Accessory pathway reciprocating tachycardia

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Abstract:

Patients who have an accessory pathway (AP) of atrioventricular (AV) conduction may develop circus movement tachycardia otherwise known as atrioventricular re-entrant tachycardia (AVRT). Orthodromic AVRT is the most common form. It occurs as a result of antegrade conduction through the normal AV conduction system and retrograde conduction to the atria via the AP. Less commonly, conduction occurs in the opposite direction resulting in antidromic AVRT. Tachycardia may also involve multiple APs which may provide both antegrade and retrograde conduction and may alternate antegradely or retrogradely. Tachycardia may occur in which the AP simply acts as a bystander, and does not participate in the tachycardia mechanism. When atrial fibrillation is conducted to the ventricles via and AP, the resultant ventricular rate may be extremely rapid, placing the patient at risk of developing ventricular fibrillation and cardiac arrest. This paper reviews the anatomical and physiological substrates involved in the pathogenesis of AVRT. The acute and long-term management of patients who suffer from these arrhythmias will then be discussed. The normal AV annulus is composed exclusively of electrically inert fibrous tissue. The AV node and His bundle normally act as the sole route of electrical conduction. Accessory pathways occur at all points along the AV ring, and usually occur as isolated abnormalities, although a proportion of patients have associated congenital abnormalities. This is particularly true of right-sided APs. Most APs exhibit non-decremental conduction properties, and conduct faster than normal AV conduction tissue. In many patients with APs the surface ECG reveals clear evidence of pre-excitation, and a good idea of pathway localization is possible using one or more of several algorithms which have been developed. Patients with latent pre-excitation, intermittent pre-excitation, and patients with concealed APs have not evidence of pre-excitation on a proportion or all of Their surface ECGs. Patients present with a history of paroxysmal palpitations, often with associated symptoms such as chest discomfort Syncope is a rare presenting symptom. Unless bundle branch block is present, patients with orthodromic AVRT exhibit a narrow complex tachycardia on the surface ECG. Patients with pre-excited tachycardia including antidromic AVRT, and other forms of SVT in which the AP conducts to the ventricles as a bystander but does not participate in the tachycardias mechanism, present as broad complex tachycardias on the surface ECG which may be difficult to distinguish from ventricular tachycardia. Adenosine is increasingly used for this purpose since it is highly efficacious and has an extremely short half-life. Adenosine is also very useful in the diagnosis of broad-complex tachycardia, and in unmasking latent pre-excitation during sinus rhythm. Electrophysiology study in these patients is frequently performed at the same time as an attempt at catheter ablation; it aims to diagnose, localize and determine the functional characteristics of an AP, and to characterize the role of the pathway in tachycardia. AVRT can be reliably terminated by effective AV nodal blockade. Drug therapy for the prevention of AVRT is useful for temporary control whilst awaiting more definitive measures and in certain cases as long-term management. No class of drug stands out as 'therapy of choice', and physician preference, pro-arrhythmic effects and associated conditions need to be taken into account such that an individual choice can be made in each patient. The management of patients with AVRT has been revolutionized in recent years with the advent of catheter-based techniques

for their cure. Whilst this method of treatment is highly effective and has low complication rates, pathways in particular locations such as the septal region remain challenging.