CASE REPORT

Video Assisted Thoracic Surgery (VATS) in Constrictive Pericarditis - An Institutional Experience

Govini Bala Subramanian*, Sonti Sulochana, Jalavadi Manohar*****

Abstract

Constrictive pericarditis is a fibrous thickened pericardial layer which leads to reduced diastolic filling and right heart failure.It is due to inflammation and fibrosis of the pericardium caused by previous cardiac surgery or mediastinal radiotherapy. Once the disease is diagnosed, pericardectomy is the standard treatment There are many techniques and approaches have been described for the procedure, but video assisted thoracic surgery (VATS) procedure is good, done mainly in European countries. In India it was rare to used. So this study focuses on VATS in the management of constrictive pericarditis.

Keywords

VATS, Pericardectomy, MRI

Introduction

Constrictive pericarditis is a fibrous thickened pericardial layer which leads to reduced diastolic filling and right heart failure.It is due to inflammation and fibrosis of the pericardium caused by previous cardiac surgery or mediastinal radiotherapy. Once the disease is diagnosed, pericardectomy is the standard treatment There are many techniques and approaches have been described for the procedure , but video assisted thoracic surgery (VATS) procedure is good, done mainly in European countries. In India it was rare to used. So this study focuses on VATS in the management of constrictive pericarditis.

Case Report

A 48years/ Male, who had recent COVID-19 pneumonia – recovered presented to the emergency department with a history of abdominal distention, pedal edema and worsening breathing difficulties for 15 days, initially consulted elsewhere. His past medical history had no co-morbidities. During the presentation, he had dyspnea at rest with orthopnea. His physical examination showed BP- 120/80 mmhg, PR- 100 bpm, RR- 22/min, and Saturation – 95% on room air. His heart sounds were heard & muffled, RS – NVBS with no added sounds, there were no rubs and JVD.

His initial blood investigations were unremarkable and an echocardiography was performed which showed thickened pericardium with mild pericardial effusion and specks of calcium. Respiratory variation present at the mitral and tricuspid inflow (E – 0.36m/sec : A – 0.48m/sec : E' – 0.11m/sec). Diastolic flow reversal during expiration is seen in the hepatic vein and low normal left ventircular function. A Cardiac MRI was done which showed hypokinesia of the apical segments of the left ventricle, ventricular bounce is seen at the base. Bilateral ventricular chambers appear narrow and tubular with failure to expand during diastole. The pericardium appears diffusely thickened measuring 13.3 mm along the posterior wall of the left ventricle. Late gandolinium enhanced images demonstrate focal areas of enhancement along the anterior and posterior pericardium. Mildly impaired systolic function (EF 31.36%) was present.

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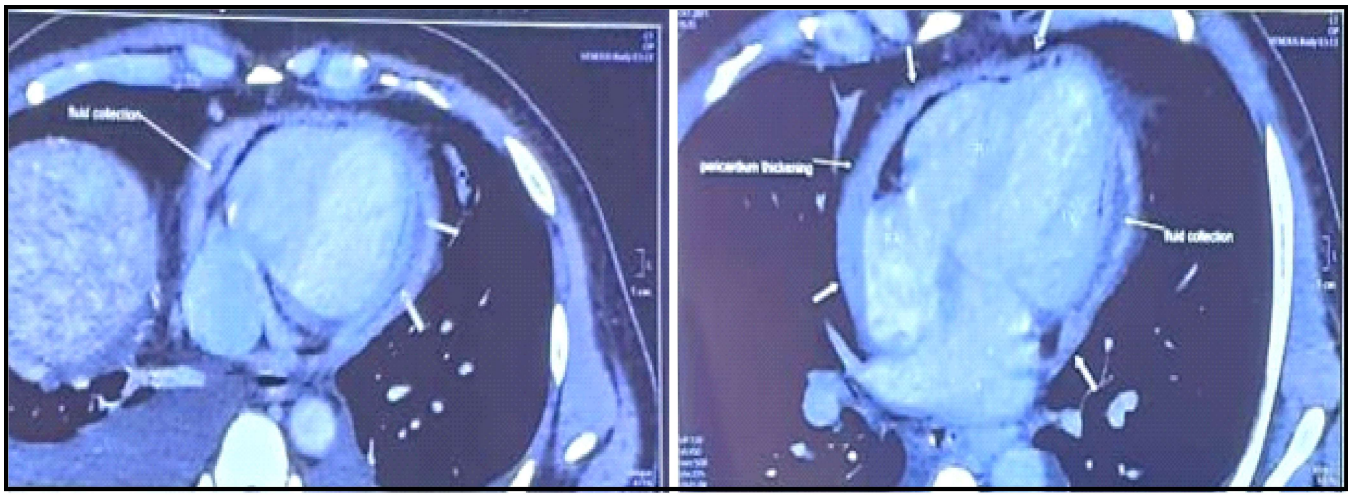

