Surgical Resection of Giant Lipoma of Interventricular Septum Presenting as RVOTO: A Case Report

Manuj Kumar Saikia[1], Jyoti Prasad Kalita[2*], Manish Kapoor[3], Pranjal Phukon,[4] Amit Malviya[5] and Aswin Padmanabhan[6]

[1,2]Department of Cardiothoracic and Vascular Surgery, North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences, Shillong, Meghalaya.

[3,5]Department of Cardiology, North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences, Shillong, Meghalaya.

[4,6]Department of Radiology, North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences, Shillong, Meghalaya.

ABSTRACT

Primary cardiac tumors are rare and lipoma at interventricular septum is rarer. Most of the cardiac tumors are diagnosed incidentally on noninvasive imaging. The clinical manifestations of them depend on its anatomic location. Here we are discussing about a 35-year-old female, who presented with complaints of palpitation, dyspnoea and occasional dizziness for 6 months. On transthoracic echocardiography and Magnetic Resonance imaging (MRI) evaluation, a large mass of 5.4x5.9x6.5 cm in size at interventricular septum was detected. The mass was partially obstructing right ventricular outflow tract (RVOT). As the mass was large, the surgical resection had to be performed via both transtricuspid valve and transpulmonary artery (PA) approach to avoid residual outflow tract obstruction. Aorta was opened to rule out extension of the mass to left of septum. Histology confirmed the diagnosis of lipoma.

Key words: Cardiac neoplasms, Echocardiography, Interventricular septum, Lipoma, Myocardial.

INTRODUCTION

Primary cardiac tumors are rare, with an incidence of 0.2% to 0.4% in narcopsy series.[1,2] Around 75% of primary cardiac tumors are benign.[3] Cardiac lipoma is rare and found in fewer than 1 in 10,000 autopsies. Lipoma generally account for only 0.5-3% of excised heart tumors.[4,5] The higher estimation of lipoma up to 8% among all heart tumors is likely because of inclusion of a separate entity called lipomatous hypertrophy.[2] Cardiac lipoma is circumscribed mass of mature adipocytes. They are true neoplasms and should be differentiated from hypertrophic lipomatosis of the interatrial septum. Cardiac lipoma may occur anywhere in the heart with predilection for pericardium and epicardial surfaces. Rare sites include interventricular septum and cardiac valves.[4] Here, we report a case of surgical near total resection of giant lipoma of interventricular septum which presented clinically with features of right ventricular outflow tract obstruction.

***Corresponding address:**
Dr. Jyoti Prasad Kalita
Assistant professor
Department of Cardiothoracic and Vascular Surgery,
North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences, Shillong, Meghalaya.
E-mail: j.p.kalita17@gmail.com

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CASE REPORT

A 35 years old house wife presented with history of palpitation, progressively worsening exertional dyspnoea grade II to III and occasional dizziness for six months duration. There was no significant past history. None of her family member suffered from similar heart ailment. On examination she was of average built with body weight of 45 kg. There was an ejection systolic murmur

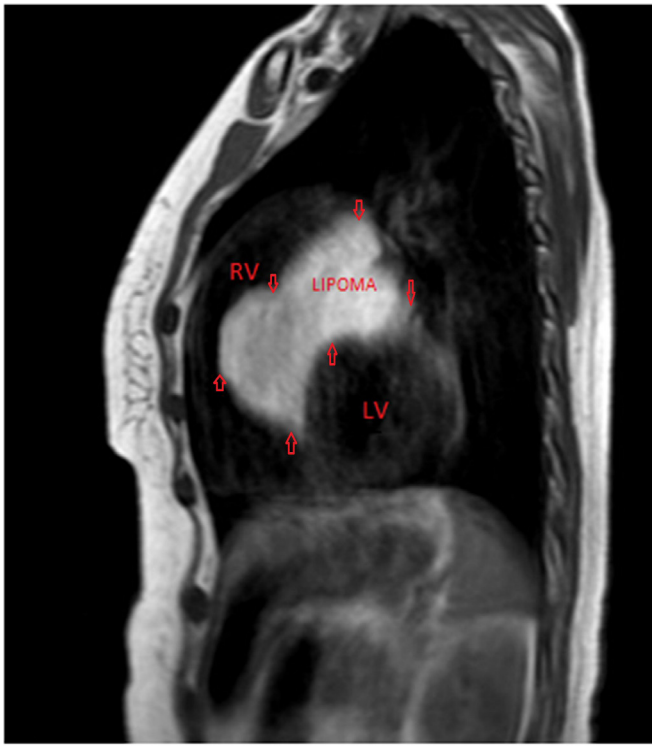

Figure 1: Sagittal T1WI reveals a sharply defined hyperintense lesion (Lipoma, bounded by red arrows) centered at the base of the heart. Caudally the lesion involves the septum between the right (RV) and the left (LV) ventricles and extending to RVOT. The intensity of the lesion can be seen matching with the subcutaneous fat.

