



CODEN [USA]: IAJPBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES**

SJIF Impact Factor: 7.187

<http://doi.org/10.5281/zenodo.3952196>Available online at: <http://www.iajps.com>

Research Article

**SAFETY AND EFFICACY OF LEFT ANTERIOR
MINITHORACOTOMY FOR CARDIAC TAMPONADE****¹Dr Hasnain Abbas,²Dr Muhammad Saleem,³Dr Nargis Bano**¹ Nishtar Medical University and Hospital, Multan² Azad Jamu and Kashmir Medical College, Muzaffarabad³ Bolan Medical College, Quetta**Article Received:** May 2020**Accepted:** June 2020**Published:** July 2020**Abstract:**

Purpose: Cardiac tamponade is a life-threatening clinical entity that requires immediate treatment. Cardiac tamponade can be caused by both benign and malignant diseases. Various treatments have been described for these cases, ranging from needle-guided pericardiocentesis, balloon techniques, to surgical pericardiectomy. The authors describe their experience in the surgical treatment of cardiac tamponade and a comprehensive review of the literature.

Place and Duration: In the Cardiac Surgery department of Nishtar Hospital Multan for three years duration from January 2017 to January 2020.

Study plan: The study involved 61 patients (37 men and 24 women) with a mean age of 61.80-16.32. All patients were taken to the surgical emergency due to heart manipulation.

Results: Cardiac tamponade was caused by mild disease in 57.40% of patients. In the group of cancer patients, the most common cancers were lung cancer, breast cancer and malignant pleural mesothelioma (17-27, 87%). The mean size of pre-operative pericardial effusion in M-2D echocardiography was 30.15 ± 5.87 mm. Postoperative complications occurred in 11 patients (18%). The reoperation rate was 3.3% (2 patients) due to recurrent cardiac tamponade. 30-day mortality was 3.3%. Overall survival was 29.9 ± 20.1 months. Twenty-nine patients (47.5%) died during the follow-up period. Dividing the population into two groups, group B (mild) and group M (malignant), a statistically significant difference was found ($p < 0.001$ in terms of survival).

Conclusion: In the obtained results, an earlier anterior minithoracotomy should be considered in the surgical treatment of cardiac tamponade in patients with benign diseases and neoplasms.

Key keywords: Cardiac tamponade, Minithoracotomy, Pericardial malignancies, Overall survival

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Please cite this article in press Hasnain Abbas et al, *Safety And Efficacy Of Left Anterior Minithoracotomy For Cardiac Tamponade.*, Indo Am. J. P. Sci, 2020; 07(07).

INTRODUCTION:

Cardiac tamponade is a life-threatening clinical entity that requires immediate treatment. It is characterized by hemodynamic abnormalities resulting from an increase in pericardial pressure due to fluid accumulation (serum, blood, bends, pus), which leads to a reduction in the rate of filling, a decrease in stroke volume and cardiac output. Cardiac tamponade can be caused by pericarditis (idiopathic, viral), iatrogenic trauma (percutaneous procedures, post-CABG), chest trauma, cancer (and beyond the chest), uremia, liver cirrhosis, collagen diseases, vasculitis, lupus erythematosus systemic, tuberculosis, Dressler's syndrome, aortic dissection, oozing ventricular, aortic or ventricular leakage (3). Diagnostic cardiac tamponade triad or Beck's triad is a reduction in blood pressure, increased venous pressure and a calm heart. The clinical symptoms of cardiac tamponade are hypotension, tachycardia, pulse paradox, increased cervical pressure (Kussmaul sign), muffled heart sounds, decreased ECG voltages, and an increase in the silhouette of the heart on a regular chest radiograph. A variety of treatments have been described for these cases, ranging from needle-guided pericardiocentesis, balloon-based techniques, to surgical pericardiectomy to arrest pressure on the heart and prevent re-accumulation. Surgical techniques are usually associated with a lower risk of recurrence, especially in cancer patients. The literature describes minimally invasive (video assisted thoracoscopic pericardial window) and invasive surgical accesses (sub-axillary pericardiectomy, pericardiectomy by middle sternotomy or left anterior minithoracotomy).

