Original Research Article

Clinical profile of patients of chronic constrictive pericarditis

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Abstract

Background: CCP (chronic constrictive pericarditis) is a rare condition that causes diastolic heart failure. The true prevalence is yet unknown. Most of the time, CCP is a major problem because the diagnosis and etiology are difficult to determine in almost all cases.

Aims: To study clinical profile of patients who are undergoing pericardiectomy for chronic constrictive pericarditis.

Materials and methods: This study was a prospective clinical study and contains the study of clinical profiles of all cases which undergo pericardiectomy for chronic constrictive pericarditis. The preoperative clinical profile outcome after surgery was analyzed in 25 cases using standard methods of statistical analysis.

Results: 30 patients were operated for chronic constrictive for a period of 2 years. These patients' age ranged from18 months to 45 years. Male to female ratio was 2:1. Study spectrum consists of 21 Patients (70%) were having chronic constrictive pericarditis and 9 patients (30%) were having effusive constrictive pericarditis. Exertional dyspnea was the most common and present in 93% (28 patients) of cases. Fever and abdominal were present in 66% and 63% of cases, respectively. Peripheral edema and weakness were present in only 1/3rd of cases [9 patients (30%)]. Death Occurred in 4 cases out of 30 cases as they suffered with either low cardiac output, or Renal failure, or RV Dysfunction, or pulmonary edema in the immediate postoperative period.

Conclusion: Pericarditis is a curable disease if diagnosed and treated in the early stages ff pericardiectomy is done early.

Key words

Pericarditis, Pericardiectomy, Exertional dyspnoea.

Introduction

Constrictive pericarditis is a debilitating illness with a promising prognosis if treatment is performed promptly. Pericarditis might manifest as an exuberant condition or a gradual constriction of the heart. Patients have a wide range of symptoms due to a variety of factors. Centers adopting alternative surgical methods, such as the anterolateral thoracotomy and medical sternotomy, have reported good success for both exuberant and constrictive pericarditis. In our country, TB is the most common etiological cause. In most cases, a clinical diagnosis of constrictive pericarditis can be obtained with fair certainty. However, sometimes even invasive tests like cardiac catheterization fail to discriminate between restrictive and non-restrictive cardiomyopathy, and surgery is the only method to determine the etiology [1, 2].

We aim to investigate the clinical characteristics of patients undergoing pericardiectomy for chronic constrictive pericarditis because the condition is not rare and the majority of cases respond well to surgical treatment and have a good postoperative outcome.

Materials and methods

This study was a prospective clinical study and contains the study of clinical profiles of all cases which undergoes pericardiectomy for chronic constrictive pericarditis. The preoperative clinical profile outcome after surgery is analyzed in 30 cases using standard methods of statistical analysis.

Inclusion criteria: All the cases diagnosed as chronic constrictive pericarditis and needs surgical treatment were included in the study.

Exclusion criteria: All acute cases of cardiac tamponade, pericarditis, and constrictive pericarditis that were not operated on due to other factors such as concomitant heart lesions in the heart, tuberculosis cases who have not completed the two months course of ATT(Anti tuberculous treatment).

Patients were prepared pre-operatively with low salt diet, diuretics, aspiration of the ascetic and pleural fluid. Vitamin K was given as a routine.

The approach was through a left anterolateral thoracotomy or a median sternotomy.

Left Anterolateral Thoracotomy Approach [3]
A pillow is placed beneath the left scapula, and the patient is positioned supine. The patient's left hand is tied behind the left buttocks and hangs over the table's well-padded left side. Under the breast anteriorly and more laterally above the fifth interspace, a curved left anterolateral skin incision is performed. The incision is made anteriorly through the pectoralis major muscle, and the fifth intercostal space is opened. The internal mammary veins are usually ligated and divided, and the 5th costal cartilage is divided from the sternum, and the inter space incision is carried well anteriorly. The rib spreader is inserted and the inter space incision laterally and posteriorly extended with scissors as the spreader is gradually opened.

To avoid damage to the left phrenic nerve, it is dissected away from the pericardium with as much fat and soft tissue as feasible. If possible, the pericardium is incised posterolaterally over what is assumed to be the left ventricle, through an area of little calcification.

