


Original Research Article

# Clinical and surgical outcomes of pericardiectomy done by total anterolateral thoracotomy

Pon. A. Rajarajan<sup>1\*</sup>

<sup>1</sup>Associate Professor, Department of Cardio Thoracic Surgery, Government Mohan Kumaramangalam Medical College Hospital, Salem, Tamil Nadu, India

\*Corresponding author email: [ponrajarajan@gmail.com](mailto:ponrajarajan@gmail.com)

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## Abstract

**Introduction:** Constrictive Pericarditis is a chronic inflammatory process that leads to progressive pericardial fibrosis encasing the heart in a thickened and fibrotic pericardium. This leads to impaired diastolic filling of the cardiac chambers, end result of reduced cardiac output.

**Aim of study:** To analyze the perspectives of clinical outcomes and surgical results of pericardiectomy (total or subtotal) done by left anterolateral thoracotomy.

**Materials and methods:** Totally 20 patients were included in the study. The study was conducted in the department of cardiothoracic surgery, Government Mohan Kumaramangalam Medical College Hospital, From 2013-2017. Regardless of the age group, resection of the diseased pericardium was essential for minimizing early morbidity and mortality and improving long-term functional results and quality of life. This study was designed to compare two types of surgical technique of pericardiectomy, total and subtotal pericardiectomy by left anterolateral thoracotomy.

**Results:** There was a lesser degree of pulmonary complications in both the groups' patients requiring antibiotic therapy and two patients required bronchoscopy for retained secretions and two patients had a pleural effusion, which required drainage.

**Conclusion:** The results of pericardiectomy in terms of improvement in NYHA status and mortality are similar in both types of resection. The combination of chemotherapy and surgery yields good results in the treatment of tuberculosis pericarditis.

## Key words

Cardiac surgical procedures, Pericarditis, Pericardiectomy.

## Introduction

Constrictive Pericarditis is a chronic inflammatory process that leads to progressive pericardial fibrosis encasing the heart in a thickened and fibrotic pericardium [1]. This leads to impaired diastolic filling of the cardiac chambers, with an elevation of right atrial mean pressure and end diastolic pressure in both ventricles with the end result of reduced cardiac output [2]. Overall 5-year survival rates as high as 70 - 80% has been reported after resection with curative intent. As a result, an increasing number of patients are now surviving on a long-term basis. Their quality of life may be very much influenced by the adequacy of pericardial resections [3]. Pericardiectomy has also been performed with or without the use of cardiopulmonary bypass with each having its proponents [4]. Regardless of the surgical approach, resection of the diseased pericardium is essential for minimizing early morbidity and mortality and improving long-term functional results and quality of life [5, 6].

## Materials and methods

Totally 20 patients were included in the study. The study was conducted in the department of cardiothoracic surgery, Government Mohan Kumaramangalam Medical College Hospital, From 2013-2017. Pericardiectomy has been performed without the use of cardiopulmonary bypass. All patients operated were monitored with invasive monitoring like CVP and intra-arterial pressure measurements. Resection of the diseased pericardium is essential for minimizing early morbidity and mortality and improving long-term functional results and quality of life. This study was designed to compare two types of surgical technique of pericardiectomy, total pericardiectomy (Group I) and subtotal pericardiectomy (Group II) by left anterolateral thoracotomy.

## Pericardiectomy procedure

Pericardiectomy was performed through a left Antero-lateral thoracotomy in all cases. One cases the thoracotomy was extended across the sternum for thick adhesions. There were some forces driving our decision-making for improvement of the results of patients undergoing pericardiectomy via left anterolateral thoracotomy (**Figure – 1**).

## Results

Analysis of post-operative inotropic requirement, complications and functional status was as per **Table – 1**. Analysis of the etiology was as per **Table – 2**. Analysis of post-operative NYHA classification was as per **Table – 3**. There was a lesser degree of pulmonary complications in both the groups' patients requiring antibiotic therapy and two patients required bronchoscopy for retained secretions and two patients had a pleural effusion, which required drainage.