METHODS:

This study was held in the Cardiac Surgery department of Nishtar Hospital Multan for three years duration from January 2017 to January 2020. This study involved 61 patients (37 men and 24 women) with an average age of 61.80 ± 16.32 years (Table 1). All patients underwent emergency surgery due to the presence of cardiac tamponade. The diagnosis was clinical (hypotension, tachycardia, dyspnoea, Kussmaul sign, pulsus paradox) and radiographic (M and 2D echocardiography, chest computed tomography (CT) angiography). In our ward, all patients undergo pre-operative chest computed tomography angiography to exclude any damage to the heart muscle or aortic bulb (ventricular puffing or oozing, coronary wounds). In fact, with these changes, cardiac surgeons are entrusted with patient care. All patients underwent routine biochemical and gasometrical tests for complete diagnosis. In an emergency, all patients with pericardial effusion and haemodynamic disorders were quickly referred for surgery, i.e. the pleural-

pericardial window. The surgical technique involves performing a minithoracotomy of the anterior left side 4-6 cm in the fourth intercostal space with the patient in the lateral position of the 45-degree lateral pressure ulcer. The angle allows better exposure of the pericardial sac. After opening the pleural cavity, intrapleural pericardiectomy is performed in front of the left diaphragmatic nerve, allowing gradual and careful dilatation of the pericardial sac. At the end of the pericardial drainage, a 3×3 cm serum is collected. The rationale is to perform a histological analysis of the tissue and pack an effective agent between the pericardium and the left mediastinal pleura. Chest drainage is assumed after the procedure. The mean intervention time was 36 ± 21 minutes. All data are presented as means with standard deviations and their minimum and maximum values. Qualitative variables are presented as absolute (N) and percentage (%). Survival analysis was performed using the Kaplan and Meier method with relative curves. They were compared with the logarithm regression method. P values less than 0.05 were considered statistically significant.

RESULTS:

At admission, the cause of cardiac tamponade was unknown in most patients (33-54, 10%). In two patients, cardiac tamponade was the first sign of an unknown metastatic disease (lung adenocarcinoma and cardiac lymphoma). In other cases, cardiac tamponade was secondary to the presence of a tumor in the chest or outside (one patient with metastatic penile cancer) or chest injury (3-4, 92%). Histologically mild disease caused cardiac tamponade in 57.40% of patients (35 patients), such as refractory pericarditis (26-43, 33%), hydropericardium with decompensated liver cirrhosis or chronic renal failure. In the group of cancer patients, the most common cancers were lung cancer, breast cancer and malignant pleural mesothelioma (17-27, 87%). In addition, mediastinal tumors (thymoma, lymphoma, synovial sarcoma) may cause secondary cardiac tamponade (Table 2). The average size of preoperative pericardial effusion in M-2D echocardiography was 30.15 ± 5.87 mm. However, the amount of pericardial effusion cannot be correlated with the onset of cardiac tamponade; in fact, in our experience, we have seen cases of pronounced pericardial effusion without haemodynamic disturbances due to compensatory mechanisms such as pulmonary hypertension. The average stay of patients in the hospital was 14.5 ± 9.6 days. The reason is comorbidities and postoperative control of patients. In fact, they were all subjected to echocardiography (average thickness of postoperative pericardial effusion: 3.8 ± 5.4 mm) and only in the presence of pericardial effusion

resolution was the thoracic tube removed (average time: 10.4 ± 6.4 days) (Table 1).

Table 1. General population characteristics

Drugs	No.	Percent
Sex		
Male		60.70
Female	37	39.30
Age	61.80	(18-94)
Hospital stay	14.5 ± 9.6	(6-60)
Preoperative fluid collection width	30.15 ± 5.87	(18.00-42.00)
Postoperative fluid collection width	3.8 ± 5.4	(0.00-33.00)
Chest drain permanence	10.4 ± 6.4	(4.00-45-00)
Complications ^a	11	18.00
Re-do surgery	2	3.30
Cumulative OS ^b	29.90 ± 20.10	(0.00-67.00)
Group B	58.4 ± 2.88	
Group M	15.94 ± 2.93	
Death	29	47.5
Disease-related death	22	36.1

