic malignancies (1). At KNH, Njuki (1979) found that cancer of the ovary comprised 8% of all female genital malignancies and ranked third as a cause of gynaecologic malignant disease after cancer of the cervix and choriocarcinoma (3). Karanja (4) on the other hand found similar results.

The incidence of ovarian cancer is highest in Scandinavian countries 14.9/100,000 and lower in Japan 2.7/100,000 (1). Incidence increases with age (with the exception of teratomas and special sex cord tumours). Ovarian neoplasms are commonly found in women aged 45–75 years (1). Njuki in his study found an age range of 9–63 years while Ojwang and colleagues at the same hospital found an age range of 40–60 years with a mean age of 46.7 years (4,5). The patient presented was 48 years old.

Aetiology of ovarian cancer is unknown. The factors associated with an increase in ovarian cancer are: age, exposure to industrial agents like asbestos and talc, high fat diet, women of low parity or nuliparity, infertility and delayed child-bearing and early menarche are also at increased risk. Other risk factors include use of fertility drugs like Clomiphene, family history of ovarian cancer (seen in 5% of cases of ovarian cancer)

and family history of breast cancer (1). Patients with Turner's syndrome (45X0) are at increased risk of dysgerminoma and gonadoblastoma. The presence of Y-chromosome as found in Turner's syndrome with mosaicism (45X0, 46XY) and Klinefelter's syndrome (XXY), further increases the risk. Other genetic disorders associated with increased risk include, the familial occurrence of teratomas and the increased incidence of sex cord tumours in patients with Peutz-Jeghers syndrome. Although most cases of epithelial ovarian cancer are sporadic and exhibit no heritable tendencies, approximately 7% occur in women with a suggestive family history. The most common pedigrees are sister/sister and mother/daughter patterns. Three heritable syndromes have been described: (i) Site specific ovarian cancer; (ii) Familial cases of breast and ovarian cancer; (iii) Cancer family syndrome characterised by the occurrence of colon cancer and adenocarcinoma of the ovary, breast, or uterus or a combination also know as Lynch II syndrome (hereditary nonpolyposis colon cancer syndrome) vs Lynch I (familial colon cancer) (2,6). Persons affected by one of the heritable ovarian cancer syndromes are typically diagnosed in the fifth decade of life with poorly differentiated bilateral ovarian neoplasms (1). Molecular biologic studies suggest the presence of one or more tumour suppressor genes on chromosomes 17, which may play a role in the aetiology of this disease (2).

There is a 40% decrease in risk of ovarian cancer following a woman's first pregnancy and an estimated 14% decrease in risk for each subsequent pregnancy (6). Other protective factors are use of oral contraceptives, breast-feeding (2) probably due to reduction in the frequency of ovulation. Patients who have undergone bilateral tubal ligation and hysterectomy are at decreased risk though the mechanism is unknown but postulated to be prevention of ascent of potential oncogenic factors from the lower genital tract to the ovary (l). The patient presented was para 1+0 and had not used contraceptives.

There are three major types of ovarian neoplasms. Epithelial tumours account for 70-80% of all ovarian neoplasms while 10% are stromal in origin and 5% are germ cell tumours (2). In children, the most common tumours are malignant germ cell tumours while epithelial tumours account for more than 90% of all adult cases (6). Serous and muscinous cystadenocarcinoma are the most common types of invasive epithelial ovarian tumours. They comprise 60% of all primary tumours of the ovary

and 90% of those that are malignant (7). The patient presented had well differentiated adenocarcinoma of the ovary.

Except for those tumours that have endocrine function, ovarian tumours are rarely symptomatic other than those symptoms induced mechanically by the size of tumour. Thus most are often inoperable by the time of diagnosis (4,7,8). The patients' ignorance due to lack of education and non-availability of health care in remote areas of the country also contributes to late diagnosis (4). Symptoms include abdominal swelling from large tumour or associated ascites, dyspepsia cachexia, urinary retention, bowel obstruction and aching pain in the abdomen . On physical examination, a pelvic mass that is bilateral, irregular, solid or fixed is suggestive of malignancy. The patient presented had progressive abdominal swelling, weight loss, night sweats and backache. On physical examination she had massive ascites but no mass ballotable.