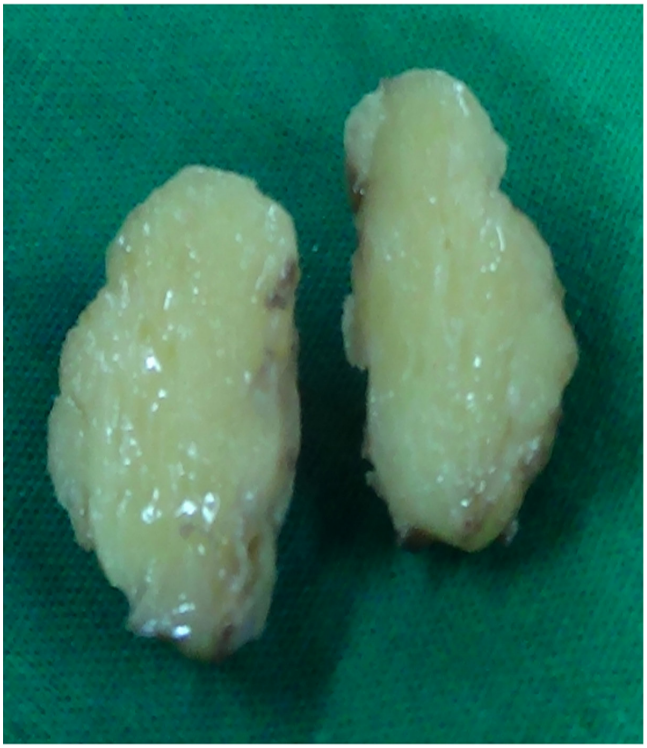

Figure 2: A yellowish mass (slit open) was excised which was embedded in the interventricular septum.

in pulmonary area. The routine blood test was normal including lipid profile. Chest X-ray showed normal sized cardiac silhouette. Electrocardiogram revealed diffuse changes in ventricular repolarization.

Transthoracic echocardiography showed a mass extending from basal interventricular septum till infundibular septal area, measuring 5.1x5.6 cm in size. The mass was partially obstructing RVOT with RVOT peak gradient of 80 mmHg (normal 2 to 5 mmHg). A Magnetic resonance (MR) angiography of the heart confirmed the presence of a large ventricular septal mass surrounded by a fibrous capsule with irregular borders, measuring 5.4x5.9x6.5 cm in its largest diameter. The septal tricuspid leaflet was partially elevated and mass was seen projecting towards right ventricular outflow tract. The tissue characterization of the image suggested that the mass consisted of adipose tissue (Figure 1). The patient was taken up for surgical intervention.

The surgery was performed via median sternotomy and extracorporeal circulation was established with aorto-bicaval canulation, mild hypothermia at 30°C. Myocardial protection was performed with infusion of cold St. Thomas cardioplegic solution through the aortic root and topical hypothermia of the heart. Right atrium was opened and septal tricuspid leaflet was found to be elevated by a large ventricular septal tumor. The mass was partially excised through transtricuspid approach. A yellowish mass (slit opened) embedded in the interventricular septum was found. As the mass was large and extended till infundibular area, the PA was opened longitudinally and near total excision of the mass was done through RVOT (Figure 2). PA was restored with continuous prolene 5-0 sutures. An oblique aortotomy was performed to visualize the septum through left ventricular cavity to rule out extension of the mass towards left ventricular outflow tract. Aortotomy was closed with 5-0 prolene sutures in two layers. RA was restored with continuous prolene 5-0 sutures. After routine deairing, patient came out of cardiopulmonary bypass in normal sinus rhythm. Her post operative period was uneventful and she was discharged after seven days. Pathological examination confirmed the diagnosis of the tumor as lipoma. The patient has been asymptomatic at last follow up after one year.