Postoperative complications were observed in 18% of patients (11 patients). Most of the cases were related to cardiac complications (atrial fibrillation, ventricular fibrillation, recurrent cardiac tamponade). Two cases of respiratory failure and one anemia were also recorded. In our experience no postoperative hernia secondary to pericardial window surgery was mentioned. The reoperation rate was 3.3% (2 patients) due to recurrent cardiac tamponade. In one case, the second surgical approach was a central sternotomy. Although filling the pleural pericardial window is a surgical emergency, the 30-day mortality was only 3.3% (2 patients). All patients were followed up. Total overall survival in the general population was 29.90 ± 20.10 months. Twenty-nine patients (47.5%) died

during the follow-up period. 22 (75.87%) of deaths experienced the same disease that caused the tamponade episode. Dividing the population into two groups, group B (benign) and group M (malignant), we found a statistically significant difference (P less than 0.001) in terms of survival. In fact, an average of 58.4 ± 2.88 (95% CI: 52.72 to 64.04) months were reported for patients in group B and an average of 15.94 ± 2.93 (95% CI: 33.96 to 47, 96) months, respectively for patients in group M (Figure 1). This discrepancy is mainly due to the etiology of cardiac tamponade. In cancer patients, this hemodynamic manifestation may be the evolution of a metastatic disease with a poor and gloomy prognosis.

Table 2. Cardiac tamponade etiology

	No.	Percent
Etiology		
Benign	35	57.40
Malignant	26	42.60
Disease		
Chronic pericarditis	12	19.70
Pulmonary adenocarcinoma	6	9.80
Pulmonary squamous carcinoma	5	8.20
Breast cancer	3	4.90
Malignant pleural mesothelioma	3	4.90
Hydropericardium	5	8.20
Cardiac lymphoma	1	1.60
Non Hodgkin lymphoma	3	4.90
Penis cancer	1	1.60
Acute pericarditis	14	23.00
Thymoma	3	4.90
Thoracic trauma	3	4.90
Synovial sarcoma	1	1.60
Chylopericardium	1	1.60

DISCUSSION:

Cardiac manipulation is a life-threatening clinical presence that can quickly cause fatal cardiogenic shock. Presentation thereof the heart can range from minimal symptomatic effusion to full cardiac decompensation. In fact, it can be silent (graphic echocardiogram), can present classic symptoms, Beck's Triad (clinical buffer), or it can cause a hemodynamic refractoriness (final buffer). The first two represent the most common conditions and reach more than 90%, as reported by Tsang and his friends. Cardiac manipulation, electromechanical impact and impedance of the body are associated with low electrocardiogram voltages due to changes in impedance abnormalities. These results (low QRS complexes) recover to 81% of cases (Figure 2). Echocardiography is the main diagnostic test for the diagnosis of cardiac manipulation. The M and 2D mode test allows you to assess the thickness of the fusion, indirect symptoms of the heart cyst and hemodynamic dysfunction (Figure 3).