Laboratory evaluation of these patients includes a complete blood count, liver function tests, urea and electrolytes, coagulation profile and cervical cytology. Intravenous urography may be indicated to define the ureters and exclude a pelvic kidney. Barium enema is done to rule out colonic involvement or colonic cancer. Chest X-ray is done to detect pleural effusion or metastatic disease. Ultrasound or CT-scan of the pelvis may be done but the ultimate diagnosis depends on surgical exploration (2,6). The patient presented was done full blood count, urea and electrolytes and liver function tests, which were normal. Ultrasound showed an irregular tubo-ovarian mass. Chest X-ray was normal.

Carcinoma of the ovary is staged according to the International Federation of Gynaecology and Obstetrics classification of ovarian neoplasms (6).

Stage I Growth limited to the ovaries

Ia Growth limited to one ovary, no ascites, capsule intact

Ib Growth limited to both ovaries, no ascites, capsule intact

Ic Ia or Ib and ovarian surface, ruptured capsule, malignant ascites present with malignant cells, peritoneal cytology positive for malignant cells.

Stage II Growth involving one or both ovaries with pelvic extension.

IIa Extension and/or metastasis to the uterus and/or tubes and/or the other ovary

IIb Extension to other pelvic tissues, ruptured capsule, malignant ascites present with malignant cells, peritoneal cytology positive for malignant cells.

Stage III Growth involving one or both ovaries with widespread intraperitoneal metastasis

IIIa abdominal peritoneal surfaces with microscopic metastasis

IIIb tumor metastasis <2cm in size

IIIc tumor metastasis >2cm or metastatic disease in the pelvic, para-aortic, or inguinal nodes

Stage IV Growth involving one or both ovaries with distant metastasis.

Malignant pleural effusion

Pulmonary parenchymal metastasis

Liver or splenic parenchymal metastasis (not surface implants)

Metastasis to the supraclavicular lymph nodes or skin.

The patient presented had stage IIIc disease because she had omental and intestinal implants as well as ascites.

At present the two most effective screening methods for ovarian cancer are transvaginal sonography and serum Ca-125. However, these are non specific and have a low catch rate for early disease (2,6). Tumour markers are useful in diagnosis and management of serial ovarian tumours. Lactic acid dehydrogenase has been found elevated in ovarian cancer although in most instances advanced disease is present. CA-125 is an antigen produced by most primary ovarian malignancies though raised levels may also be found in other malignancies and benign conditions (8,9). CA-125 assay has been used in identification of extent of intraperitoneal disease though the technique has not allowed diagnosis of early disease (3). Other markers include alpha fetoprotein, human chorionic gonadotropin, carcinoembryonic antigen (CEA) (6), lactic dehydrogenase 1 and 2, and inhibin (1). These are summarised below:

Epithelial ovarian cancer:	CA-125, NB 70K, LASAP.
Gestational trophoblastic disease	ß-hCG
Dysgerminomas	LDH-1, LDH-2
Embryonal cell carcinoma	hCG, AFP
Endodermal sinus tumour	AFP, LDH
Sertoli-leydig	Testosterone
Granulosa cell tumours	Inhibin, Estradiol
Endometrial carcinoma	CA-125
Mucinous cystadenocarcinoma	CEA (2,9)

Surgery is usually performed to establish the type, histologic grading and stage of tumour (1,3). During surgery, the incision should provide maximum exposure of the pelvis allow thorough examination of the abdomen. If ascites is present, it should be aspirated and taken for cytology. If ascites is absent, peritoneal washings are obtained from the pelvis, right and left paracolic gutters and suprahepatic space by instillation of 100mls of normal saline into each area (2). Other Surgical procedures may include: small bowel resection or bypass, large bowel resection, partial gastrectomy, splenectomy, ureteral resection, debulking of diaphragm or liver, iliac and aortic vessel, or intestinal metastasis (4). There should be complete abdominal inspection and palpation. The operation aims at resecting as much tumour as is safely possible. Total abdominal hysterectomy, bilateral salpingo-oophrectomy and omentectomy is the preferred basic treatment for ovarian cancer (3). Concurrent random peritoneal biopsies and retroperitoneal lymph node sampling should be done (2,3,6). Fertility-sparing surgery is done to young women <40 years old in stage Ia disease and who wish to bear children. It should be however practised if conservation of the ovary does not compromise on cure (2), with full knowledge of the patient and her family and the possible implications of the surgery.

