

A Simple Modified Technique of Pleuropericardial Window: Towards 0% Recurrence



Hanan M. Hemead¹, MRCS; Amr Saleh¹, Master Degree of General Surgery; Wael Hassanein¹, MD

¹Cardiothoracic Surgery Department, Faculty of Medicine, Alexandria, Egypt.

This study was carried out at the Cardiothoracic Surgery Department, Faculty of Medicine, Alexandria, Egypt.

ABSTRACT

Recurrent pericardial effusion is commonly encountered in neoplastic and infective disorders. Intervention is compulsory in patients with unstable hemodynamics and tamponading effusion. Surgical options include: pericardiocentesis, subxiphoid pericardiostomy, and pericardial window. The latter has proved to have lower incidence of recurrence; however, the technique has been continuously refined to improve the recurrence-free survival and decrease postoperative morbidity. We

herein present a novel simple modification to minimize recurrence by anchoring the free edges of pericardial fenestration overlying the superior vena cava and right atrium to the chest wall. Follow-up showed no recurrence compared to 3.5% in the conventional procedure.

Keywords: Pericardial Effusion. Pericardial Window Techniques. Pericardiocentesis. Vena Cava, Superior.

INTRODUCTION

Recurrent pericardial effusion is a debilitating condition for patients with chronic pathologies such as malignancy and autoimmune disorders. Rapid accumulation will shortly compromise hemodynamics and progress to tamponading collection, heart failure, and obstructive shock. In recurrent effusions, the main aim of management is not only to decompress the pericardium but also to decrease the future recurrence as the underlying etiologies are chronic or refractory to treatment. The optimal management with a relatively low recurrence rate is pericardial window. With thoracoscopic pleuropericardial window, better exposure is achieved allowing for the removal of sufficient pericardium to form a wider durable window and management of concomitant pleural pathologies^[1,2]. However, the incidence of recurrence with this approach is reported in up to 12% of cases^[3,4].

TECHNIQUE

A right-sided uniportal video-assisted thoracoscopic surgical approach was performed as usual. The modification entails anchoring of the free edges of pericardium overlying the superior vena cava and right atrium to the chest wall with VICRYL® sutures, creating a tent-like curtain as demonstrated in the Video 1 and Figure 1. This technique will prevent future adhesions between the edges of the pericardium, leading to a permanent wide connection between the pericardium and pleura cavities, with subsequent practical elimination of any possibility of recurrence. The pericardium was grasped, divided starting from the superior pulmonary veins down to the diaphragm till a satisfactory window of at least 4x4 cm is established. The phrenic nerve was being visualized throughout the procedure. The sucker was used to drain any collection and to break down any loculations. We have applied

Correspondence Address:

Hanan M. Hemead

 <https://orcid.org/0000-0001-9790-1021>

Cardiothoracic Surgery Department, Faculty of Medicine

Khartoum square, Alexandria, Egypt

Zip Code: 0020

E-mail: hana_hemead@yahoo.com

Article received on August 17th, 2021.

Article accepted on February 17th, 2022.



Video 1 - Suturing of the free pericardial edge to the anterior chest wall to minimize chances of recurrence during the procedure of video-assisted thoracic surgery pleuropericardial window for a malignant pleural effusion.

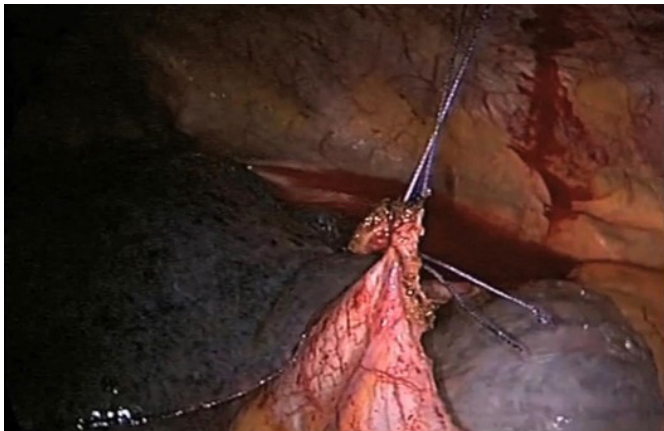


Fig. 1 - The free edge of pericardium in front of the right side of the heart is sutured to the chest wall.

this technique for 38 patients with recurrent pericardial effusion for various pathologies during a three-year period. The mean follow-up duration was 1.2 +/- 1 year. Recurrence was not reported in any of the patients compared to a 3.5% recurrence in individuals who underwent the conventional technique previously.

