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*Original Research Article*

# Assessment of Outcome of Various Treatment Modalities for Patients with Symptomatic Pericardial Effusion: A Comparative Study

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## ABSTRACT

**Background:** Pericardial effusion is encountered by all the medical specialities. Supervision of these patients is the combined responsibility of cardiologists and the surgeons. In the present study, we compared the outcome and prognosis of the patients with symptomatic pericardial effusions when treated with percutaneous pericardial catheter drainage and with open surgical pericardial drainage.

**Materials & Methods:** The present study included retrospective analysis of the patient's data and medical records of the consecutive cases of symptomatic pericardial effusion that underwent drainage at Rama Medical College Hospital & Research Centre, Hapur, Uttar Pradesh, India. All the patients were divided into two broad groups. Group 1 consisted of 92 patients who were treated with open surgical pericardial drainage and group 2 consisted of 144 patients who were treated with percutaneous pericardial catheter drainage. All the results were analyzed by SPSS software.

**Results:** Retreatment was done in 3.1 percent of the patients in group 1 while among group 2 patients; retreatment was required in 29.2 percent of the individuals. The results were found to be statistically significant.

**Conclusion:** Although both the techniques have their own advantages and disadvantages, in patients with symptomatic pericardial effusion, however, in comparison with pericardiocentesis, a lower recurrence rate was found to be associated with surgical pericardial drainage.

**Key Words:** Pericardial catheter, Pericardial effusion, Surgical.

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## INTRODUCTION

All the medical specialities encounter the patients with pericardial effusion. Supervision of these patients is the combined responsibility of cardiologists and the surgeons. Patients with symptomatic effusions can be severely unwell at presentation, and the immediate aim must be the relief of symptoms, although secondary aims in these patients should include determination of the cause of the effusion and preventing recurrence.[1,2] A wide degree of variation occurs in the clinical presentation of the patients which ranges from gradual onset of symptoms rather than acute tamponade. This often leads to delayed or missed diagnosis due to vague symptoms of fatigue, shortness of breath, or chest heaviness attributed to a gradual deterioration in cardiopulmonary function or ascribed to an advanced disease state.[3] The most common therapeutic mode of treatment for the patients suffering from symptomatic effusions is the percutaneous needle pericardiocentesis. In some patients with asymptomatic pericardial effusions, it is routinely used as a diagnostic procedure. However, pericardiocentesis is itself associated with morbidity and mortality, and there is limited information about the diagnostic role and outcomes of percutaneous pericardial drainage, especially in some groups of patients.[4,5] Hence; we compared the outcome and prognosis of the patients with symptomatic pericardial effusions when treated with percutaneous pericardial catheter drainage and with open surgical pericardial drainage.

## MATERIALS & METHODS

The present study was conducted in the department of general surgery of Rama Medical College Hospital & Research Centre, Hapur, Uttar Pradesh (India) and included retrospective analysis of the patient's data and medical records of the consecutive cases of symptomatic pericardial effusion that underwent drainage. Ethical approval was taken from the institutional ethical committee and consent was obtained after explaining the entire research protocol. Recording of all the demographic, clinical and treatment details of the patients was done at the baseline levels. Data from the clinician team was taken regarding the treatment protocol of the patients who were admitted with chief complaint of symptomatic pericardial effusion and following it, the patients were

divided into two broad groups. Group 1 consisted of 92 patients who were treated with open surgical pericardial drainage and group 2 consisted of 144 patients who were treated with percutaneous pericardial catheter drainage. The groups were categorized based on the primary procedures which were planned for treating the symptomatic pericardial effusion patients. Fulfilling of any one of the following criteria was set for including the condition under urgency of the treatment as documented by the clinical and surgical team, unstability of the patient in relation to hemodynamic parameters, respiratory system compromise state of the patient and procedural complications were associated with the effusion and required urgent treatment.

