

Pericardial Constriction: A Retrospective Study

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SUMMARY

Eightyseven cases of Pericardial constriction were operated in our unit over a period of 9 years from 1977 to 1986. Age ranged from 2 1/2 years to 65 years. Mean age 25 years. 55 were male and 32 were female. In 25 median sternotomy was done and last 62 were operated through Lt. Anterolateral Thoracotomy. Latter approach is now employed as a routine and its advantages are discussed. Mortality in this series was 6.89%. Aetiology as worked out on basis of histopathology and operative findings comes to 44 cases as tuberculous (50.57%) and 43 as non-tuberculous (49.43%).

INTRODUCTION

Pericardial constriction is a disabling condition but having good prognosis if surgery is undertaken in time. Predominant lesion in developing countries is thought to be tuberculous but this concept needs change as tuberculosis is getting controlled. Diagnosis of Pericardial constriction can be made with fair certainty in most of cases. However, at times even invasive investigation like cardiac catheterization may fail to distinguish it from cardiomyopathy and operation may be the only way to ascertain the diagnosis.

MATERIAL AND METHODS

About 2/3 of the cases were referred from Cardiology Unit and the rest from various medical units. Diagnosis was based on history, physical findings, E.C.G. Radiological investigations and Echocardiography, Cardiac catheterization was not done as a routine but only in doubtful cases. As it was our impression that tuberculosis is the dominant cause, cases had antituberculous treatment preoperatively varying from few weeks to few months. Length of anti-tuberculous treatment did not affect the postoperative morbidity or mortality.

In the beginning median - sternotomy was done but later this approach was given up and Lt. Anterolateral thoracotomy through the bed of Vth rib was preferred for its simplicity and other advantage discussed below. Cardiac monitoring, central venous pressure, Blood gases and urinary output were monitored postoperatively. Intra arterial pressure monitoring was not done routinely. Inotropic support was used when indicated. Operative findings of caseous material, tubercles, calcification, effusion was recorded carefully and specimen were sent for histopathology and culture for A.F.B. Cases were followed as far as possible for at least one year as anti-tuberculous treatment was given for that period. Post-operatively *patients require low salt diet diuretics and occasionally Digoxin for 3-6 months.*

PRESENTATION

A total of 87 cases are studied retrospectively from 1977 to 1986, a period of 9 years. Age ranged from 2 1/2 years to 65 years. Mean age 25 years. Male/female ratio was 2 to 1 in patients over 20 years age and approx. equal distribution in those under twenty.

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TABLE-I

	Male	Female	
Age below 20	20	15	= 35 (40.23%)
Age above 20	35	17	= 52 (59.77%)
	55	32	= 87
	(63.22%)	(36.78%)	

The presentation in majority of cases is fairly typical with exertional dyspnoea grade III and IV, Ascites, oedema, raised JVP, pleural effusion (more commonly Rt. sided) but bilateral pleural effusion is quite frequent. Average duration of symptoms was 4 - 5 months. Atrial fibrillation was recorded in approx. 10% of cases. On X-ray of chest cardiac silhouette was enlarged in majority of patients.

Majority of these cases are cachectic with their thin chest walls and bulging ascitic abdomens. The heart sounds are almost of normal intensity with characteristic pericardial knock more often clearly heard in younger patients.

Patients were prepared preoperatively with low salt diet, diuretics, aspiration of pleural effusion, Vit K and Haematinics. They had anti-tuberculous treatment from the time diagnosis was suspected and most of the patients came to surgery with at least 3 weeks anti-tuberculous treatment.

SURGICAL PROCEDURE

All cases except one were done as closed Heart Surgery procedure. The only exception was of a young girl who had large Thrombus in Rt. atrium alongwith Pericardial constriction.

TABLE - II

Median Sternotomy	=	25
Lt. Anterolateral Thoracotomy	=	56
Lat. Anterolateral Thoracotomy with transverse diversion of Sternum	=	6
TOTAL:	=	87

To start with all cases were done using Median Sternotomy approach. It has been now abandoned and Lt. Anterolateral approach is used routinely unless there is a contraindication. In one patient with healed miliary tuberculosis and pericardial constriction Median Sternotomy was used as it was felt that Lt. lung would be stuck and best left alone. Decortication is started from Apex of the Lt. Ventricle and progressed to Rt. side. If there is difficulty of access to Rt. Ventricle, sternum is divided transversely.

Operative findings can be grouped as follows:

- 1- Cases with thick fused parietal and visceral (epicardum) layers which peel off as one layer.
- 2- Thick parietal pericardium is separated from visceral pericardium by caseous material or effusion. Both layers have been excised separately. Decortication of visceral pericardium presents great difficulty especially over Rt. ventricle. There is greater risk of injury to Lt. anterior descending artery.
- 3- A large thick walled cyst commonly over Rt. and infrequently over Lt. ventricle with loosely adherent pericardium over the rest of the Heart. Cyst usually contains thick reddish brown paste.