Postoperative chemotherapy (adjuvant therapy) is given. Generally a pulse therapy regime is used. This involves five days of chemotherapy per month for up to 12 courses. Drugs used include Cyclophosphamide, Cisplatin, Melphalan and Chlorambusil. Multidrug chemotherapy has been reported to result in excellent response. In our setup Cisplatin, Cyclophosphamide and Adriamycin are commonly used and the patient presented was started on this regime.

Second look laparotomy is done to evaluate the antitumour effect of chemotherapeutic agents, to determine the timing of cessation of chemotherapy, or to debulk the residual tumour after incomplete surgery (1,2,9). It is usually performed after six to twelve courses of chemotherapy. Response to chemotherapy can also be monitored by serum levels of CA-125. Rising levels of CA-125 are associated with progression of disease. It can aid in early identification of non-responders to chemotherapy (2,10). The value of the second look therefore is; (i) To discontinue all chemotherapy if there is no evidence of disease; (ii) To determine the actual surgical and pathologic response to cisplatin based chemotherapy if cisplatin is to be used as part of second line chemotherapy and, (iii) If possible to deal with any residual disease to achieve the same theoretic benefits described for primary debulking surgery. The patient presented could not afford to have CA-125 levels done.

Radiotherapy, when used alone is of no benefit in ovarian carcinoma. The dose required to irradiate the upper abdomen postoperatively would not be tolerated by the liver and kidneys (3). It is reserved for germ cell tumors (dysgerminomas) and residual tumour size should be 2cm or less. Radioactive isotopes such as intraperitoneal P32 may be of benefit in patients with stage Ic disease and those with microscopically positive second-look operations.

During therapy, the patients are seen monthly. A full hemogram, liver function tests, renal function tests and chest X-ray are done. A pelvic examination to assess disease status is done on monthly basis. Patients who have completed therapy and who are disease free are evaluated every 2-3 months for two years. Thereafter, they are evaluated every six months.

The overall five-year survival rate for ovarian cancer remains poor at about 30%. Survival is much better (75% at 5 years) for women who present when the disease is localised to the ovaries (FIGO stage I) (2). However, most women present at later stages of the disease. Screening methods including ultrasound and CA-125 are being tried in the hope that cancer can be detected in asymptomatic women thus leading to early treatment. There has been no evidence on whether screening improves outcome for women in any risk group (8). Prophylactic oophorectomy is being proposed especially for patients with a family history of ovarian cancer, though it is still questionable whether a significant impact can be made on cancer related mortality (1,3).

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Case 9: Vesico-vaginal fistula – successful repair

Name	: E.M.	**Date of admission**	: 5 May. 2005
Age	: 20 years	**Date of discharge**	: 13 May. 2005
I.P. No.:	0993775	**Parity**	: Para 1+ 0

Presenting complaints

She was admitted to the cold gynaecology ward through the VVF outpatient clinic with complaints of leakage of urine for 6 months.

History of presenting complaint

She had delivered by Caesarean section at a hospital in Kakuma camp due to prolonged obstructed labour. The baby was a still birth but she did not know the birth weight. She developed leakage of urine and stool on the third postoperative day. She had a urinary catheter up to the fifteenth postoperative day.

Past medical history

She had an initial fashioning of colostomy then had attempted repair in February 2005. The RVF took but the VVF did not take. The colostomy was refashioned in March 2005. She had no history of chronic illness or drug allergy.

Obstetric and gynaecology history

She was para 1+0. Her menarche was at 17 years. Menses lasted 3-4 days and cycles were 28 days, regular. There was no dysmenorrhoea. However, she had not resumed menses since her last delivery. She had not used contraceptives.

Family and social history

She was a single living in a refugee camp. There was no family history of chronic illness. She did not drink alcohol or smoke cigarettes.

Physical examination

She was in good general condition and had no pallor jaundice, edema or lymphadenopathy. Her blood pressure was 120/70 mmHg, pulse rate 82/minute regular, respiratory rate 20/minute and temperature 36.5°C.