Subxiphoid pericardiostomy, pericardiotomy via sternotomy, and pericardiotomy via thoracotomy were the techniques used for the surgical drainage. Skilled surgeons performed the surgical drainage procedures. For performing the pericardiocenteses procedures, subxiphoid approach under fluoroscopic guidance was used in the catheterization laboratory. Complete procedure was performed by experienced and skilled surgeons. All the results were analyzed by SPSS software. For the comparison of the baseline characteristic, chi-square test was used. For the comparison of the outcome of treatments in between the two study groups, student t test and one way ANOVA was used. P-value of less than 0.05 was taken as significant.

**Graph 1: Demographic details of the patients**

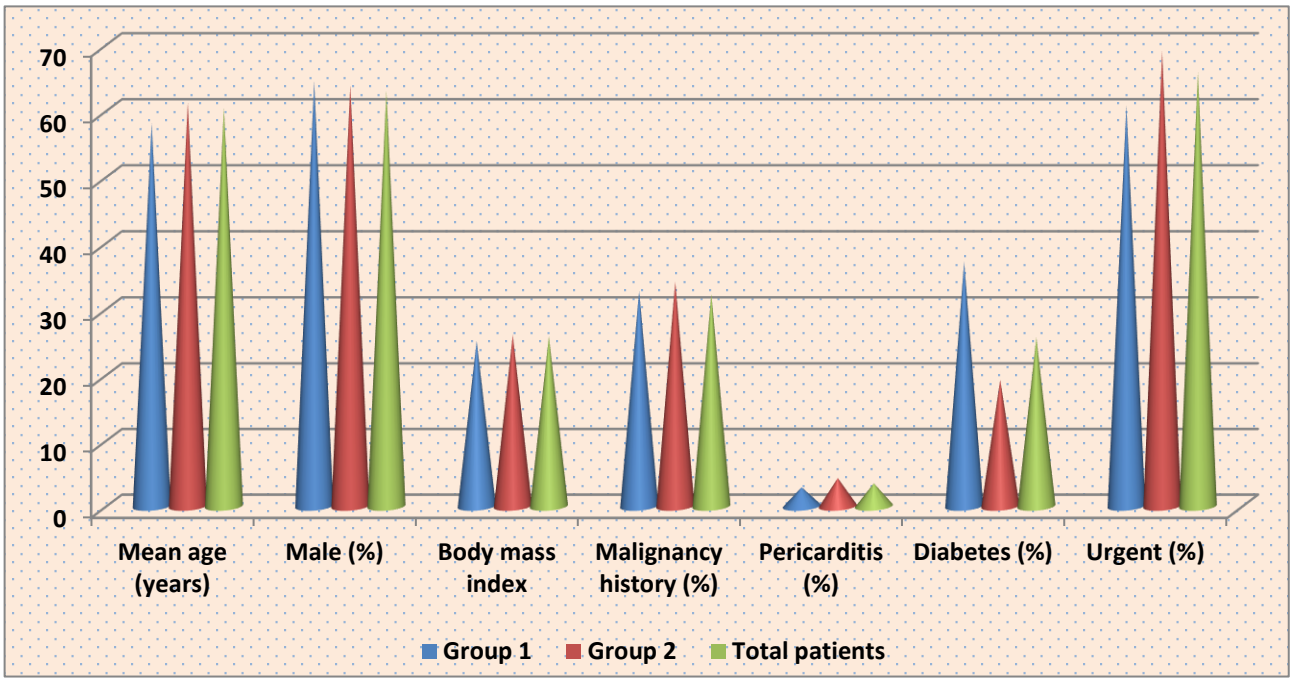


**Table 1: p-value for the demographic details of the patients**

| Parameter | Group 1 | Group 2 | Total patients | p-value |
|---|---|---|---|---|
| **Mean age (years)** | 58.2 | 61.3 | 60.5 | 0.23 |
| **Male (%)** | 64.5 | 63.9 | 63.1 | 0.81 |
| **Body mass index** | 25.2 | 26.1 | 25.9 | 0.46 |
| **Malignancy history (%)** | 32.8 | 34.2 | 32.3 | 0.65 |
| **Pericarditis (%)** | 2.9 | 4.3 | 3.5 | 0.94 |
| **Diabetes (%)** | 37.2 | 19.3 | 25.7 | 0.01* |
| **Urgent (%)** | 60.8 | 69.1 | 65.9 | 0.82 |

