



Compressive Pericardial Effusion: Percutaneous puncture or open- surgery

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Key words: pericardial effusion, cardiac tamponade, pericardocentesis, pericardotomy, percutaneous puncture, emergency, echo cardiography

Summary:

Compressive pericardial effusion is a diagnostic and therapeutic emergency. It results in acute circulatory insufficiency that involves the vital prognosis.

The diagnosis is simple. It is based on clinical arguments and is confirmed by echocardiography.

The management necessarily involves emptying the pericardium supplemented by symptomatic treatment that combines vascular filling with active vaso amines.

Two techniques are possible for pericardial drainage, either percutaneous puncture/drainage (pericardocentesis) ultrasound guided or not, or open-surgical drainage (pericardotomy).

According to the latest recommendations (ESC-Guidelines 2015), the pericardial puncture is in principle the method of choice for all important pericardial effusions, its simplicity and its safety makes it the technique of choice in emergency.

Our study confirmed the benefits and safety of the technique in emergencies

Introduction:

Compressive pericardial effusion is a diagnostic and therapeutic emergency that engages the vital prognosis.

The compression of the heart cavities by the fluid that accumulates in the pericardium is responsible for acute circulatory insufficiency with right heart failure then secondarily global cardiac failure.

The diagnosis is simple. It is based on clinical arguments and is confirmed by echocardiography^[1,2].

Emergency management involves emptying the pericardium, which can be done by pericardotomy (open surgery) or percutaneous drainage (pericardocentèse). The drainage of the pericardium is associated with a symptomatic treatment that combines vascular filling and

administration of vasoactive amines and it must be completed by an investigation and etiological treatment.

The drainage is indicated to drain the pericardium and to lift the compression of the heart cavities but also to collect fluid and/or pericardial tissue for a chemical, microbiological, cytological or histopathological analysis aimed etiological.

Two techniques are possible, either percutaneous puncture/drainage or surgical drainage.

Percutaneous puncture/drainage or pericardiocentesis is a simple needle puncture completed by the placement of a catheter introduced into the pericardium according to Seldinger's technique. The puncture is done on anatomical landmarks and can be guided or not by ultrasound^[3].

This technique has many advantages. It is minimally invasive; it can be done under local anesthesia, and in the patient's bed. The placement of the catheter left in place for 24-48 hours allows a gradual evacuation of the effusion; it avoids early recurrences and authorizes the administration of medications locally.

Pericardiocentesis is a simple technique; the learning curve for practitioners is short and complications rare^[4]. The major disadvantage of this technique is that it does not allow biopsy of the pericardium.