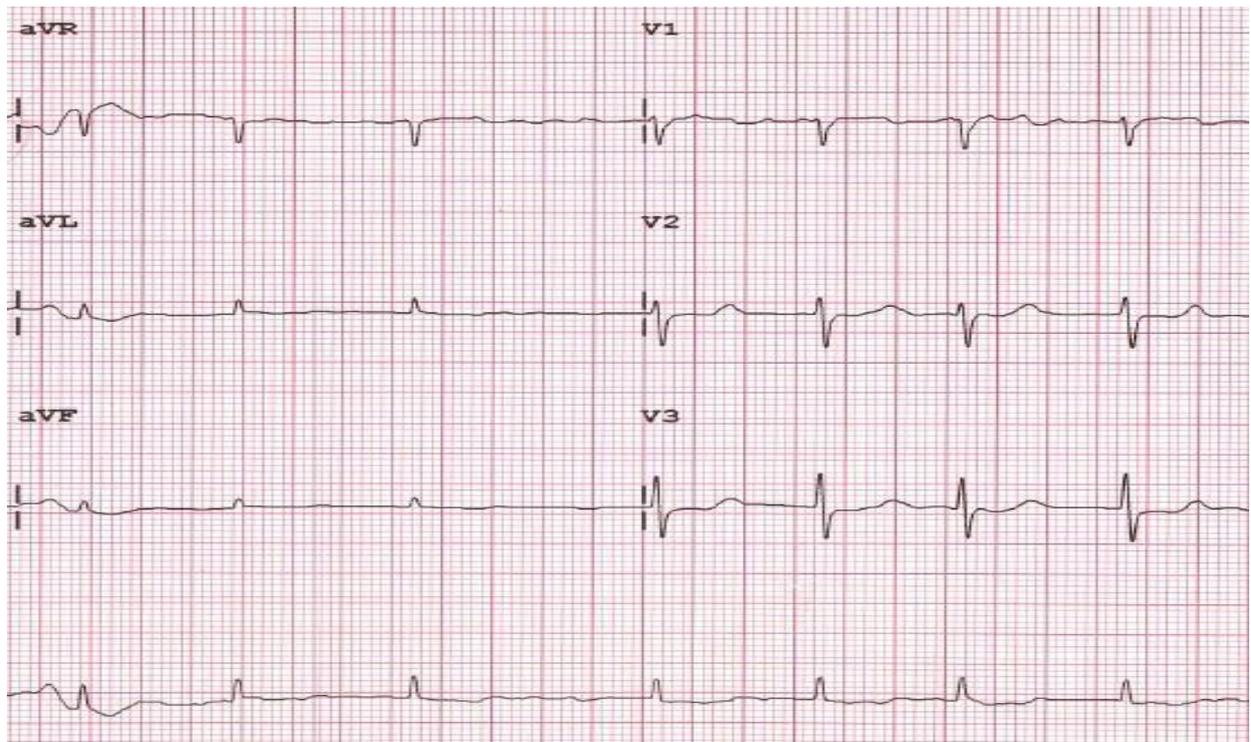


Figure 2. Cardiac tamponade: ECG findings (our personal case).