The initial longitudinal incision is carried anteriorly and posteriorly from its superior and inferior extremities when space is entered. The anterior pericardial flap is dissected and removed for posterior use.

Because failure to relieve pericardial bands over the pulmonary trunk can result in postoperative

gradients and severe right ventricular hypertension, the dissection must be conducted superiorly on to the pulmonary trunk. Except for the area of the central fibrous tendon, which cannot be removed, the pericardium peel at left inferiorly is dissected from the diaphragm.

The fibrous plaques attached to the epicardium are not dissected out over the entire resection area. If the epicardium is thin and normal, it does not need to be disturbed; however, if it has thickened, it must be removed altogether or in a significant number of regions to allow for more normal diastolic filling of two ventricles. Failure to do so will drastically jeopardise the operation's outcome. If there is no pericardial space, the complete longitudinal incision and its anterior and posterior extensions are made solely through the fibrous pericardium, and the incision is then deepened in a region that seems to be over myocardium rather than the interventricular or atrioventricular groove. The posterior flap is slowly and carefully dissected away from the left ventricular myocardium. When the myocardium is dissected or scarred by dancing, an island of calcification and scar may form, which is linked to the myocardium but isolated from other parts. When the process is finished posteriorly, the dissection moves to the anterior pericardial flap, and vice versa.

When the dissection crosses the atrioventricular groove and into the atria, extra caution is required. Because constrictions in the atrioventricular groove might cause gradients between the atrium and the ventricle, it's critical to make sure they're completely gone.

The anterior and posterior pericardial flaps are left lengthy until the dissection is finished so that they can be used to control any myocardial bleeding that arises during the procedure. These pericardial flaps, as well as the diaphragmatic region of the pericardium, are removed after the dissection is finished. A polyvinyl catheter is brought out from the left atrium via the appendage or left pulmonary veins whenever possible to assist in post-operative care.

Two left pleural drainage tubes are placed, the tip of one being placed posteriorly and inferiorly and that of the other anteriorly and superiorly. The inter space incision is closed with continuous Dacron or Vycril. The skin is closed with a continuous subcuticular suture.

Median Sternotomy Approach [4]

The median sternotomy method can be utilised either with or without cardiopulmonary bypass. In either case, the sternum is split in the traditional way. The pericardium is anteriorly and vertically expanded. This operation frequently necessitates the use of a knife, and special caution is exercised when the plane between the thickened pericardium and the myocardium is reached. As previously mentioned, the pericardial flaps are now dissected laterally superiorly and inferiorly. To the right, the dissection passes across the atrioventricular groove and proceeds across the anterior and lateral walls of the right atrium provided the cleavage plane there is readily found, if it is not found, this portion of thickened, pericardium can be left in situ. In the former instance,the pericardial flap is excised 1 cm in front of the left phrenic nerve. The dissection continues posterior to the phrenic nerve, but in the plane between myocardium and epicardium until the entire left ventricular is freed. It is usually then possible to remove the thickened, often calcified outer pericardial layer since there is usually cleavage. The same is usually true of the thickened pericardial tissue inferiorly overlying the diaphragm. When CPB is used it may be convenient to use the femoral vessels for both venous and arterial cannulation. Then after CPB has been established at 37°C, the thickened pericardium can be opened and the dissection accomplished.

Results

Out of the total number of 30 patients, 20 patients were male and 10 patients being the female male to female ratio was 2:1. Patient age in the study group ranged from 1.5 yrs. (18 months) to 45 years with a maximum number of

33% of patients in 2nd and 3rd decade and least of 6.7% in 5th decade. Mean age of the study group was 30 years (**Table – 1**).

Table - 1: Demographic details in study.

Age group (Years)	**No. of Patients**	**%**
0-12 yrs	4	13.3
11-20 yrs	9	30
21-30 yrs	10	33.3
31-40 yrs	5	16.7
41-50 yrs	2	6.7
Etiology		
Tuberculosis	17	56.6
Chronic non -Specific	9	30
Bacterial Pyogenic	2	6.7
SLE	2	6.7
Risk factor		
Smoking	10	30
Nonsmoking	20	70

Figure - 1: Stage of pericarditis.