The cardiovascular, respiratory and central nervous systems were examined and found normal.

Abdominal examination

The abdomen had normal fullness and moved with respiration. She had a subumbilical midline scar of the previous Caesarean section and a right paramedian incision from the previous colostomy. There was tenderness on palpation and no masses.

Pelvic examination

The external genitalia was normal with a healed episiotomy scar. The perineum was excoriated, wet and had pungent smell. On speculum examination the anterior wall of the vagina had a mid-vaginal defect about 0.5 cm through which urine drained into the vagina. The posterior vaginal wall was normal. The cervix was long, posterior and the was closed. There was no vaginal discharge.

Diagnosis

A diagnosis of vesico-vaginal fistula was made and she was planned for repeat by vaginal route.

Investigations

1. Hemogram: Hb 1 2g/dl, WBC 9.0 x 10^9/l, RBC 5.2x10^9/l, Plat 351 x 10^9/l.
2. Biochemistry: Sodium 133 mmol/l, Potassium 4.8 mmol/l, Urea 5.0 mmol/l.

Management

The diagnosis and mode of management were explained to the patient. Informed consent for repair of VVF in theatre was obtained from her. She scheduled for operation on 6/5/05. She was advised on light diet for the next two days before operation. She done enema at 6 p.m. the day before the operation and at 6 a.m. the morning of the operation. The morning of the operation, she was premedicated with intramascular atropine 0.6mg and wheeled to theatre. In theatre she was given spinal anaesthesia and placed in exargerated lithotomy position. Vulvo-vaginal toilet was done with chlorhexidine solution and sterile drapes applied. Pelvic examination showed features of an android pelvis. A Sim's speculum was introduced into the vagina over the posterior wall and inspection revealed a defect on the anterior vaginal wall that was oval in shape and about 1cm long with urine leaking through. The fistula was 3cm from the urethra orifice and was 1 cm long and circumferential. The cervix, urethra and the rest of the vagina were normal. It was classified as VVF 2Ba.

Repair of VVF

A Foley's catheter was introduced into the bladder and inflated with 20mls of normal saline. Two Sim's speculum were placed in the vagina and manipulated to expose the fistula. An incision was made about 0.25–0.5cm from the edges of the fistula through the vaginal mucosa and vaginal wall layers about 0.25cm deep thus creating a raw area. The vaginal mucosa was dissected back from the fistula opening for a sufficient distance to mobilise the bladder wall about the fistula. The inner edges of the incision were approximated with vicryl No 3/0 interrupted mattress sutures. The outer edges were also approximated with the same suture. Methylene blue dye was introduced into bladder through the urethral catheter and there was no leakage. A bulbocavenosa graft was done. A gauze pack soaked in iodine solution was left in the vagina. The Foley's catheter was fixed to a urine bag.

Postoperative care

The patient was taken to the recovery ward and observed half hourly. She was then transferred back to the ward. She was on intravenous fluids normal saline alternating with 5% dextrose 500mls 3 hourly. She was allowed to drink fluids freely. An input output chart was maintained. She was given intramuscular Pethidine 100mg 6 hourly for 24 hours. The vaginal pack was removed after 24 hours. She was to remain in bed for the first 24 hours but was allowed to exercise her legs while still in bed.

She was carefully ambulated on the second postop day. She continued to improve in the subsequent days and did not report any leakage of urine. On the third day she developed fever and the urine was noted to be infected. She was started on antibiotics: crystalline penicillin 2 MU 6 hourly and gentamycin 80mg 8 hourly intravenously. She was discharged home on the sixth postoperative day and advised to come for dye test and removal of catheter on the fourteenth postoperative day.

On the fourteenth postoperative day she was done dye test and no leakage of urine was noted. The suture line was well healed. The catheter was removed. She was however noted to be incontinent and was advised on physiotherapy. She was advised to abstain from coitus for four months. She was instructed that should she get pregnant, she was to attend antenatal clinic and was to by delivered by elective Caesarean section. She was to be reviewed in the gynaecology outpatient clinic in one month. She opted to be followed up in Kakuma.

Discussion

The patient presented was a 20-year-old para 1+0 who had VVF and RVF secondary to obstructed labour. These were successfully repaired in two sessions.