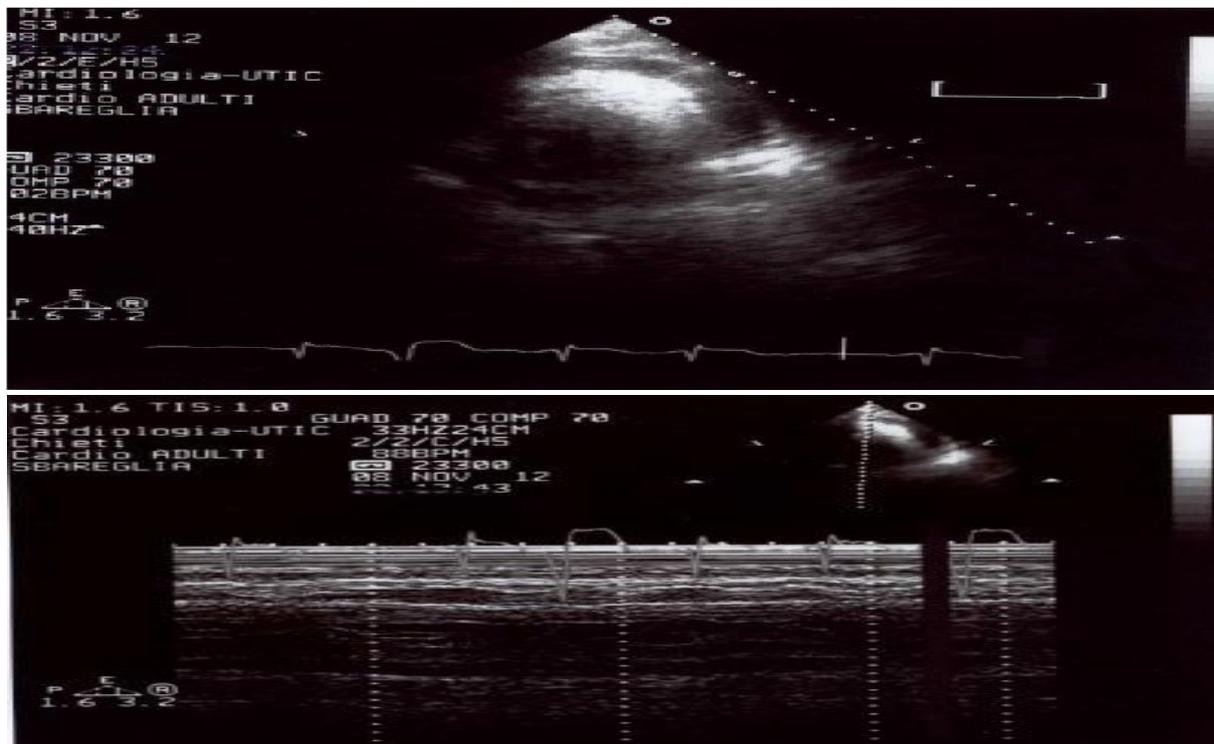


Figure 3. Cardiac tamponade: Echocardiographic findings (our personal case).

Allen and ark, many patients with a heart full of over, reported that more than 60% of cancer cases, the rest of the inflammatory pro-disassembly and the rest of the urea.

In our study, the data seems to be a slight contrast. 57.40% of cases are caused by mild diseases (chronic or acute refractory pericarditis), while the

rest is caused by tumors. These letters included lung cancer (squamous cell carcinoma and adenocarcinoma) predominant (18.0%), followed by malignant pleural mesothelioma, breast cancer and mediastinal tumors.

However, since more than half of the secondary cancers of osikary-um should be used to treat lung

cancer and breast cancer, our results are based on literature. The actual pearl of pericardial and cardiac diseases with metastases lasts from 1% to 18% of all tumors.

Pericardial effusions are less common in cancer patients than pleura; how acute initiation can quickly disrupt clinical conditions and significantly affect prognosis.

The needle carried peristozynosis, considered a treatment station, is a rapid method of drainage. It can be considered in patients with haemodynamically unstable, unrepresented care units or in patients who are not suitable for surgery due to poor clinical conditions. It is well tolerated in all age groups, including children, and can be done quickly in unstable patients to alleviate friendly. In addition, low mortality, low complications, but high rates of relapses.

Parathesis is essential to save lives and is indicated by 20 mm or more (diastolic exfoliation). Most complications of reheating were carried out from the heart or coronary muscle, but with the adoption of echocardiography safety or fluoroscopic conduct.

Maisch et al. These include cardiac perforations (0.9%). Minor uses include pneumothorax, transient blood vessel reaction hypotension, unused supraventricular tachycardia and thoracic fist). Procedural mortality is low (<1%), and overall complications can range between 4% and 20%.

In our study we get an overall mortality rate of 3.3% (character lymphoma and malignant mesothelioma); electromechanical cardiac complications (ventricular fibrillation). The incidence rate in cancer patients was 11.74% (7/11). Cancer patients experienced an average of 10.41-1.79 months, while our study observed a life expectancy in the south between 15.94-3.86. In addition, a low relapse rate (3.3%) significantly lower than those reported in the literature for both osiercesynthesis and surgical. Given these cases, we believe that the source occurs in the rapid formation of postoperative adhesions and therefore leads to the failure of the percar dial window. Both attacks took place within 30 days of the operation, suggesting the beginning of the neighborhood's convergence. This clinical entity is classified as a specific form of iatrogenic or post-traumatic pericarditis and is characterized by recurrent postoperative pericardial effusion. The syndrome usually has self-limiting and variable intenuation between 1% and 17.8%. Nishimura and believe cause the result due to immune factors that interfere with the host's response.

CONCLUSION:

In conclusion, we believe the transthoracic surgical treatment of cardiac tamponade has to be held into account in patients both with benign diseases and malignancies. Our results, in terms of perioperative morbidity and mortality, are quite comparable to patients undergoing minimally invasive or percutaneous procedures. Moreover, low mortality and recurrence rates demonstrate pericardial window via anterior minithoracotomy can be considered a safe and effective method in the treatment of cardiac tamponade.

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