*Significant

## RESULTS

Demographic details of the patients are highlighted in Graph 1. Mean age of the patients in group 1 and group 2 were 58.2 and 61.3 years respectively. 64.5 percent of the patients in group 1 were males while in group 2, 63.9 percent of the patients were males. As far as body mass index of the patients was concerned, in group 1 and group 2 patients, it was found to be 25.2 and 26.1 respectively.

Malignancy history was found positive in 32.8 percent of the patients in group 1 while in group 2, 34.2 percent of patients had malignancy history. 37.2 percent of patients were found to be diabetic in group 1 while among group 2 patients, 19.3 percent of the patients were found to be diabetic. No significant results were obtained while comparing the demographic details of the patients. Significant results were obtained while comparing the percentage of diabetic patients in the two study groups. Graph 2 highlights the outcome of the treatment of patients in the two study groups. Retreatment was done in 3.1 percent of the patients in group 1 while among group 2 patients; retreatment was required in 29.2 percent of the individuals. The results were found to be statistically significant (Table 2).

**Graph 2: Outcome of treatment in both the groups**

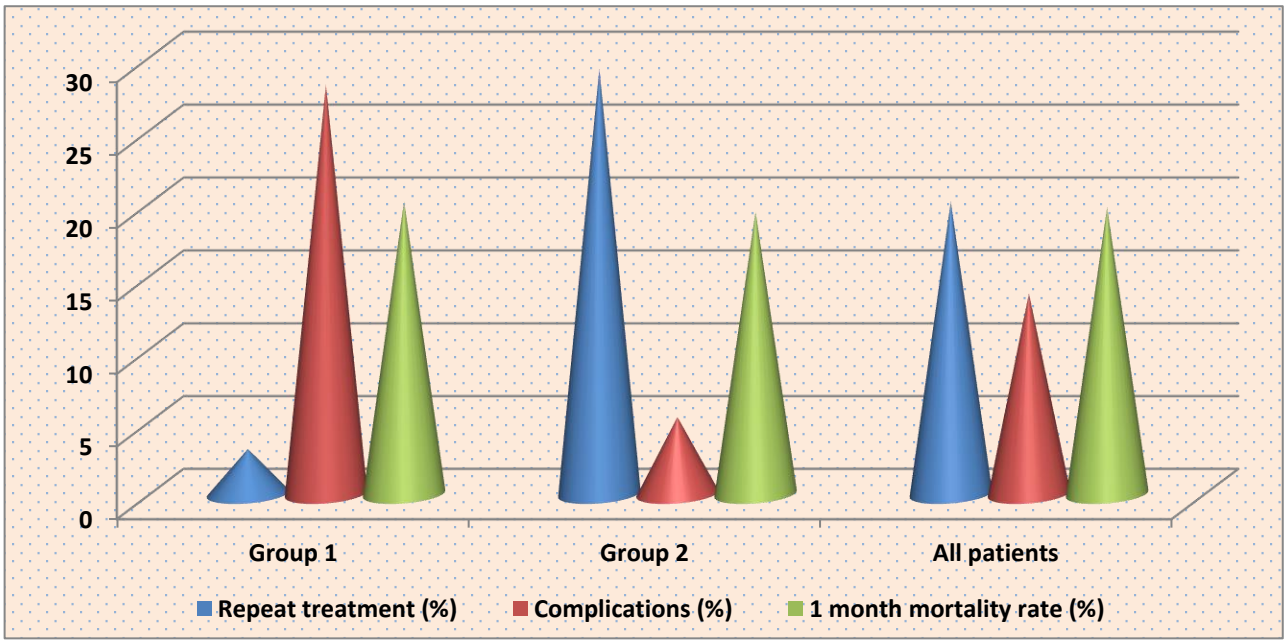


**Table 2: P-value for the outcome of the treatment in both the groups**

| Outcome | Group 1 | Group 2 | All patients | p-value |
|---|---|---|---|---|
| **Repeat treatment (%)** | 3.1 | 29.2 | 20.1 | 0.01* |
| **Complications (%)** | 28.1 | 5.3 | 13.8 | 0.03* |
| **1 month mortality rate (%)** | 20.1 | 19.4 | 19.7 | 0.31 |