It is our current practice to excise the pericardium on Lt. side from behind the Phrenic nerve also thus freeing larger extent of Lt. ventricle. On the Rt. side the limit is Rt. sternal edge and this can be done satisfactorily without dividing the sternum in majority of cases. No attempt is made to free the Atria or the venae Cavae. Pulmonary artery is freed to 2-3 cm thus dividing any transverse constricting band.

In long standing cases Lt. lower lobe is found to be atelectatic, Thickened visceral pleura is incised at places and partial decortication done. With the help of anaesthetist blowing down the lung, the Lt. lower lobe is expanded.

TABLE - III

Causes of Death.	Hypoventilation	1
	Injury LAD	1
	Cardiac failure	2
	Respiratory failure	2
TOTAL:		6

Meticulous haemostasis is done and chest is closed with pleural drain.

Mortality in this series is 6 cases (6.89%).

Postoperatively patients are managed with diuretics and inotropic support in the form of Dopamine and Isoprenaline if required. Patients with long-standing constriction usually present much greater problem postoperatively. They remain in Low Cardiac output state for 48 - 72 hours.

Dopamine in doses of 5-10 Mg/Min/Kg body wt. helps these patients greatly. Digoxin is also started and after 48 - 72 hours Dopamine is weaned off. Other postoperative problems include bleeding and respiratory failure.

While working out the aetiology following factors were considered:

Operative findings were given due consideration and if caseous material was present the case was designated as tuberculous even if on histology it was labelled non-tuberculous or non specific. In 34 cases histopathology could not be traced and here operative findings were the only source of information.

Accordingly 44 cases (50.57%) were tuberculous and 43(49.43%) were non-tuberculous.

TABLE - IV

Lesions	Histopathology	Operative finding suggesting tuberculosis	Non-Tuberculosis
Tuberculous	30	30	NIL
Non-specific	9	3	6
Non-tuberculous	15	6	9
Histology not traceable	34	5	28
	87	44	43
	(100%)	(50.57%)	(49.43%)

DISCUSSION

Pericardial constriction is not uncommon and currently we are operating an average of one case/month. It affects young and middle aged alike. Males are more frequently affected. In this series the age ranged from 2 1/2 years to 65 years, mean age 25 years. Diagnosis is not difficult if the condition is kept in mind. Exertional dyspnoea, oedema, Ascites, pleural effusion, characteristic venous pulsation in neck should alert the clinician. On the other hand distant heart sounds, pericardial knock with normal or small cardiac silhouette may not be there. Cardiomyopathy may be indistinguishable and even cardiac catheterization may not be conclusive. Operation may have to be undertaken to rule out the treatable lesion of pericardial constriction².

In 1895 WEIL proposed pericardectomy for thickened fibrous pericardium in constrictive pericarditis⁽¹⁾. In 1916 Rehu & Sauerbruch independently introduced pericardial resection. In 1960 Shumacker and Roshe emphasised Radical pericardectomy to prevent recurrence⁽⁵⁾.

In order to do extensive pericardectomy some surgeons are doing pericardectomy under bypass or with pump ready. We on the other hand have found that satisfactory decortication can be done using Lt. anterolateral approach⁽³⁾.

Following advantages are claimed for a Lt. sided approach over median sternotomy:-

1. It is a simpler approach, there is less blood loss and better healing with minimal scarring. With engorged neck veins median sternotomy can cause troublesome haemorrhage.
2. There is direct access to the Lt. ventricle making it technically easier to go into the correct plane. Lt. ventricle can be freed easily from behind the Lt. Phrenic also.
3. Going from Lt. to Rt. Lt. Anterior descending artery is less likely to be injured from Lt. Thoracotomy than median sternotomy.

4. Lt. Pleura is drained off pleural effusion and gelatinous collections. It may even be possible to partially decorticate the Lt. Lower lobe which in long standing cases is atelectatic. Transverse division of sternum can be easily done if greater access is required to free Lt. ventricle.

How much pericardium should be removed?⁽⁴⁾
The heart in pericardial constriction is like a bird in cage. Open the door of the cage and the bird is free. Is it that simple? should one free only front of both ventricles, or extensive decortication involving Atria, great veins and proximal portions of pulmonary artery. We have found satisfactory relief of symptoms from freeing the ventricles from Lt. Phrenic nerve to Rt. sternal edge. Stripping off proximal portion of pulmonary artery looks after any transverse constriction. Leaving the Diaphragmatic surface stuck provides goods anchoring and prevents over distension of the heart.

Till now we had treated all pericardial constriction cases as tuberculous. The conclusion of this study has led us to start using discretion. It is well recognized that it may be extremely difficult to find histologic clue or positive culture

of AFB. In the absence of stigmata of tuberculosis in the body, negative operative features (caseation, tubercle) negative histology, the patient may be spared the usual one year anti-tuberculous therapy postoperatively.

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