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Case Report

Perinatal Atrial Flutter: Clinical Presentation, Management and Outcome

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Abstract

Background: Fetal tachyarrhythmias represent uncommon conditions in pregnancy with perinatal atrial flutter accounting for up to one-third of all cases. The detection of a fast heart rate in a fetus or newborn constitutes a médical emergency because it carries a significant risk of hemodynamic compromise, heart failure, neurological morbidity, and perinatal mortality. Results: This report describes a neonate with sustained atrial flutter and poor myocardial function since birth that required multiple external electrical cardioversions and premedication with amiodarone to convert to normal sinus rhythm. Discussion: This case suggests that the management of intractable cases of perinatal atrial flutter is challenging. Long-term prognosis may not always be favorable when the arrhythmia is refractory to therapy and myocardial function cannot be restored timely despite aggressive treatment.

Keywords: Atrial flutter; Synchronized cardioversion; Amiodarone; Adenosine; Neonate; Perinatal tachyarrhythmia

Case

A 27-year-old primigravida underwent a routine obstetric visit at 35+3 weeks and supraventricular tachycardia (heart rate of 250 beats/min) associated with poor fetal movements were noted in the fetus. Upon admission 12-lead ECG had findings suggestive of AF (atrial rate of 460 beats/min and ventricular rate of 230 beats/min) [Figure 1].

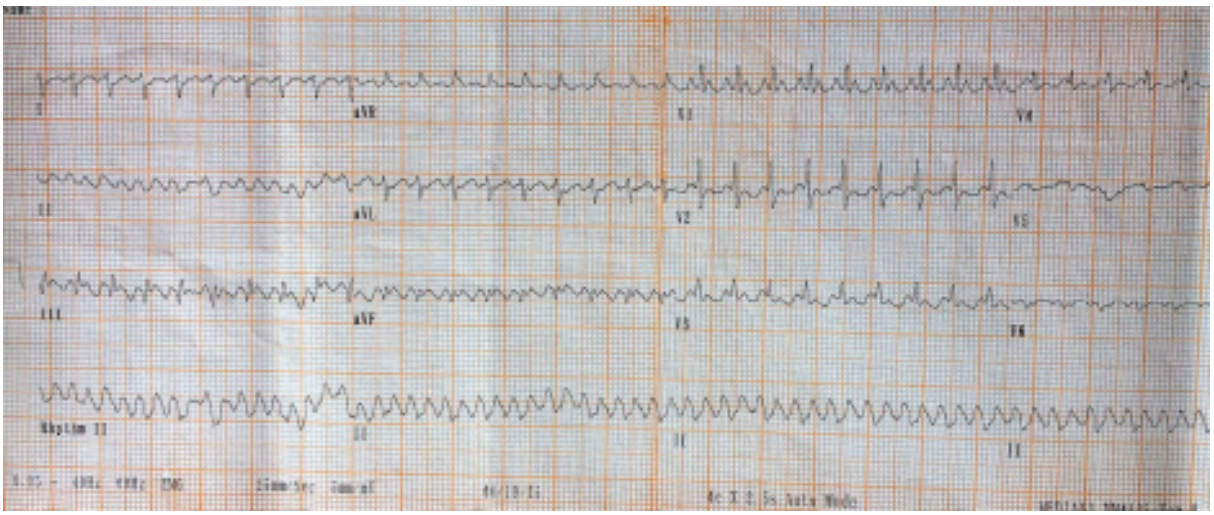

Figure 1: 12-lead ECG on admission showing a ventricular rate of 230 beats/min and saw tooth waves in lead II (atrial rate of 460 beats/min) suggestive of atrial flutter

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Prominent saw-tooth waves (with variable 2:1 to 4:1 AV conduction) were unmasked after adenosine injection [Figure 2A].

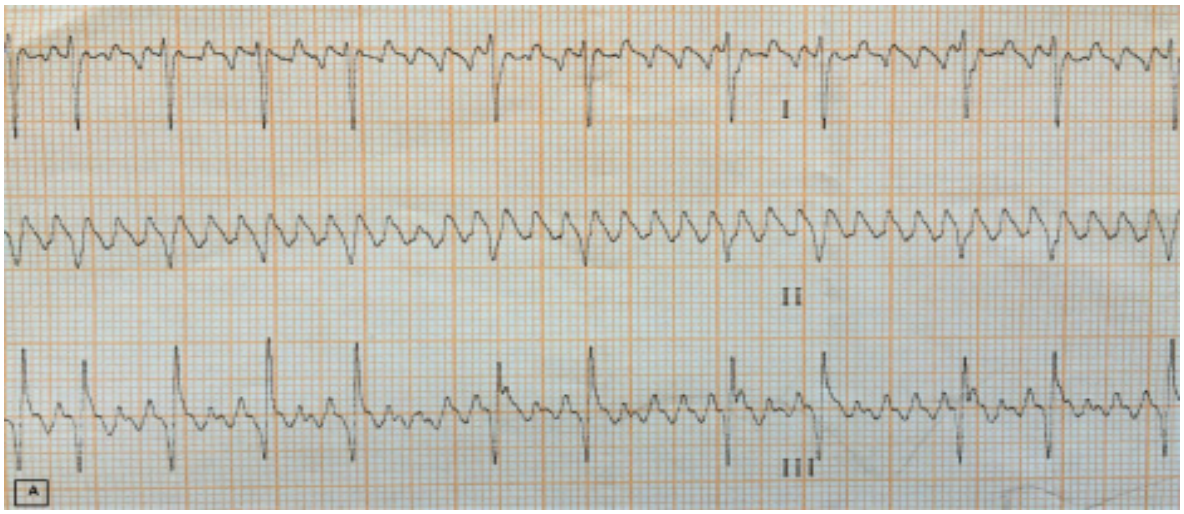

Figure 2A: ECG strip after adenosine challenge test showing prominent saw tooth waves

Several trials of synchronized electric cardioversion were unsuccessful in restoring sinus rhythm [Figure 2B].