*Significant

## DISCUSSION

Cardiac temponage, shock and even death are reported to occur in patients who get affected by pericardial effusion. It is a very potential serious condition characterized by fluid accumulation in the pericardial space.[6] It is still a topic of long standing controversy regarding the exact effective treatment therapy for it. For draining pericardial fluid, both surgical-based approaches and percutaneous-based approaches are available. First description of surgical subxiphoid approach in the literature was done in 1829.[1] Percutaneous pericardiocentesis series was first described by Kopecky SL and colleagues in 1986. Both of these methods have their own advantages and disadvantages.[7] Hence, we compared the outcome and prognosis of the patients with symptomatic pericardial effusions when treated with percutaneous pericardial catheter drainage and with open surgical pericardial drainage.

However, fluctuating results are observed in the literature regarding this. While on one side, some studies quote high association between the two parameters while some other shows lower association.[8-10] Likely relation of the underlying condition that creates effusion and mortality associated with pericardial effusion exists. In the present study, in comparison with pericardiocentesis, a lower recurrence rate of was found to be associated with surgical pericardial drainage. In relation to pericardiocentesis, the overall recurrence rate of approximately 32 percent was observed which is in correlation with the results of previous studies.[9] Recent surgeries in the cardio-pulmonary region were the most common reasons found to be responsible for the cases of pericardial effusion requiring drainage. Saltzman AJ et al[10] investigated the different treatment modalities of pericardial effusion and their outcomes. They retrospectively analyzed patients with symptomatic pericardial and observed that in comparison to the patient that were treated with pericardiocentesis, patients treated with open surgical drainage were found to be associated with a higher frequency of occurring of complications. McDonald JM et al[11] compared the prognosis of the patients having symptomatic pericardial effusions undergoing treatment by percutaneous catheter drainage and operative subxiphoid pericardial drainage and concluded that in patients with symptomatic pericardial effusions, safe performance of Subxiphoid and percutaneous pericardial drainage can be done. However, underlying diseases can results in death. El Haddad D et al[12] assessed the prognosis of percutaneous pericardiocentesis for pericardial effusion (PE) in patients suffering from cancer and they observed that for the primary treatment of PE in cancer patients, including in those with thrombocytopenia, percutaneous pericardiocentesis with extended catheter drainage was safer and effective. Caspari G et al[13] summarized the data on contrast medium echocardiography-assisted pericardial drainage and they stressed that high mortality rate and morbidity is significantly associated with surgical pericardiotomy. Tsang TS et al[14] evaluated the various treatment strategies for primary and secondary management of malignancy-related pericardial effusions and concluded that for both the primary and secondary management of pericardial effusion in patients with malignancies, echocardiographically guided pericardiocentesis with extended catheter drainage appears to be safe and effective procedure. Apodaca-Cruz A et al[15] retrospectively analyzed patient's records that were affected with malignant disease and symptomatic pericardial effusion initially

treated with pericardiocentesis and reported that recurrence rate after pericardiocentesis was 33% and concluded that pericardial window can be considered as a secondary strategy for recurrence, with high effectiveness of the primary management of pericardial effusion with pericardiocentesis in oncologic patients.

## CONCLUSION

From the above results, the authors concluded that although both the techniques have their own advantages and disadvantages, in patients with symptomatic pericardial effusion, however, in comparison with pericardiocentesis, a lower recurrence rate was found to be associated with surgical pericardial drainage.

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