Surgical Technique

Sub-xiphoid surgical pericardial drainage for cardiac tamponnade

V. Peveri a, M. Pocard a,*, E. Martinod b, c

a Paris Diderot University, Sorbonne Paris Cité, AP—HP, Surgical Oncologic and Digestive Unit, Lariboisière Hospital, 2, rue Ambroise-Paré, 75010 Paris, France

b Université Paris 13, UPRES Sorbonne Paris Cité, 93206 Saint-Denis, France

c AP—HP, Department of Thoracic and Vascular Surgery, Avicenne Hospital, 93009 Bobigny, France

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Introduction

Pericardial effusion is a pathologic increase in the amount of pericardial fluid that can cause intra-pericardial pressure to increase exponentially, resulting in compression of the heart due to the minimal distensibility of the pericardial envelope. Many different pathologies may lead to an increase in pericardial fluid that exceeds physiologic norms (acute myocardial infarction, metabolic, infectious, neoplastic, chronic systemic autoimmune/inflammatory diseases, iatrogenic, trauma, aortic dissection, and idiopathic causes).

Ultrasound-guided pericardiocentesis is currently the most commonly used treatment, particularly for pericardial effusions due to non-traumatic conditions, allowing effective drainage and providing fluid for bacteriologic and cytologic examination.

Creation of a pericardial window is a valid alternative, particularly when a biopsy is necessary or if pericardial effusion is due to a cardiac wound.

When the pericardial effusion results in threatened cardiac tamponnade or when there is suspicion of post-traumatic hemopericardium, pericardial drainage should be performed surgically as an emergency, and any surgeon of whatever specialty should be prepared to carry this out.

* Corresponding author. Hôpital Lariboisière, département de pathologie digestive, unité médicale de chirurgie digestive, 2, rue Ambroise-Paré, 75010 Paris, France. Tel.: +33 1 49 95 82 58; fax: +33 1 42 11 52 13. E-mail address: marc.pocard@gmail.com (M. Pocard).

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1 Patient position and incision
The patient lies supine, usually in a semi-seated posture. The field is draped to include the neck, the thorax and the abdomen. The operator stands to the patient’s right with the assistant on the opposite side. The surgical tray should include Farabeuf retractors, Kocher clamps, long Schnitt hemostats, and DeBakey forceps. A tray with sternotomy instruments should be available in the room with a sternal saw (if available). A 5 cm long vertical sub-xiphoid incision about 5 cm is made.

2 Exposure and freeing up of the xiphoid process
The subcutaneous tissue is divided and a Beckmann self-retaining retractor is inserted. The midline linea alba is incised without opening the peritoneum. The xiphoid process is isolated with a finger and its muscular attachments are divided.
3 **Exposure of the pericardium**
Finger dissection is carried upward and to the left in the retro-sternal space. The muscles and pericardial fat are displaced until the gray-colored pericardium is brought into view.

4 **Opening of the pericardium, evacuation of the effusion, and creation of a pericardial window**
The pericardium is incised with a scalpel or scissors. The effusion may be under considerable pressure. Fluid is collected for bacteriologic and cytologic testing. The pericardium is left open and plicated laterally with interrupted non-absorbable sutures to create a permanent fenestration. The same result can be obtained by suturing the pericardial edge to the peritoneum.
Drainage

A non-aspirative flexible drain is left in the pericardium exiting above the fascial aponeurosis lateral to the midline.

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.