First degree atrioventricular block associated with right atrial myxoma

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Summary: First degree atrioventricular block occurred in a 68 year old man with a large right atrial myxoma. This conduction abnormality resolved within three months of successful surgical removal of the tumour. It is suggested that mechanical compression by the myxoma on either the underlying conduction tissue or the interventricular septum is likely to have caused this phenomenon.

Introduction

Right atrial myxomas are uncommon but when present often originate from the interatrial septum. It is surprising therefore that conduction disturbances are rarely noted as an accompanying feature in this condition. This report suggests that large myxomas originating low in the right atrium close to the atrioventricular node can affect electrical conduction.

Case report

A 68 year old man presented with palpitations and dizziness due to atrial flutter (heart rate 150 beats per minute) and required D.C. cardioversion. Once sinus rhythm had been restored, physical examination showed a raised jugular venous pressure with a prominent 'a' wave and a positive Kussmaul's sign, pulse 80 beats per minute and blood pressure 160/90 mmHg. Auscultation of the precordium revealed a third heart sound followed by a low pitched mid-diastolic murmur and a harsh pansystolic murmur loudest at the left sternal edge. All laboratory tests were normal except the following: total bilirubin 36 nmol/l (normal 0–18); alkaline phosphatase 280 U/l (normal 10–110); gamma glutamyl transferase 154 U/l (normal 0–40); lactate dehydrogenase 479 U/l (normal 80–160); IgA 4.7 g/l (normal 0.9–3.5).

The electrocardiogram showed sinus rhythm with first degree atrioventricular (A-V) block (PR interval 224 ms) and peaked P waves in the right precordial leads. The chest radiographs showed mild cardiomegaly. M-mode and cross sectional echocardiography demonstrated a large mobile pedunculated tumour mass in the right atrium,

originating from the interatrial septum and prolapsing into the right ventricle in diastole causing distortion of the interventricular septum (Figure 1).

At operation a large, bilobed myxoma weighing 102 grams was removed from the right atrium. Its base originated close to the septal leaflet of the tricuspid valve.

The patient made an uncomplicated recovery and a repeat electrocardiogram three months post-operatively showed no evidence of first degree block (PR 174 ms) or right atrial hypertrophy. Echocardiography at this stage demonstrated normal interventricular septal motion and no evidence of tumour mass.

Discussion

Twenty per cent of cardiac myxomas are found in the right atrium.^{1–2} The symptoms and physical signs are diverse^{3–5} and echocardiography has proved a sensitive method for their detection⁴ and for excluding a similar tumour in the left atrium.⁶

Various electrocardiography findings have been reported (Table I). Paroxysmal or sustained supra-ventricular arrhythmias occur infrequently and are presumably due to mechanical irritation by the tumour.⁷ Evidence of right atrial hypertrophy is not uncommon but features of right ventricular hypertrophy unusual.^{8,9} Conduction disturbances are rare. Only three previous cases of right atrial myxoma have been shown to have first degree A-V block. Sannerstedt *et al.* reported a P-Q time of 320 ms which was thought to be due in part to digitalis.³ Martin *et al.* described severe damage to the tricuspid valve by a calcified right atrial myxoma,¹⁰ in a patient with tricuspid regurgitation, first degree A-V block and right bundle branch block. Hardin, in his review of primary tumours of

Figure 1 M-mode (above) and cross sectional echocardiogram (below) (apical four chamber view) showing diastolic distortion (arrows) of the interventricular septum (IVS) by the large prolapsing right atrial myxoma (MYX). RV, right ventricle; RA, right atrium; LV, left ventricle, tv, tricuspid valve.

References

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Table I Reported electrocardiographic findings in right atrial myxoma

First degree A-V block ^{10,11}
Right bundle branch block ¹⁰
Right atrial hypertrophy ^{7–9}
Right ventricular hypertrophy ^{8,9}
Right axis deviation ³
Supraventricular extrasystoles ^{3,7}
Atrial flutter (paroxysmal or sustained) ^{3,7}
Atrial fibrillation (paroxysmal or sustained) ^{3,7}
Non-specific ST-T wave abnormalities ³

the heart, also reported first degree A-V block in one of two cases¹¹ of right atrial myxoma. No previous communication has reported the disappearance of this conduction abnormality post-operatively or offered a possible explanation for the phenomenon, however.

The atrioventricular node lies in the lowest part of the right atrium, anterior to the ostium of the coronary sinus and directly behind the attachment of the septal leaflet of the tricuspid valve. In our patient the myxoma arose at this site suggesting possible mechanical effects on the underlying conduction tissue by vigorous movements of this large prolapsing tumour mass. Alternatively, marked pressure indentation/distortion of the interventricular septum by the prolapsing tumour might also be responsible for the slowing in atrioventricular conduction. Such theories would be supported by the disappearance of the conduction disturbance after surgical removal of the tumour.