New ideas - Thoracic oncologic

Left paraxiphoidian approach for drainage of pericardial effusions

Cezar Motas*, Natalia Motas, Ovidiu Rus, Teodor Horvat

Clinic of Thoracic Surgery, Emergency Central Military Clinical Hospital, 134th Calea Plevnei Street, District 6, Bucharest, 010242, Romania

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Abstract

Pericardial effusion is one of the frequent complications of malignancies, up to 15–20% of the autopsy specimens showing pericardial or cardiac metastasis. Often the pericardial fluid accumulates in large quantities leading to cardiac tamponade, which can be fatal in the absence of appropriate treatment. The authors present another type of pericardial drainage: the approach is paraxiphoidian, not subxiphoidian or with xiphoid resection. Without xiphoid process resection, the surgery is better tolerated by patients in the absence of appropriate treatment.

Keywords: Subxiphoid pericardial window; Cardiac tamponade; Neoplasic pericardial effusion

1. Introduction

Pericardial effusion is one of the frequent complications of malignancies, up to 15–20% of the autopsy specimens showing metastasis at the pericardial or cardiac level [1]. Often the pericardial fluid accumulates in large quantities leading to cardiac tamponade, which can be fatal in the absence of appropriate treatment.

In most of the cases, minimal invasive pericardial fluid drainage is enough to improve the symptoms in these critically ill patients. This can be achieved either through percutaneous subxiphoidian approach or via minimal invasive surgery, like subxiphoidian of trans-pleural pericardial window.

It should be noted that fine line blood pressure in these patients is maintained by increased sympathetic tonus, which will augment cardiac inotropic response and peripheral vasoconstriction [2]. It is known that during general anesthesia induction there is a sympatholytic effect which usually decompensates the patient, and for this reason it should be avoided for surgical intervention. In most of the cases, the subxiphoidian pericardial drainage is done under local anesthesia only.

2. Technique

The first to describe the subxiphoidian pericardial drainage technique was Larrey in 1829 [3]. In 1900, Allingham [4] started to popularise the procedure, but it was Fontaine et al. in 1970 who implemented the current technique of subxiphoidian pericardial fluid drainage [5].

The current technique of subxiphoidian pericardial window [2, 6] implies a median incision just inferior to the xiphoid process followed by the opening of the white line with exposure of the superior aspect of the diaphragm cupola. The next step is removing the xiphoid process from the field either by hard retraction or by excision; this facilitates the access to pericardium. Then, the pericardium is opened and a small piece is taken for biopsy, followed by drainage of the fluid.

We are proposing a new, shorter and easier approach for pericardial exposure. After local anesthesia with lidocaine 1%, we perform the median incision above the xiphoid process. Using electrocautery, the incision is extended to the deep subcutaneous tissue with exposure of the xiphoid process. Then we perform de-insertion of the left rectus abdominal head from the xiphoid process. This gives an easy access to the superior site of the diaphragmatic cupula, just in close proximity of the maximal pericardial bulge area (Fig. 1). After removal of the pre-pericardial fat, there is direct visualization of the pericardium, which permits controlled puncture, and slow drainage of the fluid, usually in tension. The next step is the biopsy of the pericardium. This technique allows the collection of a piece of the pericardium (usually up to about 4 cm in diameter) (Fig. 2). Then the pericardial sac is inspected either under direct visualization or using the endoscopic technique, with the possibility of obtaining biopsy samples from different locations. The final step is the placement of an intrapericardial drain via counter-incision and closure of the deep and superficial layers in anatomical planes.
Between October 2006 and July 2008, five patients with pericardial effusion were surgically treated by this procedure. In two cases, the pericardial disease appeared in patients with malignancies (bronchopulmonary cancer under chemotherapy). These two cases were surgical emergencies (pericardial effusions with cardiac tamponade), the pericardial biopsy confirming the pericardial malignancies: the same histological type as the pulmonary epidermoid lesion.

In the other three cases, the patients were diagnosed with pericardial effusion with long time evolution, without medical response to conservative treatment. In these situations, the endoscopic visual pericardial exploration was helpful, the biopsy excluding any pericardial malignancies. In all the five cases, the endoscopic pericardial evaluation was very good and the pericardial fragment was sufficient for histopathological and immunohistochemical study. There were no difficulties during surgery and despite using local anesthesia, intra- and postoperative chest pain was minimal.

3. Comment

We consider that this novel technique offers certain advantages over the classical approach:

1. It gives the possibility to make the pericardial drainage without being incommmoded by the xiphoid process and does not require its resection (as we have mentioned before, this procedure is often done under local anesthesia and resection of this bone fragment can be very painful);
2. Although there is the possibility of subxiphoidian approach without the resection of the xiphoid process, we consider that in the paraxiphoidian approach access is done in the place of maximum convexity of the pericardium in tension; there is no need to ‘avoid’ the xiphoidian process, access to pericardium being facilitated due to the use of the shortest way to it;
3. The surgical intervention can be safely and comfortably done under local anesthesia in these critically ill patients;
4. We have not seen any hemorrhagic incidents during intervention (the closest vessels, the anastomoses between the inferior epigastric and left internal mamalian blood vessels are at a distance of approximately 1 cm);
5. The approach site is far away from the pleural spaces and there is no danger to accidentally open them.

References


eComment: Pericardiocentesis followed by intrapericardial cisplatin administration in patients with neoplastic pericarditis

Authors: Nikoalos Barbetakis, Department of Thoracic Surgery, Theagenio Cancer Hospital, A. Simeonidi 2, 54007 Thessaloniki, Greece; Christos Asteriou, Fani Papadopoulou, Theodoros Bischiniotis
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We read with great interest the article by Motas et al. concerning a novel surgical technique for drainage of pericardial effusions. We would like to congratulate them for their very good results [1].
The aim of our brief comment is to highlight the advantages of pericardiocentesis followed by intrapericardial cisplatin administration in patients with neoplastic pericarditis. Malignant involvement of the pericardium is not uncommon especially in patients with advanced lung cancer and is related to the mechanism of mortality in one-third of the cases [2]. Increase in pericardial fluid may cause life-threatening cardiac tamponade in patients with satisfactory survival prospects.

The acute treatment of malignant cardiac tamponade involves prompt, complete removal of pericardial fluid by pericardiocentesis or surgical intervention, but recurrence of malignant pericardial effusion and subsequently tamponade is not unusual. Therapeutic strategies remain controversial. In our centre, we favor pericardiocentesis and subsequent cisplatin instillation as the method for preventing recurrence of malignant pericardial effusion, especially in patients with lung cancer. Our results were documented during a 5-year period study [3].

Pericardiocentesis followed by intrapericardial administration of cisplatin is safe and effective in preventing the reaccumulation of malignant pericardial effusion in the majority of oncology patients.

References

