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Ventricular tachycardia as the presenting feature in two patients with cardiac lipoma and cardiac fibroma

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ABSTRACT

We hereby present two patients with benign cardiac tumours presenting as ventricular tachycardia (VT). Most such tumours have a favorable prognosis, unless complicated by arrhythmias. Intracavitary tumours are easily diagnosed by echocardiography. Intramural tumours as in our patients may be missed at times by echocardiography. Multimodality imaging helped confirm the diagnosis and etiology, since biopsy was not safe. Surgical removal was not feasible due to extensive infiltration. The patients are so far doing well on medical therapy.

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1. Introduction

Primary cardiac tumours are more common in children and more than half of such tumours are diagnosed in infancy [1,2]. Most of them are benign in nature and usually regress over a period of time. But some of them eventually grow and produce obstruction of the cardiac chambers, valves and outflow tracts producing heart failure symptoms. Rarely, they manifest as ventricular arrhythmia, atrial arrhythmia or atrioventricular block.

1.1. Case 1

A 21-year old man presented with hemodynamically unstable monomorphic VT @ 180/min, which was cardioverted. The VT (Fig. 1) showed a QRS of 160 ms with RBBB-like morphology and northwest QRS axis. The sinus rhythm after cardioversion was normal. The echocardiogram showed a disruption of the lateral wall of the left ventricle (LV), possibly because of an infiltrating mass (Fig. 2, Panel A). There was also an area of increased echogenicity in the LV lateral wall (Fig. 2, Panel B). A cardiac CT scan was performed,

which showed a $4.8 \times 7.2 \times 1.4$ cm sized fat density lesion suggestive of cardiac lipoma, in the LV lateral wall, apex and inferior wall (Fig. 2, Panels C, D) with insinuation within the underlying subendocardium and overlying epicardium.

The final diagnosis was VT due to lipomatous invasion. Due to extensive infiltration within the myocardium surgical excision was not feasible. He was advised an implantable defibrillator but refused the same. He was started on amiodarone and metoprolol. Except for one VT recurrence when he had stopped the medicines, he remains asymptomatic at three years of follow up.

1.2. Case 2

A 47-year old man presented with unstable VT at 200 bpm which was DC Cardioverted. The ECG (Fig. 3, Panel A) showed a QRS of 160 ms duration with a RBBB-like morphology and a QRS axis of $+40^\circ$. In the reconstructed CT image (Fig. 3, Panels B), the left anterior descending coronary artery was seen coursing superior to the tumor but no evidence of coronary compression was seen. The cardiac MRI showed a 4.6×3.5 cm homogeneously enhancing mass in the basolateral region which was hypointense on the T2 weighted sequence (Fig. 3, Panels C). The contrast study showed intense homogenous delayed enhancement of the tumor on late gadolinium enhancement sequences, characteristic of fibroma (Fig. 3, Panel D).

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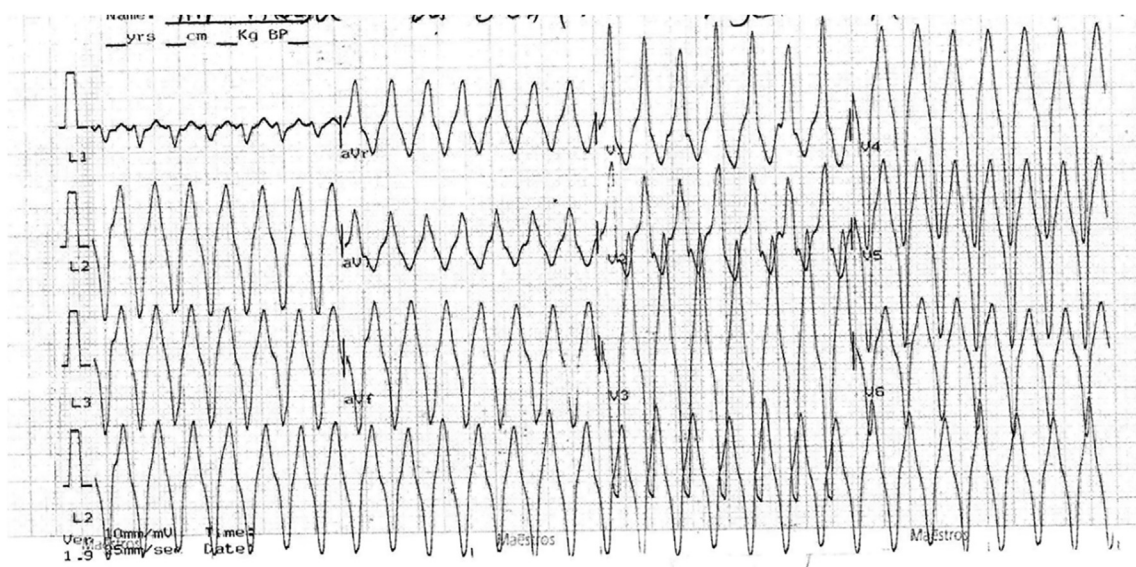


Fig. 1. ECG shows wide QRS tachycardia, RBBB, northwest axis, rate 180/min s/o Ventricular tachycardia.