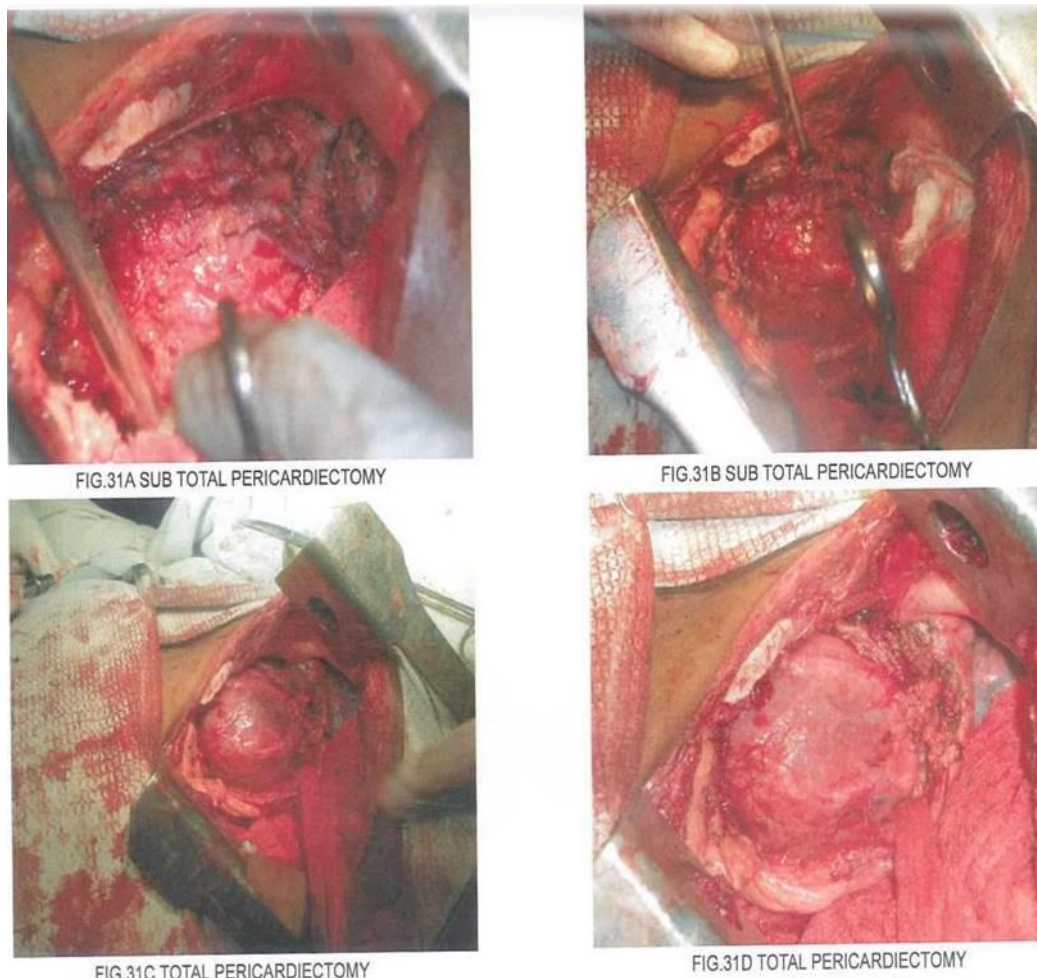
**Table – 1:** Analysis of post-operative inotropic requirement, complications and functional status.

	Group I	Group II
Post-operative inotrope	all	All
Post-operative ventilation	4	3
Wound infection	2	1
Post-operative hospital stay	14.2 days	15.1
NYHA functional class I	12	5
II	8	5
III	nil	Nil
IV	nil	Nil
30-day mortality	nil	nil

**Table – 2:** Analysis of the etiology.

Histopathology		
	Group I	Group II
Tuberculosis	4	3
Non-specific	6	7

**Figure – 1:** Surgical approach in sub-total pericardiectomy (A, B) and total pericardiectomy (C, D).



**Table – 3:** Analysis of post-operative NYHA classification.

	Group I	Group II
Class I	7	4
Class II	3	1

## Discussion

Chronic constrictive pericarditis is an inflammatory process that involves both fibrous and serous layers of the pericardium, leading to pericardial thickening and constriction of the ventricles [7, 8, 9]. Tuberculosis causes a fibrinous suppurative exudate that eventually produces adhesion between the visceral and parietal layers and thickened calcific constrictive pericarditis. Patients who have TBC myocarditis present with heart failure and constrictive pericarditis causes severe heart failure [10, 11, 12]. Constrictive pericarditis typically presents with chronic, insidious signs and symptoms of

predominantly systemic venous congestion [13]. In cases of constrictive pericarditis, CXR, Computed Tomography (CT), magnetic resonance imaging (MRI) reveals thickened pericardium, and cardiac catheterization indicates diastolic equalization of pressures in the 4 chambers. Various diagnostic advances over the years have enabled us to differentiate between these 2 conditions [14, 15]. Pericardiectomy is the only accepted curative treatment for improving cardiac hemodynamics in Tuberculous and non-Tuberculous pericarditis [16, 17, 18]. Left anterolateral thoracotomy offers excellent exposure of the anterolateral and inferior aspects of the left ventricle with minimal manipulation and resection of heart. If necessary the incision can be extended across the sternum and onto the right side of the heart. Bleeding caused by a tear in the right atrium or RV has been encountered but uncommon. However,

there are not many studies suggesting the need for removal of pericardium over the atria and the venae cavae and normalization of cardiac hemodynamics has been reported after decortication of the anterior surface of the ventricles from the atrioventricular groove on the right to the left phrenic nerve and the diaphragmatic surface [19]. However, the outcome is related not only to the extent of the surgery but also to myocardial involvement. Long periods of myocardial compression contribute to remodeling of the ventricles with greater involvement of the myocardium in patients with longer duration of symptoms [20].

### **Conclusion**

The present study revealed the importance of respiratory status in perioperative management. Prolonged ventilation was required in only two patients. A thorough assessment of respiratory status is essential to decide on the optimal surgical strategy. The left thoracotomy approach can be offered to all patients with satisfactory respiratory function in all age groups. Invasive monitoring like CVP and intra-arterial pressure measurements are important in assessing the hemodynamic improvement in the intra-operative period and as well as immediate post-operative period.

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