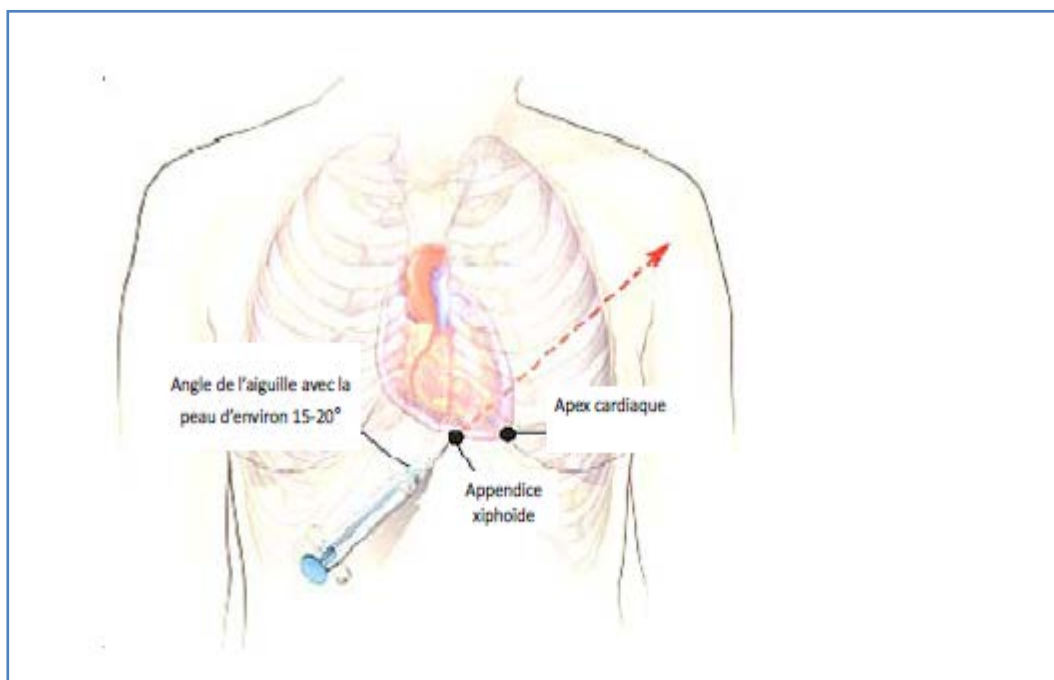


Figure 1. Schematic representation of a pericardiocentesis (sub-xiphoid puncture directed to the left shoulder, with systematic echocardiographic tracking and tracing). [2]

Surgical drainage or pericardotomy requires a surgical approach of the pericardium by sub-xiphoid or left anterior thoracotomy in a patient under local or general anesthesia.

This surgical technique makes it possible to carry out at the same time a pericardial biopsy in search of a cause of the tamponade. A pleuro-pericardial window may be associated with this gesture in order to drain the recurrent pericardial effusion by adjacency in the left pleura^[2].

According to the latest recommendations (ESC-Guidelines 2015) ^[5,6], pericardial puncture is in principle the method of choice or preferred method for all major pericardial effusions. Its simplicity and safety make it the preferred technique in emergencies.

However, it is contraindicated in case of acute dissection of the ascending aorta (type A), the patient must be treated with open- surgery ^[7,8].

The other indications for which the surgery is most interesting are ^[7]:

- Coagulopathy, anticoagulant therapy, thrombocytopenia (<50,000/mm3);
- Encapsulated effusion;
- Acute traumatic effusion;
- Purulent or neoplastic effusion;
- Post-cardiac effusion.

The study aimed to optimize the management of patients who arrive in the emergencies with a compressive pericardial effusion.

Methods:

We conducted a monocentric retrospective observational study spanning two time periods (1998-2003 and 2006-2011), the main objective is to demonstrate the feasibility and safety of the pericardocentesis based on anatomical landmarks (without echo guidance) in an emergency.

We included all patients admitted for compressive pericardial effusion. The criteria for non inclusion are effusion associated with a dissection of the thoracic aorta, a heart wound, or the rupture of a free wall of the heart.

Percutaneous drainage puncture (without echo guidance) is used in the first intention, surgery is only proposed secondarily in case of failure of the first technique.

The technique adopted consists of:

- 45° supine patient, standard monitoring, under local anesthesia,
- Sub-xiphoid puncture directed to the left shoulder,
- Insertion of a catheter using the Seldinger technique,
- Liquid evacuation by siphoning,
- Removal of the catheter after the liquid has dried up.

The judgment criteria used are the complications related to the technique

Results:

Over a 12-year period, 103 patients were treated. The sex ratio was 1.3, the average age of the patients is 55.67 years [21.51-63.39] with extremes ranging from 02 years to 78 years. The most present age class is 40-49 years.

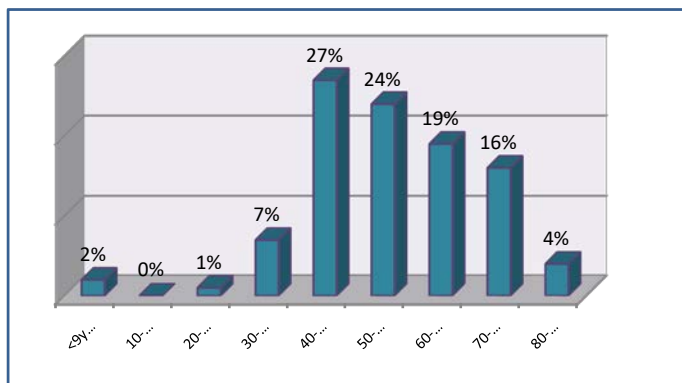


Figure 2: Age distribution

Discharge of the effusion was accomplished by percutaneous puncture/drainage in the patient's bed. The pericardiocentesis was effective in 94% of cases, in 04 cases (4%) there was failure of the technique, and patients were admitted to the operating room for surgical drainage.