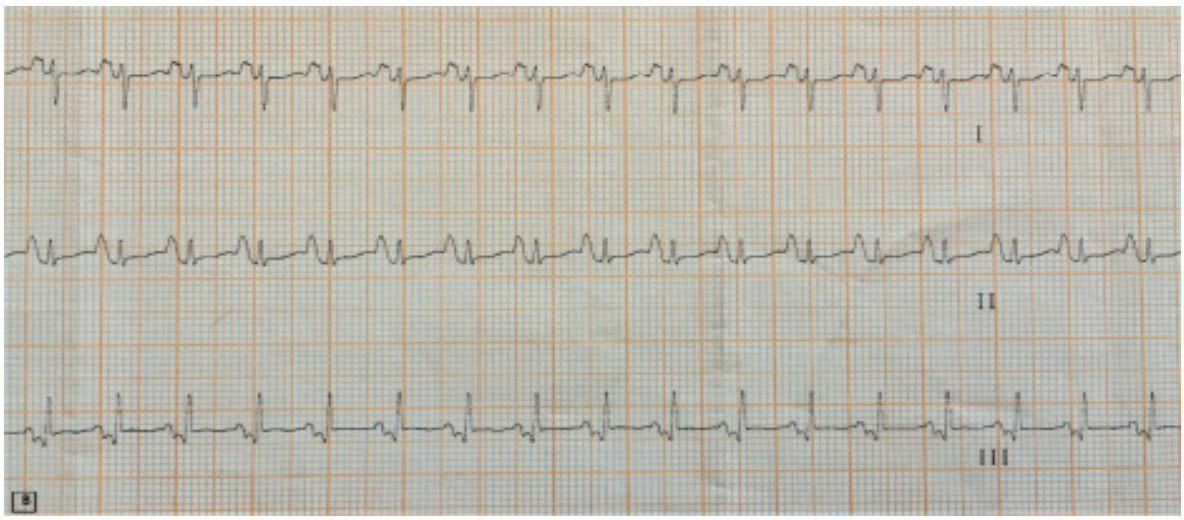

Figure 2B: Figure 2B. ECG strip after premedication with amiodarone and synchronized cardioversion showing restoration of normal sinus rhythm

Transthoracic echocardiography demonstrated severe global left ventricular dysfunction and inotropic support with Dopamine and Dobutamine infusion was given at 20 μg/K/min. Sinus rhythm was achieved after a repeat electric cardioversion (2 Joule/Kg) performed after premedication with Amiodarone (5 mg/kg infusion via an umbilical vein catheter). Tachyarrhythmia in the fetus or neonate (heart rate >180 beats/minute) represents an uncommon condition complicating 0.4% to 0.6% of gestations [1, 2]. Atrial flutter accounts for up to one-third of all perinatal tachyarrhythmias and is sustained by a circular macro reentrant pathway within the atrial wall, whereas the AV node is not part of the reentry circuit. [3, 4, 5].

Atrial flutter is characterized by atrial rates between 300 and 500 beats/minute, usually associated with variable or fixed

AV block and ventricular rates of 150 to 250 beats/minute. Normal or near-normal ventricular rates are observed in AF with 3:1 or 4:1 AV conduction [1, 2, 3]. In the absence of structural heart disease, AF may occur as early as midge station or be identified at birth. 1) ECG demonstrates saw-tooth flutter waves that are best seen in leads II, III, and a VF [1,3,4]. The diagnosis can be unmasked by adenosine which, by blocking AV nodal conduction transiently, reveals more atrial beats per QRS complex [1].

Hydropic infants need to be ventilated with positive airway pressure, a central line should be inserted and an ECG recorded as early as possible [1]. An ECG strip must always be running during adenosine or electric cardioversion. Failure to do so may lead to the misconception that cardioversion failed, whereas the arrhythmia may have stopped transiently and recurred. This is important, because further treatment with antiarrhythmic is mandatory, whereas subsequent cardioversion attempts will be unsuccessful [1]. In refractory cases, intravenous Amiodarone, or transesophageal overdrive pacing, if available, should be administered without delay [1,2]. In cases of failure to restore sinus rhythm, controlling ventricular rate with Amiodarone premedication increases the likelihood of subsequent successful electric cardioversion.

Atrial flutter can be well tolerated if there is a high degree of AV block [1]. However, if AV conduction is brisk (1:1), circulatory compromise or death may occur in about 10% of cases [1, 4, 6]. Delayed diagnosis and long-standing AF may be associated with unfavorable prognosis and adverse neurologic outcomes.

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