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Clinical Image

Multifocal Ectopic Atrial Tachycardia

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Abbreviations

MEAT: Multifocal Ectopic Atrial Tachycardia; CHD: Congenital Heart Disease; ECG: Electrocardiogram; SVT: Supraventricular Tachycardia; TID: Three Times a Day

Clinical Image

Multifocal ectopic atrial tachycardia (MEAT) is a rare tachyarrhythmia of infancy and childhood, accounting for <1% of supraventricular tachycardia in this age group [1]. The electrocardiographic findings of this condition include three or more distinct P-wave morphologies, irregular P-P and R-R intervals, atrial rates up to 400beats/min and ventricular rates at 150 to 250 beats/min [2-4]. It is also known as chaotic atrial arrhythmia and arises from multiple foci of increased automaticity located within the atria [2-4].

Herein, we report a 7-year old boy who had at least two documented MEAT episodes triggered by upper respiratory tract infections and who finally reverted permanently to sinus rhythm requiring no further follow-up. At the first episode the Paediatric Cardiologist recommended treatment with Propranolol 20mg TID orally (Figure 1a). After two Propranolol doses, sinus rhythm was restored with ventricular rate of 110-125 beats/minute accompanied by occasional junctional escape beats (Figure 1b). At the second day of treatment bradycardia (60 beats/minute) and hypotension (60/30 mmHg) were noted and two propranolol doses were skipped. Subsequently, multifocal ectopic atrial tachycardia recurred and Propranolol dose was modified to 15mg TID orally (Figure 1c). Sinus rhythm was restored again after 3 days and the patient was discharged home, whereas the medication was stopped after 5 months. Nine months later, MEAT recurred during the course of another upper respiratory tract infection. The 12-lead ECG was similar to that recorded during the previous episode, echocardiography was normal and the patient remained haemodynamically stable. Oral Propranolol was administered at 20mg TID orally, the patient was followed up on a regular basis at the paediatric Cardiology outpatient clinic with serial ECG, echocardiography and holter monitoring, propranolol was stopped after 6 months and no further recurrences were noted.

MEAT in children is considered to be a relatively benign arrhythmia with good outcome if there is no severe underlying illness [1]. Immaturity of both the lungs and the heart might play a key role

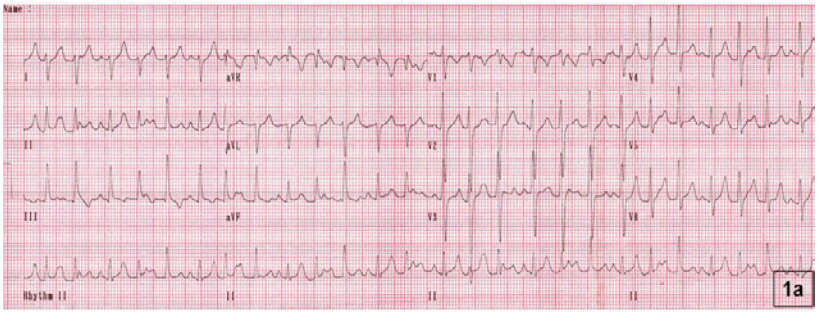

Figure 1a: ECG on admission showing a markedly irregular heart rhythm with multiple (at least three) distinct P-wave morphologies, irregular P-P intervals, isoelectric baseline between P-waves, an atrial rate of 400beats/min and ventricular rate at 160beats/minute.

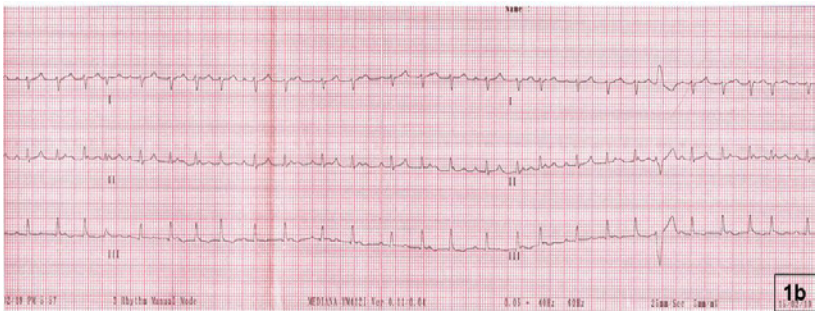

Figure 1b: ECG after two Propranolol doses showing restoration of normal sinus rhythm with a ventricular rate of 110-125beats/minute accompanied by occasional junctional escape beats.

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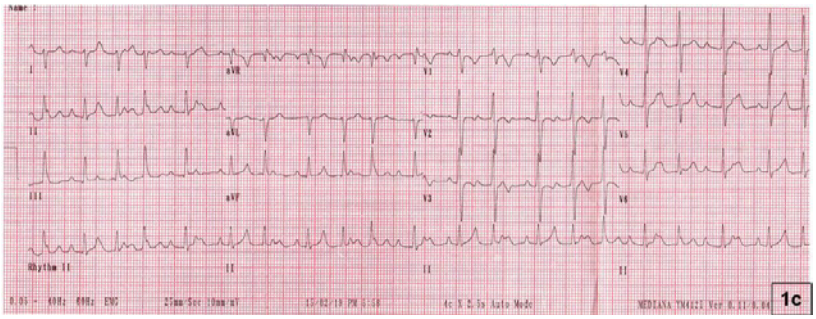

Figure 1c: ECG showing recurrence of multifocal ectopic atrial tachycardia during the course of another upper respiratory tract infection 9 months later.

of infant-predominant age distribution and its favourable outcome in idiopathic infant cases [5]. However, in this age group, if tachycardia persists for several days without medical management, myocardial dysfunction can develop, resulting in congestive heart failure due to tachycardia-induced cardiomyopathy [5]. MEAT is associated with conditions occurring outside of the cardiac conduction system, it is often triggered by respiratory tract infections (>20%) and thus the treatment of the underlying causes is the key to controlling the arrhythmia. MEAT has been reported in the setting of structural heart disease, pulmonary diseases and clinical syndromes (Costello, Noonan or other RASopathy) [6]. Careful ECG rhythm strip interpretation prevents misinterpretation with other types of irregular atrial cardiac rhythms. MEAT is usually a self-limited arrhythmia and although it might represent the predominant rhythm for weeks or months, in most children the irregular, rapid rate alternates with periods of normal sinus rhythm [1]. Response to antiarrhythmic agents is limited and various medications have been used to control the arrhythmia including beta blockers, digoxin, and amiodarone, but there is no data to support the superiority of any one [1,5]. Adenosine and direct current cardioversion have been proven to be ineffective too [1]. It can coexist with atrial premature beats, atrial fibrillation, or atrial flutter or may be an early manifestation of catecholaminergic polymorphic ventricular tachycardia [6]. Therefore, non-infantile MEAT, even in the absence of congenital heart disease might merit aggressive evaluation and close follow-up [6,7].

Conflicts of Interest

The author takes responsibility for all aspects of the reliability and freedom from bias of the data presented and their discussed interpretation.

There are no conflicts of interest including related consultancies, shareholdings and funding grants.

Informed consent has been obtained by the patient's parents for the publication of the case.

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