Fig 1a Cardiac MRI Showing thickened Pericardium

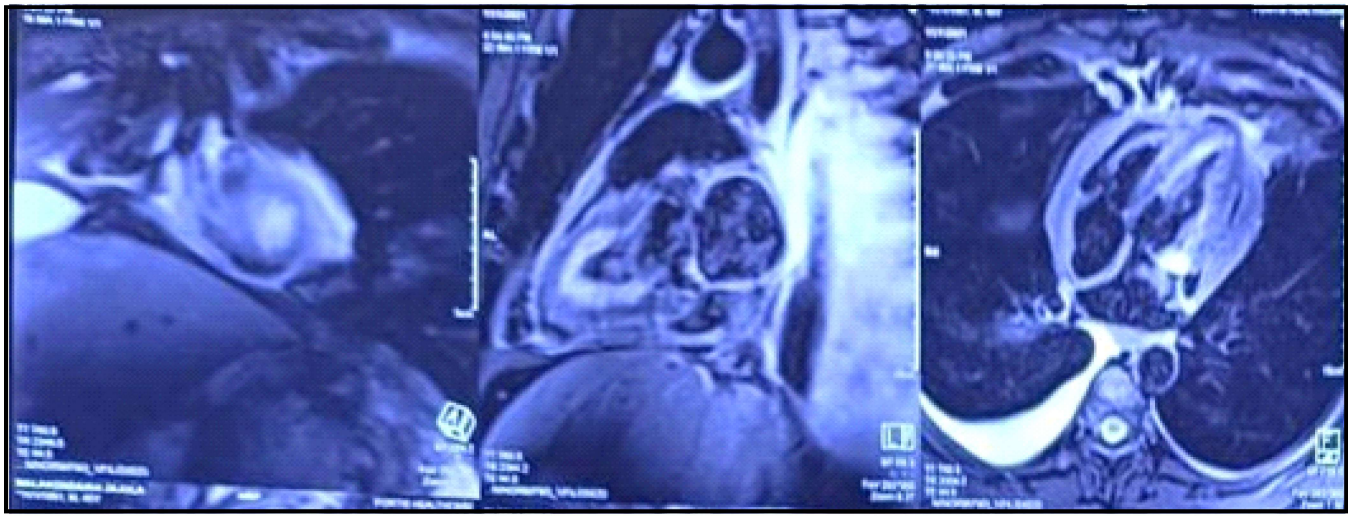

Fig 1b PET -CT Showing thickened Pericardium with Pericardial Effusion

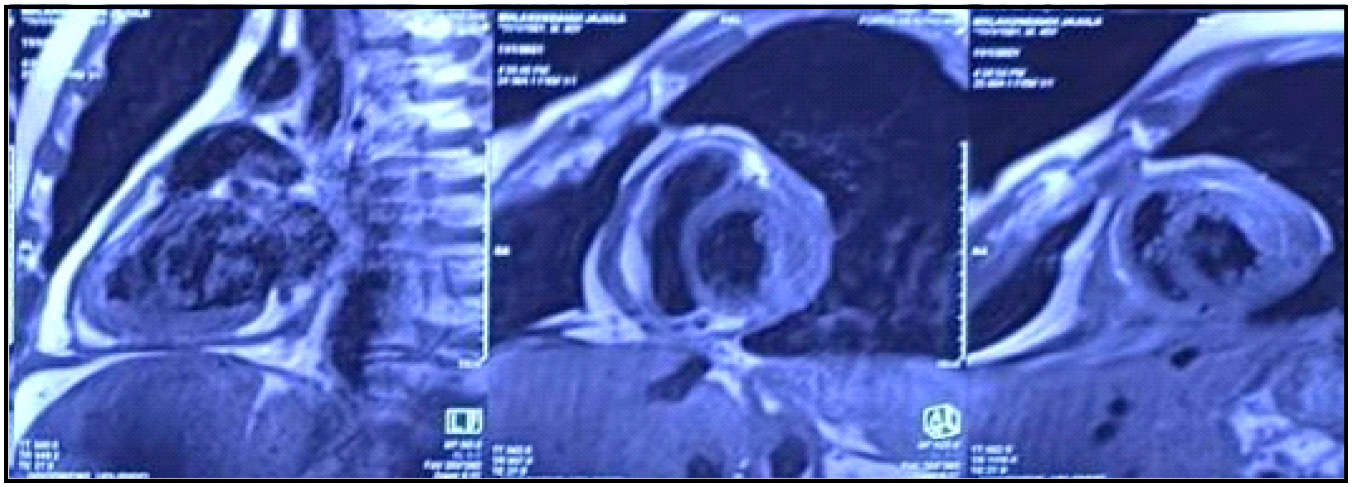

Fig 1c- PET- CT Showing Bilateral Ventricular Chamber Narrow and Tubular

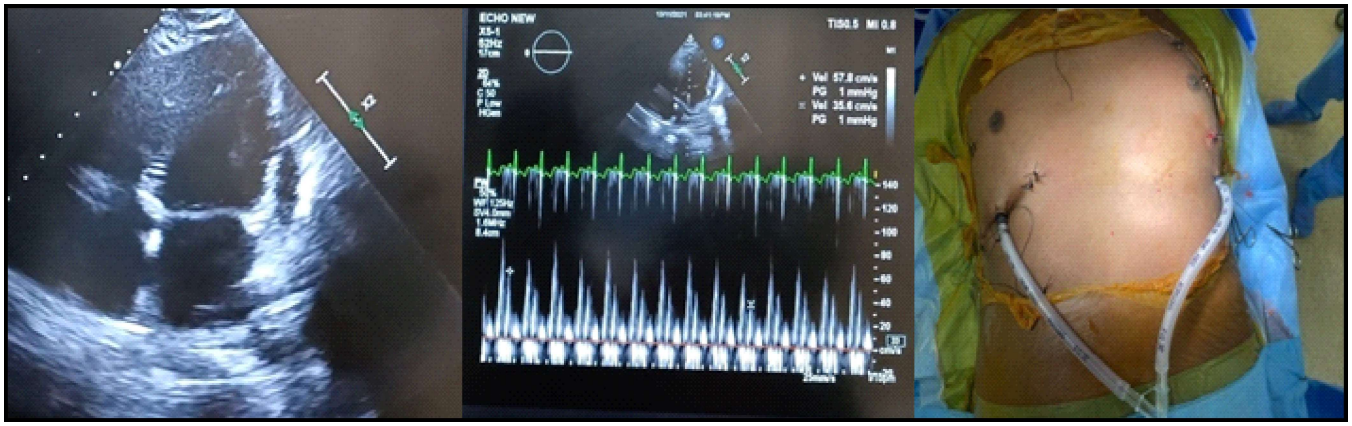

Fig 1d Echocardiography Showing Pericardial & Pleural Effusion with respiratory variation and catheterization of patient

He was evaluated with echocardiography & PET-CT which showed thickenedpericardium withmild pericardial and pleural effusions (Fig1a,b,c,d,e) suggestive of constrictive pericarditis for which he was advised right heart catheterisationfollowed by VATS pericardiectomy. VATS pericardectomy was done under general anesthesia. Pericardium was adherent to all chambers of heart ,superior vena cava(SVC), Inferior vena cava(IVC), Aorta and Pulmonary artery(PA). Thoracoscopically adhesions were relaxed SVC,IVC, Aorta and PA free from adhesions. All chambers were freed. TEF showed good EF.

Discussion

Primary pericarditis is uncommon. It is typically due to viral infection and alsodue to bacteria (MTB), fungi, or parasites that may also be involved. In most cases, pericarditis is secondary to acute MI or cardiac surgery (so-called "Dressler's syndrome"), radiation to the mediastinum, or processes involving otherthoracic structures (e.g., pneumonia or pleuritis). Uremiais the most common systemic disorder associated with pericarditis. Chronic pericarditis may be associated with delicate adhesions or dense, fibrotic scars that obliterate the pericardial space. In severe cases, the heart is so completely encased by dense fibrosis that it cannot expand normally during diastole, known as constrictive pericarditis.

In industrialized countries, idiopathic is the most common cause of constrictive pericarditisin 42-46%[1]**.** Once the diagnosis of constrictive pericarditis is made by cardiac image, a pericardectomy is indicated in symptomatic patients, which is irreversible regardless of its etiology. VATS procedure is done for constrictive pericarditis.

Video-assisted thoracic surgery (VATS) allows a wider resection of the area of the pericardium than the subxiphoid approach without the morbidity of thoracotomy. The cardiac surgeon is able to create a pleuropericadial window. One disadvantage of VATS is that it requires general anesthesia with single lung ventilation, but difficult to do this procedure in seriously ill patients. But in our institute we have done VATS in constrictive pericarditis, which is a rare.