Vesico-vaginal fistula (VVF) is an abnormal communication between the bladder and vagina that allows urine to continuously escape through the vaginal. The first successful repair of fistula was done by John Fatio in 1675, however, the work of Marion Sims was the pioneering work that set the stage for modern surgical repair of fistulae (1). The actual incidence of fistula is impossible to calculate but Harrison has suggested an incidence of 95 per 100,000 (2). By far the leading cause of vesicovaginal fistula in Africa is obstetric trauma. Mati (1982) reported that 87.8% of the cases of urinary fistula were labour related in his series (3), while Orwenyo (1984) reported a rate of 90.7% in 166 cases (4). This figure is in contrast to the situation in developed countries in which obstetric trauma is rarely responsible for fistula formation. The patient presented developed fistula after obstructed labour that ended in a Caesarean section and a stillbirth. The other causes of fistula contribute less than 10% of the cases and include cancer of the cervix, surgical procedures such as hysterectomy and pelvic repair operations.

VVF fall into five groups according to aetiological factors: (5)

1. **Obstetric fistulas:** The basic physical factors responsible for obstetric fistula include obstructed labour, accidental injury at the time of Caesarean section, forceps delivery, craniotomy, symphysiotomy, traditional surgical practices including circumcision and gishiri, and complications of criminal abortion.
2. **Surgical fistulas:** A genital fistula may occur following a wide range of surgical procedures within the pelvis. The contribution of surgical fistulas to the total fistula prevalence in developing countries is small. It is often supposed that this complication results from direct injury to the lower urinary tract at the time of operation.
3. **Radiation fistulas:** The obliterative endarteritis associated with ionizing radiation in therapeutic dosage proceeds over many years and may result in a fistula long after the primary malignancy has been treated. Leakage develops at intervals between 1 and 30 years following radiotherapy. The associated devascularization in the adjacent tissues means that ordinary surgical repair has a high likelihood of failure and modified surgical techniques are required.

4. **Malignant fistulas:** Excluding the effects of treatment, malignant disease itself may result in a genital tract fistula, particularly in areas where primary health care and screening programs are absent or ineffective. Carcinoma of the cervix, vagina and rectum are the most common malignancies to present with fistulas.
5. **Miscellaneous** causes of fistulas in the genital tract include infection (lymphogranuloma venereum, schistosomiasis, tuberculosis, actinomycosis, measles, noma vaginae), trauma, (penetrating trauma, coital injury, neglected pessary, or other foreign bodies), and catheter-related injuries.

In the United States 85% of VVF follow surgery, 10% occur after radiotherapy and only 5% result from obstetric causes (2,3). In developing countries, the leading cause of fistula formation is obstetric injury. In Nigeria 83% of VVF resulted from prolonged obstructed labour and only 1% were from surgical injury (6). In KNH Orwenyo found that 92% of patients had obstetric related fistula (4) while Gunaratne and Mati (1982) found that 40-80% of VVF were in primigravida of whom 70% had obstructed labour due to cephalo-pelvic disproportion. This patient was a primigravida and developed fistula following obstructed labour.

During normal labour, the bladder is displaced upwards into the abdomen. The anterior vaginal wall, bladder base and urethra are compressed between the fetal head and the posterior surface of the pubis. In prolonged labour the intervening soft tissues are devitalized by ischaemia, become necrotic and slough off. The sloughing tissues cause VVF, which usually occurs between the second and tenth post-delivery days (1). Obstetric fistulas are thus most commonly located in the bladder neck and upper urethra. The patient presented developed VVF and RVF on the third day after Caesarean section.

Fistula may be located at any point along the anterior vaginal wall and may include a part or all of the bladder base and urethra. They may be single or multiple (1). They are anatomically classified into:

a) Juxta-urethral fistulas. These include the bladder neck and proximal urethra. The internal sphincter is damaged. They are caused by obstructed labour.
b) Mid-vaginal fistulas. The middle part of the urethra is involved. The sphincter and trigone are intact. They can be caused by surgical trauma radiation and obstructed labour.

c) Juxta-cervical (high) fistulas. These open into the anterior fornix or cervical canal. They are usually due to obstructed labour, surgical trauma and radiation.
d) Large or massive fistulas. They can be a combination of the above three. Most of the anterior vaginal wall is absent. In most of them the bladder neck and trigone are absent.
e) Vault fistulas. These follow hysterectomy.