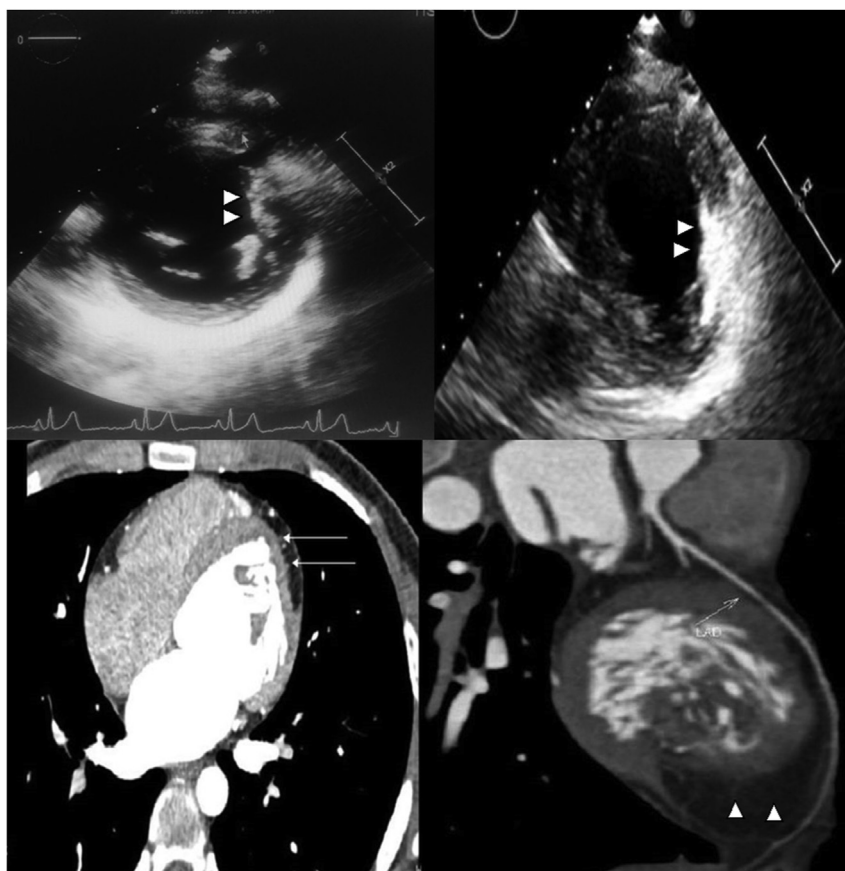


Fig. 2. Panel A: Transthoracic 2D Echocardiogram in parasternal short axis view showing a disruption of the lateral wall of the left ventricle (LV), possibly because of an infiltrating mass (white arrow heads). Panel B: 2D Echocardiogram in parasternal short axis view showing an area of increased echogenicity in the LV lateral wall secondary to intramural tumor (white arrow heads). Panel C and Panel D: Cardiac CT scan in horizontal long axis view showing a 4.8 × 7.2 × 1.4 cm sized fat density lesion suggestive of cardiac lipoma, in the LV lateral wall, apex and inferior wall (white arrows in Panel C and white arrow heads in Panel D).

The final diagnosis was VT due to a large LV intramural fibroma. He was advised an implantable defibrillator but refused the same. On conservative management with amiodarone and metoprolol, there has been no recurrence of VT at five years of follow up.