The etiology found was neoplastic in 47% of cases, breast cancer in the majority of cases. The diagnosis of neoplasia was known in our patients in 92% of cases and in the remaining 8% of cases, the cytological study of the fluid allowed to make the diagnosis. Pericardial biopsy indication did not apply for this series of patients

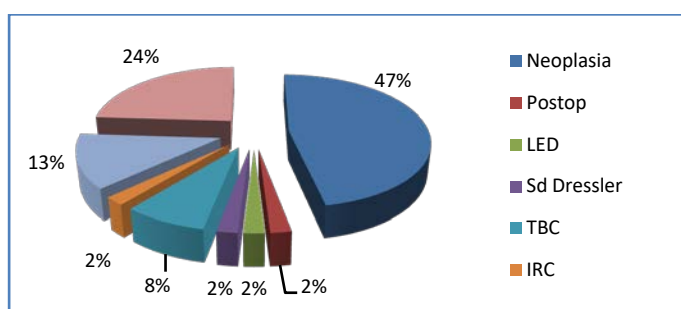


Figure 3: Distribution by Etiology

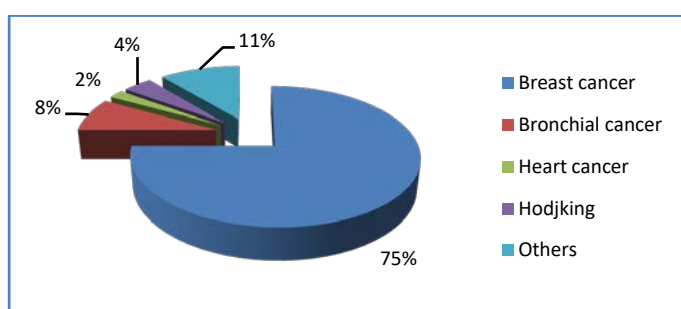


Figure 4: Type of neoplasia found

The lenght of hospital stay in the emergencies was less than 24 hours with an average duration of 18.43h [06.53-21.94]. After the evacuation of the pericardial effusion, patients are referred to the various inpatient services for etiological investigation and subsequent follow-up.

Apart from the 04 failures, the complications of the technique were rare and unimportant.

The early mortality for these patients was 3%, related to the initial pathology (neoplasia), no deaths are attributed to the procedure.

Complications	N	%
Failure	04	04%
Vagal Shock	05	5%
Inotropic use	02	02%
Recidive of effusion	39	39%
No complications	80	78%

Table 1: Complications during drainage

Discussion:

The effectiveness of percutaneous puncture/drainage is comparable to that of surgical drainage^[9].

A retrospective clinical study (Gumrukcuoglu HA ,Cardiol Res Pract 2011) published in 2011 involving a group of 100 patients with cardiac tamponade included consecutively demonstrated relative safety pericardocentesis^[10]

Complications of pericardocentesis are rare^[6] making it a good alternative to surgical drainage. According to the latest recommendations from the European Society of Cardiology (ESC2015)^[6], percutaneous drainage is the method of choice for all major pericardial effusions. Our study confirmed the benefits and safety of the technique in emergencies.

The drainage remains surgical in some cases including cases of hematic effusion or the pericardium is filled from the heart cavities or aorta. In these particular cases, open surgery is used to evacuate the effusion and stop feeding the pericardial sac.

A raised limit for pericardocentesis is that it does not allow biopsy of the pericardium. Surgical approach is required whenever a pericardial biopsy for diagnosis is desired^[11].

Conclusion:

Compressive pericardial effusion is a circulatory failure related to compression of the heart cavities by the accumulation of fluid in the pericardial sac. Its treatment involves emptying the pericardium ideally ensured by the pericardocentesis.

The percutaneous drainage puncture is a salutary and saving gesture in front of the tamponade. It is a simple, fast and inexpensive technique. Performed under conditions of sufficient safety for the patient and after adequate learning; its complications remain very infrequent. It should therefore have very broad indications in the emergency treatment of compressive pericardial effusion.

Declaration of conflicts of interest:

The authors declare that they have no conflict of interest

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