Of the fistulas 34% of the VVF were juxta-cervical, 28% were juxta-urethral, 16.8% were mid-vaginal and 15.3% were circumferential (6). The patient presented had a mid-vaginal fistula. In KNH VVF classification is presented according to the anatomic/ physiologic location and related to the recommended surgical technique and prognosis. This classification offers guidance o the selection of surgical technique, and has consequences for outcome of the repair. However, it can provide only principles as every fistula demands an individualised approach matched to that specific fistula.

I Fistulas not involving the closing mechanism
II Fistulas involving the closing mechanism
  A Without (sub)total involvement of the urethra
    a Without circumfrential defect
    b With a circumfrential defect
  B With (sub)total involvement of the urethra
    a Without circumfrential defect
    b With a circumfrential defect
III Miscellaneous, e.g. ureterovaginal and other exceptional fistulas

Additional classification can be made according to the size of the fistula

Small	<2cm
Medium	2–3 cm
Large	4–5 cm
Extensive	≥6cm

However, there are instances where the fistula may be small but the damage is such that they are classified as extensive. The patient discussed had a fistula classified as small VVF 2Ba.

The diagnosis of VVF is made from history and physical examination. The four cardinal principles of investigation are simple: a) confirm that the discharge is urinary; b) confirm

that leakage is extra-urethral; c) identify site of leakage; and d) identify or exclude multiple or complex fistulous tracks. The hallmark of urinary vaginal fistula as opposed to other forms of incontinence is continuous leakage of urine. With small fistulas urinary leakage is slight and the woman may void a good quantity of urine. However, with large fistulas sufficient urine does not collect in the bladder to permit voiding. On speculum examination, the fistula is often visualized. When the fistula is small and not visualized, various diagnostic tests can be done including introduction of methylene blue dye with vaginally placed tampon, which stains the tampon if there is a VVF. The tampon will not be stained if there is a uretero-vaginal fistula. Intravenous indigo carmine dye demonstrates a uretero-vaginal fistula. An intravenous urogram (IVU) diagnoses ureteric fistula as well as demonstrating dilatation of the calyces or ureter that often occurs in presence of a ureteric fistula. Cystourethroscopy is used to ascertain the size and position of the fistula especially its relation to the ureteral orifices and vesicle sphincter (1,3). In this patient diagnosis was easily made on speculum examination.

In the management of VVF arising due to pressure necrosis, at least three months waiting period should elapse before repair is attempted. This will give time for inflammation to subside, necrotic tissue to slough off, residual sepsis to subside and tissue planes to be re-established. The following principles should be followed: (1,5)

1. Immediate management by catheter drainage: An abnormal communication between viscera will tend to close spontaneously before epithelialization is complete, provided that the natural outflow is unobstructed. Bypassing the urethral sphincter mechanisms by catheterization may encourage early closure, especially in cases where the fistula is small. This should be maintained for 6–8 weeks, since spontaneous closure in both surgical and obstetric cases may occur within this period
2. Palliation and skin care: The vulvar skin is at considerable risk from ammoniacal dermatitis in fistula patients, and liberal use of barrier creams should be encouraged.
3. Nutrition: Because of social ostracism and the effects of prolonged sepsis, patients with obstetric fistulas may also suffer from malnutrition and anaemia. In order to maximize the prospects for postoperative healing, it is essential to optimize the general health of the patient.
4. Physiotherapy: Early involvement of the physiotherapist in preoperative management and rehabilitation of such patients is essential, as obstetric fistulas are commonly associated with lower limb weakness, foot drop and limb contracture.

5. Antimicrobial therapy: Opinions differ on the desirability of prophylactic antibiotics at the time of surgery. Some authorities avoid their use except for the treatment of specific infection; others advocate broad spectrum treatment in all cases.
6. Counselling: Confident but realistic counselling by the surgeon is essential. Of equal importance is the involvement of nursing staff or counsellors who have experience with fistula patients. In addition, support from previously treated patients can be of immense value in maintaining patient morale, especially where a delay prior to definitive treatment is required.

