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Video Presentation

Total pericardiectomy via median sternotomy (Holman and Willett): a video presentation

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For uniformity with other studies, total pericardiectomy was defined as wide excision of the pericardium with the phrenic nerves defining the posterior extent, the great vessels including the intrapericardial portion of superior vena cava and superior vena cava-right atrial junction defining the superior extent, and the diaphragmatic surface, including the inferior vena cava-right atrial junction defining the inferior extent of the pericardial resection. Radical pericardiectomy was defined as excision of the pericardium as defined under total pericardiectomy including the removal of the pericardium posterior to the phrenic nerve and the diaphragmatic pericardium. Constricting layers of the epicardium were removed whenever possible. The atria and venae cavae were decorticated as a routine.

In our previous investigation, we offered cogent and respected reasons for selection of surgical approach in patients undergoing pericardiectomy and demonstrated that total pericardiectomy is associated with lower perioperative and late mortality, less postoperative low cardiac output syndrome, early normalization of hemodynamics and better long-term survival compared with partial pericardiectomy and this is more easily accomplished through median sternotomy [1,2]. We report herein the step-by-step surgical details of total pericardiectomy without utilizing cardiopulmonary bypass via median sternotomy.

A 38-year-old man diagnosed with calcific chronic constrictive pericardiectomy in New York Heart Association class IV underwent total pericardiectomy via median sternotomy. The postoperative recovery was uneventful.

Surgical procedure

1. The chest is entered through the mid-sternotomy incision.
2. The thymus is subtotally excised to expose the pericardium overlying the aorta and pulmonary artery. Subsequently, the thymus and pleural reflection are mobilized laterally to obtain a wide width of the pericardium.
3. Both pleural cavities are entered to visualize both phrenic nerves and to decompress the pleural effusion.
4. The pericardium is inspected and palpated to determine a soft uncalcified area. It is important to remove the large amount of fat which usually overlies the apex in proximity to the left phrenic nerve.
5. An I-shaped incision is made in the midline over the pericardium to the level of the pulmonary artery superiorly and diaphragm inferiorly. The dissection of the pericardium of the heart is done using cautery until its serous layer. There is a clear visualization of the epicardial fat and the coronary vessels.

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6. Cautery is set between 8 and 10 mv during the process of dissection to avoid cautery induced ventricular fibrillation.
7. Multiple silk stay sutures are placed on the cut edges of the incised pericardium. The pericardium is initially divided at the bottom portion of the diaphragmatic reflection over the right ventricle and lateral pericardial flap is raised superiorly and laterally.
8. The mobilization of the pericardium is started at the lower end of the "T" incision on the left side and proceeded upward towards aorta till the lower border of the brachiocephalic vein.
9. The flap is divided at the mid portion to facilitate mobilization with minimal compression/manipulation of the cardiac chambers/great vessels, thereby maintaining hemodynamic stability. The posterior extent of the dissection is approximately 1 cm anterior to the left phrenic nerve.
10. A plane is developed between the diaphragmatic pericardium and the diaphragm. Three to four silk stay sutures are placed on the edges of the diaphragmatic pericardium dividing into two halves.
11. Dissection is done between the pericardium and the posterolateral left ventricular wall and along the inferior walls of the left and right ventricles. Posterolaterally, the pericardium posterior to the left phrenic nerve down to the left-sided pulmonary veins is dissected and excised, thus freeing the left ventricular apex.
12. Next the dissection proceeds laterally on the right side in a similar fashion as was done on the left side. The right pericardial flap is divided in the midportion and carefully dissected avoiding injury to the underlying right atrium, superior and inferior cavo-atrial junction. The posterior extent of the dissection line is approximately 1 cm anterior to the right phrenic nerve.
13. The diaphragmatic pericardium on the right side is dissected off the diaphragm avoiding injury to the dilated and thinned inferior caval vein. The pericardial and pleural cavities are irrigated with normal saline.

Conflict of interest

The authors declare no conflict of interest.

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