2. Discussion

Secondary cardiac tumours due to metastasis from systemic malignancies are much more common than primary cardiac

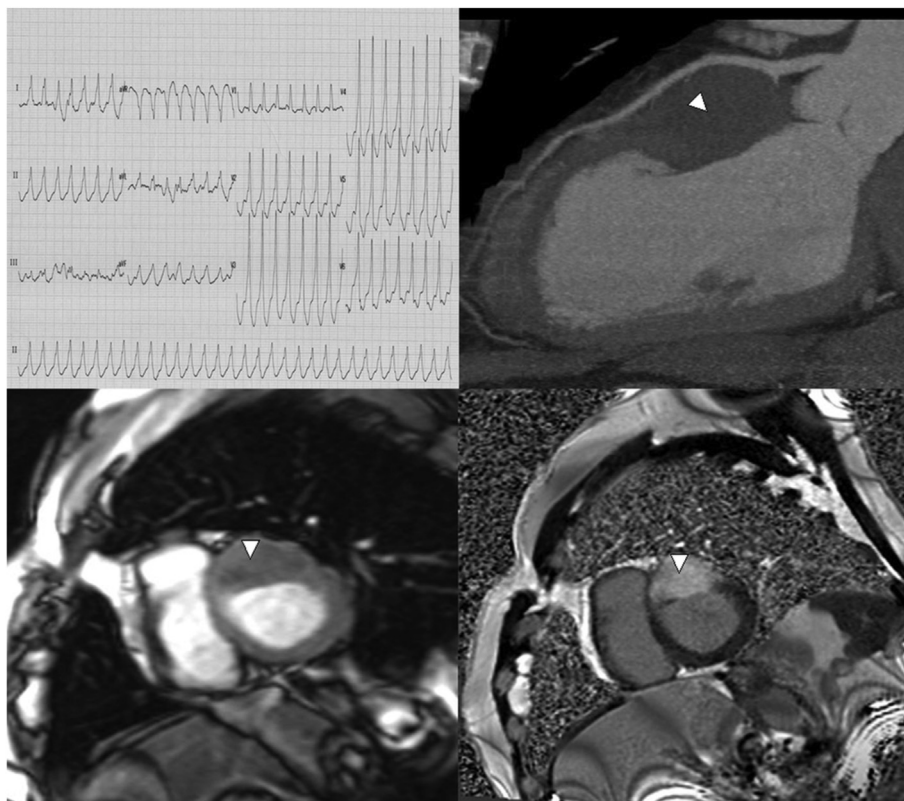


Fig. 3. Panel A: ECG showing VT at 200 bpm and QRS duration of 160 ms duration with a RBBB-like morphology and a QRS axis of $+40^\circ$. Panel B: Reconstructed CT image in vertical long axis view demonstrating the tumor (white arrow head) and left anterior descending coronary artery coursing superior to the tumor without any evidence of coronary compression. Panel C: Cardiac MRI, short axis view, in T2 weighted sequence showing a 4.6×3.5 cm hypointense mass in the basolateral region of LV (white arrow head). Panel D: Cardiac MRI, short axis view, in the contrast films demonstrating a characteristic delayed homogenous contrast enhancement suggestive of LV fibroma (arrow head).

tumours. Majority of the primary cardiac tumours are benign, among which the most common in children is rhabdomyoma, while in adults it is myxoma. The others benign tumours include fibromas, papillary fibroelastoma, lipoma, teratoma, hemangioma and mesothelioma. The presentation can be secondary to mass effect, obstruction, valvulopathy, tachyarrhythmias or conduction disturbances. The mechanism of arrhythmias include: i) differing refractory periods within the tumor mass resulting in asynchronous activation, ii) local re-entry circuit areas where the normal myocardium is interspersed within the infiltrating tumor and iii) compression of His bundle or bundle branches.

Both our patients presented with hemodynamically unstable VT. The first case was lipoma with invasion into subendocardium and epicardium. This accounts for one-tenth of benign cardiac tumours, the mean age of presentation being 50 years [3]. Lipomas are homogenous encapsulated fatty tumours and usually detected on imaging or autopsy due to their benign nature and are rarely infiltrating tumours. They primarily arise from the subendocardium but can also arise from myocardium or subepicardium. Myocardial location is a risk factor for VT or conduction disturbance. Sudden death is a rare manifestation of cardiac lipoma [4,5]. Echocardiographically, a lipoma is usually hyper-echoic. On CT imaging, cardiac lipomas are visualised as homogeneous, low-attenuation masses. On T1 weighted MRI imaging, lipomas show homogeneously increased signal intensity which characteristically reduces in fat-saturated sequences. Our second

case was fibroma in the basolateral LV wall. Fibromas are solitary tumours composed of fibroblasts and connective tissue. While a presentation with arrhythmias is seen in only 10–15% of cases, sudden death is not rare [2,6,7]. They are typically intramural in location, exhibiting slow growth and infiltrating around coronary arteries and conduction tissue, making surgical resection difficult.

Conflicts of interest

No potential conflicts of interest.

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