DISCUSSION

Lipoma of the heart is a very rare tumor. The incidence of ventricular septal lipoma is only 2% among all cardiac tumours.[4] Cardiac lipoma may occur anywhere in the heart.[3] There is a predilection for the pericardium and epicardial surfaces where they may attain enormous size.[1] In our patient, the mass was huge and it extended from the level

of just below the tricuspid annulus till right ventricular outflow tract. When lipoma involves cardiac valve they are designated as fibrolipoma. Lipoma occur at any age and the frequency is equal in both genders.[3] Lipoma occur in children, but account for less than 2% of heart tumors, similar to the relative incidence in adults.

Lipoma grows at a slower rate and can attain a significant size. Cardiac lipomas are usually asymptomatic and found incidentally. Following a long asymptomatic period of about 30-40 years the lipomas begin to proliferate within their capsules and can cause a variety of different clinical symptoms.[6] The clinical manifestations of them depends on the anatomical location and the possible compression or obstruction of cardiac structures. This patient presented clinically in late stage when the right ventricular outflow tract obstruction had already set in. Arrhythmia including atrioventricular block, angina, outflow tract obstruction and syncope are some of the presenting features.[3,5] Our patient presented with palpitation, progressively worsening dyspnea on exertion and occasional dizziness. There was no evidence of stroke or systemic embolus.

Patients with a suspected cardiac mass, the initial diagnostic test are transthoracic echocardiography.[3] The echocardiographic appearance of cardiac lipoma varies with their location. Lipoma in the pericardial space has variable echogenecity but is often hypoechogenic, while intracavitary lipomas are typically echogenic.[3,4] The mass looks circumscribed but it cannot be differentiated from other circumscribed cardiac masses. A multislice CT allows for a characterization of the components within the mass.[5] Low-attenuation features with a density similar to fat on CT are pathognomonic for lipoma. MRI is particularly useful because it allows the characterization of the tissue.[7] It shows cardiac lipomas or lipomatous hypertrophy with characteristic low-signal-intensity margins and high-central-signal intensity on "bright-blood" balanced gradient-echo sequences.[3,5] MRI and CT both allow for very specific identification of fat and therefore can be used to definitively diagnose lipomas.[5,7] The sagittal T1WI view of MRI of our patient revealed a sharply defined hyperintense lesion which had similar intensity with subcutaneous fat.

Lipomatous hypertrophy of the interatrial septum is a separate, non-neoplastic condition, usually found in obese patients, in which the atrial septum is heavily infiltrated with adiposity.[8] This is seen by echocardiography as a very thick and bilobed atrial septum (2–3 cm) with low echo density. If atrial tachyarrhythmia are problematic, weight loss may be beneficial.[4]

The differential diagnosis is quite challenging. Pre-operative diagnosis includes cardiac tumors such as myxomas, lipomatous hypertrophy, fibromas, intracardiac varix.[9] All Cardiac tumours have potency to produce lethal complication like obstruction, embolism and rhythm disturbances. Thus surgery is indicated whenever feasible, even in asymptomatic patients. An interventricular lipoma was first described and successfully removed in the year 1980.[10] Surgical approach depends on tumor size and location. Multiple approaches might be required, depending on the tumor size and location, for maximum removal of tumor as it was done in our case.

The major surgical challenge is excision of the benign lesion from ventricular septum with preservation of an adequate portion of the ventricular myocardium, maintenance of adequate atrioventricular valvular function and preservation of the conduction system. Usually the full excision of the tumor requires ventriculotomy. Video-assisted removal of cardiac tumors, especially those in left side of septum, is a noval technique which avoids a left ventriculotomy, improves surgical visualization and facilitates the completeness of the procedure.[3,11] Whenever feasible excision should be attempted as it carries excellent late prognosis.[5]

CONCLUSION

Lipoma of interventricular septum is rare. Many of these are detected incidentally. Presenting clinical features depends on anatomical location of the tumor. Considering the fact that the lipoma is extremely slow growing tumor and surgical excision carries excellent prognosis even in those patient who present with a bulky tumour, surgical excision or resection should be attempted in all.

ABBREVIATION

RVOT : Right Ventricular Outflow tract
MRI : Megnatic Resonance Imaging
IVS : Interventricular Septum

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