Currently the latest guidelines from Europe on pericardial disease[2] address this cardia MRI, asyet an important machine at a physician's disposal.Some studies revealed that constrictive pericarditis is not an isolated occurrence, even though delay in diagnosis.[3,4,5] Though few studies explained how to diagnose constrictive pericarditis and restrictive cardiomyopathy by ultrasound,[6,7] CTMRI[8],[9] none of them are 100% specific or sensitive . The bestway to assess cardiac filling pressures which can lead to a diagnosis is by demonstrating cardiac pressure waveforms during respiration.[10] Sometimes hemodynamic measurements maynot be adequate to differentiate between constrictive pericarditis and restrictive cardiomyopathy. So histopathological examination of tissue biopsy is necessary for both conditions.

In our case, pericardial stripping of thick adherent pericardium was removed by VATS and sent to HPE.

His histopathology study of pericardium revealed necrotizing granulomatous inflammation with the possibility of tuberculosis withoutmalignancy. (*FIG 2a,2b*) Pericardial biopsy and Pericardial fluid analysis showed positive results of Mycobacterium tuberculosis. He started on anti-tuberculosis regime.

Outcome and Follow-up

His post-operative course was unremarkable and he was discharged from the hospital on postoperative day 5. Subsequent follow-up revealed resolution of the pericardial effusion and improvement in the left ventricular systolic function. His anti-tuberculosis regime continued

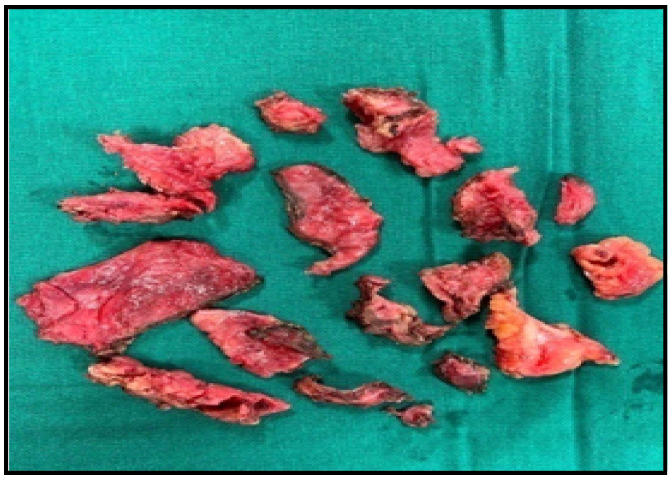

Fig 2a: Gross: Mutiple grey white thickened fibrotic pericardial tissue

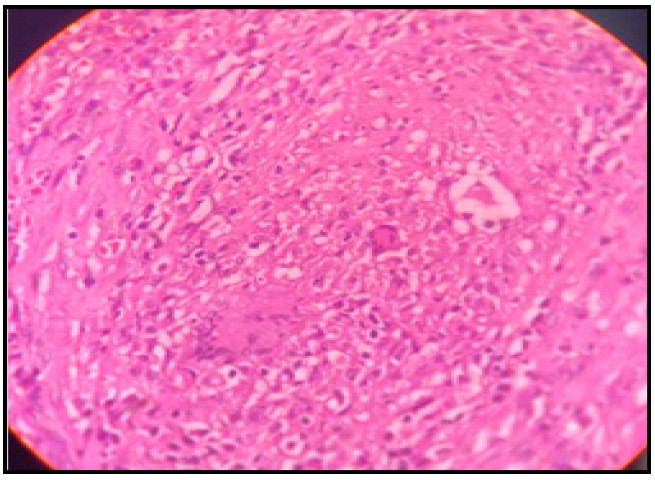

Fig-2b: Epitheliod granulomas with Langhans giant cells with central caseous necrosis, H&E,10X

for 6 months with regular follow-up.

His post-operative MRI showed bilateral ventricular chambers appear mildly narrow. The pericardium is not visualized along the right side and the apex. The visualized residual thickened pericardium with a maximum thickness measuring 12.3 mm is seen along the posterior wall. The systolic function and end systolic volume has significantly improved.

Conclusion

We concluded that VAT is an excellent procedure for constrictive pericarditis to remove adhesions and thickened pericardium. Till now in India no studies are available for utilization of VATS procedure in constrictive pericarditis. In our institute Fortis Hospital done VATS procedure, which is a simple,safe, and effective procedure with low complication rate than open thoracotomy.

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Nil.

Conflicts of Interest

There are no conflicts of interest.

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