DISCUSSION

Recurrent pericardial effusion is burdensome for patients and surgeons particularly in patients with long-life expectancy. Ideally, the creation of a pleuropericardial window allows for the ongoing drainage of any effusion to the pleural space preventing the evolution of tamponading effect in the settings of effusive pericarditis. It is hypothesized that effective drainage achieved by a generous persistence window will allow for the development of symphysis and subsequent adhesions between the epicardium and the overlying pericardium. Therefore, early complete evacuation of the effusion and establishment of a persistent drainage will potentially eliminate the chances of recurrence by facilitating the development of adhesions due to inflammation and surgical trauma^[5]. This suggests that the reported recurrence encountered in the standard procedure is due to early failure of the window to survive long enough to drain the collection adequately to facilitate the coaptation of the epicardium and overlying remaining pericardium. Therefore, the modified technique allows

continuous drainage in chronic conditions. Notably, in such cases, the pericardium is stiff and non-stretchable, therefore, even a small effusion might result in hemodynamic collapse^[6].

CONCLUSION

The modified technique allows for formation of a sustained orifice that serves for initial efficient removal of the collection and persistent efflux of ongoing effusion in patients with chronic conditions and expected long survival. Therefore, this technique makes the virtual odds of relapse almost approaching zero.

No financial support.
No conflict of interest.

Authors' Roles & Responsibilities

- HMH Substantial contributions to the analysis and interpretation of data for the work; drafting the work; agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved; final approval of the version to be published
- AS Substantial contributions to the conception and design of the work; agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved; final approval of the version to be published
- WH Substantial contributions to the conception and design of the work; and analysis and interpretation of data for the work; drafting the work and revising it critically for important intellectual content; agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved; final approval of the version to be published

REFERENCES

1. Uramoto H, Hanagiri T. Video-assisted thoracoscopic pericardiectomy for malignant pericardial effusion. *Anticancer Res.* 2010;30(11):4691-4.
2. Muhammad MI. The pericardial window: is a video-assisted thoracoscopy approach better than a surgical approach? *Interact Cardiovasc Thorac Surg.* 2011;12(2):174-8. doi:10.1510/icvts.2010.243725.
3. O'Brien PK, Kucharczuk JC, Marshall MB, Friedberg JS, Chen Z, Kaiser LR, et al. Comparative study of subxiphoid versus video-thoracoscopic pericardial "window". *Ann Thorac Surg.* 2005;80(6):2013-9. doi:10.1016/j.athoracsur.2005.05.059.
4. Bary MA, Abdel-aal KM, Mohamed RG, Abdel-maboud AM, Helmy AA. Video-assisted thoracoscopic pericardial window for massive pericardial effusion: South Egypt experience. *J Egypt Soc Cardiothorac Surg.* 2017;25(1):73-8. doi:10.1016/j.jescts.2017.02.005.
5. Sakanoue I, Hamakawa H, Okubo Y, Minami K, Miyamoto E, Shomura Y, et al. Efficacy and safety of thoracoscopic pericardial window in patients with pericardial effusions: a single-center case series. *J Cardiothorac Surg.* 2016;11(1):92. doi:10.1186/s13019-016-0488-x.
6. Restrepo CS, Lemos DF, Lemos JA, Velasquez E, Diethelm L, Ovella TA, et al. Imaging findings in cardiac tamponade with emphasis on CT. *Radiographics.* 2007;27(6):1595-610. doi:10.1148/rg.276065002.



This is an open-access article distributed under the terms of the Creative Commons Attribution License.