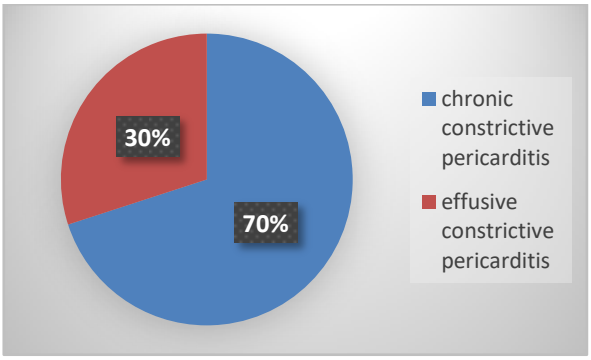

Table - 2: BCG vaccination Status and Mantoux test in present study.

BCG vaccination Status	**No. of patients**	**%**
Vaccinated	22	73
Non vaccinated	8	27
Mantoux test		
Positive	14	47
Negative	16	53

Tuberculosis was the single most common cause [17 patients (56.6%)] for chronic constrictive pericarditis and chronic nonspecific pericarditis was the second most common cause [9 patients (30%)]. Bacteria and SLE are the cause for 2 cases each. Only 10 patients (30%) are found to be smokers and remaining 20 (70%) patients are nonsmokers.

Table - 3: Symptoms and signs in patients in present study.

Symptoms	**No. of patients**	**%**
Exertional Dyspnea	28	93
Fever	20	66.7
Abdominal Distention	19	63
Peripheral Distention	9	30
Chest pain	8	26.7
Weakness	9	30
Orthopnea	3	10
Signs		
Muscle wasting & cachexia	20	66.7
Increased JVP	27	90
Hepatomegaly	25	83
Distant Heart Sounds	26	86.7
Kushal's Sign	27	90
Ascites	22	73
Peripheral Edema	9	30
Pericardial Knock	17	56.7
Pulsus Paradoxus	8	26.7

21 Patients (70%) were having chronic constrictive pericarditis and 9 patients (30%) were having effusive constrictive pericarditis (**Figure – 1**).

22 patients of the study group (73%) were BCG vaccinated and remaining 8 patients (27%) were not BCG vaccinated. 47% of patients (14 patients) were Mantoux positive and remaining 16 were Mantoux negative (**Table – 2**).

Exertional dyspnea was the most common and present in 93% (28 patients) of cases. Fever and abdominal were present in 66% and 63% of cases, respectively. Peripheral oedema and weakness were present in only 1/3rd of cases [9 patients (30%)].

90% of patients (27 patients) had raised JVP and Kushal's sign, 90% of patients were having Hepatomegaly. Ascites and `muscle wasting with cachexia` was present in 73%. Pulsus paradoxus was present in only 26.7% of cases (8 patients) as per **Table - 3**.

X-ray chest PA View revealed cardiomegaly in 22 cases (73% of cases) and calcification of pericardium in 12 cases (40% of cases). In about 23% of cases (7 cases) pleural effusions, straightening of left heart border in 6 cases(20%) and right and left atrial enlargements are seen in 6(20%) and 12(40%) cases (**Table – 4**).

Table - 4: X-ray Chest Finding in present study.

X Ray Chest Finding	No. of cases	%
Pericardial Calcification	12	40
Pleural Effusion	07	23
Empyema	2	6.7
Cardiomegaly	22	73
Straightening of the Lt. Heart Border	6	20
Rt. Atrial, Rt. Ventricular Enlargement	6	20
Lt. Atrial Enlargement	12	40

Table - 5: Complications in present study.

Complications	No. of cases
Bleeding	2
Arrhythmias	1
Delayed Recovery	1
On Ventilation	3

In two cases, significant intra-operative bleeding occurred, and in both of these cases, stiff fibrous tissue was firmly adhered to myocardium, with no distinct cleavage planes between epicardium and fibrous pericardium. Tuberculosis had been identified as an etiological factor in each of these cases (**Table – 5**).