General principles of surgical treatment can be broadly discussed as shown below: (5)

1. Timing of repair: The timing of surgical repair is perhaps the single most contentious aspect of fistula management. Whilst shortening the waiting period is of both social and psychological benefit, one must not compromise surgical success. The benefit of delay is to allow the slough to separate and inflammatory changes to resolve. Most authorities suggest waiting a minimum of 3 months in obstetric cases, 12 months or more in radiation fistulas and for surgical fistulas 10–12 weeks after the inciting event.
2. Route of repair: Arguments continue as to whether the abdominal or vaginal route is most appropriate. However, individualized management based upon anatomical relationships, extent of injury, and co-morbidities should be the determining factor.
3. Interposition grafts: Several techniques have been described to support fistula repair in different sites. The interposed tissue serves to create an additional layer in the repair, to fill dead space, and to bring in new blood supply to the area. The interpositioned grafts have been most commonly used in the repair of radiation fistulas, or used to limit scarring and reduce post-fistula repair stress incontinence in patients with urethral and bladder neck fistulas. The tissues used include: labial fat and bulbo-cavernosus muscle, gracilis muscle, omental pedicle grafts , peritoneal flap grafts, a pedicled flap of vaginal wall and free bladder mucosal grafting.
4. Urinary diversion: The acceptability of permanent urinary diversion is limited, and the need is infrequent.

The route of repair of VVF depends on position and size of the fistula, structures involved, and the degree of fixation of the tissues. It can be transvaginal, transvesical or transperitoneal. Examination under anaesthesia, done preoperatively or at a different

sitting before the operation, assesses the site and size of the fistula, fibrosis of tissues around the fistula and the best route and position for repair. During repair of VVF, adequate exposure must be ensured. Adequate closure of the bladder defect in two layers without tension is essential. Trauma to the tissues is minimized by use of delicate non-tissue-crushing instruments and fine suture material. The possibility of infection is reduced by ensuring minimal tissue injury, obliteration of dead space, complete hemostasis, and complete bladder drainage postoperatively (2,3,5).

After repair of VVF, the urinary bladder must be kept at rest for 14 days. Urinary output must be 4-5 litres every 24 hours. Dye test is done on the fourteenth postoperative day. The patient should be warned to avoid coitus for at least three months after discharge from the hospital, until the repaired site is firmly healed. If she becomes pregnant then elective Caesarean section should be done since vaginal delivery would endanger the repair.

The overall success rate of VVF repair has been found to be 75.6%. Of these 70% were done vaginally and 21% abdominally 7. From studies done at KNH mid-vaginal fistulas had the highest successful repair rate (85.7%) while circumferential and juxta-urethral varieties had the lowest successful repair rate (4). This patient had a mid-vaginal fistula and repair was successful. In those fistulas where all attempts at repair have failed, urinary diversion may be considered. Methods of urinary diversion include transplantation of the ureters into the isolated ileal loop or pelvic colon (1,5).

Complications of VVF repair include haemorrhage, ureteral obstruction, breakdown of repair, vaginal stenosis and urinary incontinence. Complications associated with VVF formation include rectovaginal fistula, ammenorrhoea or oligomenorrhoea which can be associated with psychological, trauma after a difficult delivery or endocrine upsets, vaginal stenosis, perineal excoriation and perinatal mortality. Orwenyo in his study found that RVF complicated 7.4% of VVF with a stillbirth rate of 70% and a perinatal mortality rate of 80% (4). Gunaratine and Mati reported a stillbirth rate of 63.7% and a neonatal mortality rate of 60% (3). The patient presented had stillbirth and ammenorrhoea as complications.

Certainly obstetric fistulas would disappear if early intervention in obstructed labour were available throughout the world and especially in the developing countries. In

addition to the provision of services for fistula management, however, the achievement of the WHO's aims and recommendations is critically dependent on major social changes in areas where fistulas are most prevalent. These changes include government recognition of fistulas as a major public health concern, improvement in the status of women in society, the extension of primary education for girls, deferment of marriage and child-bearing, the abolition of female genital mutilation, improved nutritional status and contraceptive services, and affordable, accessible and acceptable services for all pregnant women. These sociopolitical issues were the main concerns of an international workshop on fistula management and prevention in Abuja.

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