Among the 30 cases in the research group, three required prolonged ventilator support (>24 hours). Because of extensive calcification and dense fibrous tissue leading to obliteration of cleavage planes, successful pericardiectomy was not possible in these three patients, and they were exceedingly unwell with severe ascites, pedal oedema, and muscle wasting with cachexia.

In one example, the right atrium, which had calcified fibrous tissue on it, experienced arrhythmias in the early post-operative period but recovered and were discharged.

In four out of 30 patients, death occurred as a result of low cardiac output, renal failure, RV Dysfunction, or pulmonary edoema in the early postoperative period.

Discussion

Constrictive pericarditis is a reasonably frequent condition, accounting for four out of every 300 cardiac occurrences each year. Young and middle-aged people are also affected. Males are more likely than females to be afflicted. The age ranged from 1.5 years to 45 years in this study, with a mean of 30 years. Patients on anti-tuberculosis treatment for 6 to 8 weeks before pericardial excision and continued for 6 to 9 months postoperatively were kept on anti-tuberculosis treatment once pericardial effusion was diagnosed, and cases suspected of tuberculosis etiology were kept on anti-tuberculosis treatment for 6 to 8 weeks before pericardial excision and continued for 6 to 9 months postoperatively.

The most common cause of pericarditis in this study of 30 patients is tuberculosis, which accounts for 56.6 percent of the study group (17 cases), but it is idiopathic in the UAB series of 27 patients and the surgical experience of GLH from 1960 to 1984, which comprises 52 individuals. Only 15 of the 27 patients in the UAB series, or 55.5 percent, complained of breathlessness on exertion, and 7 of the 24 (i.e., 28 percent) patients complained of chest discomfort for 1-3 months, whereas nearly all of our patients (93 percent) complained of dyspnea on exertion for 1-3 months [5].

The UAB series distribution follows that of McCaughan and colleagues at the Mayo Clinic. According to our findings, pulsus paradoxus is not a common symptom of constrictive pericarditis. Furthermore, in that series, breathlessness and symptoms reported in more than 90% of our patients are uncommon. The most common laboratory symptoms of constrictive pericarditis include low voltage waves on ECG, thicker pericardium on Echo cardiogram, and increased serum bilirubin in all series [6].

In our patients, two techniques have been used, with the anterolateral Thoracotomy being the more common. The left ventricle was released first in all of the patients, and none of them developed pulmonary oedema during or after surgery. Only one patient required inotropic assistance due to a low cardiac output. The operating death rates in the UAB and GLH series were 2 percent -16 percent and 1 percent -9 percent, respectively, but the operative mortality rate in our series is 13.3 percent. The Mantoux test was positive in 14 of the patients. Patients who were given antituberculosis treatment without HPE evidence eventually turned out to have non-specific pericarditis, and their antituberculosis treatment was discontinued. This emphasises the value of pericardial biopsy. Three patients were given anti-tuberculosis treatment for tuberculous pericardial effusion, despite the fact that they developed constrictive symptoms and required pericardiectomy [5, 7].

During surgery conducted by a left anterolateral thoracotomy, fatal bleeding caused by a tear in the right atrium or the vena cava has been recorded, but we did not observe any such difficulties in our investigation. The amount of pericardiectomy is a more controversial topic. After a radical pericardiectomy, as well as after decortication of the anterior surface from the AV groove in the tight to the left phrenic nerve on the diaphragmatic surface, cardiac hemodynamics have been reported to improve. Clifford and colleagues suggested that incomplete decorations are the most common cause of delayed improvement and persistence of pericardial constriction symptoms; however, outcome is related not only to the extent of surgery but also to myocardial involvement, such as myocardial fibrosis and atrophy. CPB was employed in only one case in the UAE series of pericardiectomy studies. However, no patient in our study required cardiopulmonary bypass [8, 9, 10].

Conclusion

If diagnosed and treated early enough, pericarditis is a treatable condition. Pericardiectomy, when performed early, reverses the hemodynamic changes caused by constrictive pericarditis while also establishing the diagnosis of a specific disease, such as tuberculosis, through histopathology. It prevents non-tuberculosis patients from being treated with anti-tuberculosis medications and experiencing their side effects. Last but not least, early pericardiectomy lowers the entire treatment cost.

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