How-to-do-it

The management of malignant pericardial effusions using permanently implanted devices

Franca M.A. Melfi*, Gian Franco Menconi, Antonio Chella, Carlo Alberto Angeletti

Division of Thoracic Surgery – Cardiac and Thoracic Department, University of Pisa, Via Paradisa 2, 56124 Pisa, Italy

Received 14 September 2001; received in revised form 20 November 2001; accepted 24 November 2001

Abstract

We present a new approach utilising VATS and a Port-system (Medi-Port MP-GS9; IAP-HMP) that allows home management of pericardial effusion in patients with advanced malignancy and recurrent effusion. All patients underwent thoracoscopic pericardial window under general anaesthesia. On completion of this procedure a Port-system was permanently implanted with the reservoir body placed in a subcutaneous pocket and the outlet catheter inserted into the pleural cavity which allows aspiration of the effusion at home, on becoming symptomatic. © 2002 Elsevier Science B.V. All rights reserved.

Keywords: Malignant effusion; Pericardial window; Thoracoscopy

1. Introduction

Malignant pericardial effusions (MPE) occur in approximately 21% of all patients with advanced malignancies [1]. Although only a small percentage of these patients eventually require intervention, the approach to this problem must be efficient and associated with a low morbidity. VATS has been suggested as an attractive alternative to a surgical approach with acceptable results in terms of procedure-related complications and recurrence [2–4]. Based on our experience in managing pleural effusion using a Port-system, we applied this procedure to terminally ill cancer patients with recurrent MPE, obtaining an effective management of the effusion with long-term palliation at home.

2. Methods

Between February 1993 and February 2001, 40 patients with advanced malignancies were referred to our service for large and recurrent pericardial effusion after pericardiocentesis. There were 27 men and 13 women (34–83 years; mean age 62 years). All patients were terminally ill with a short-life expectancy (exceeding 3 months). Nineteen effusions (47.5%) were secondary to lung cancer. Breast cancer, lymphomas and oesophageal or colon carcinoma were the primary tumours in 6 (15%), 3 (7.5%) and 4 (10%) effusions, respectively and adenocarcinoma of an unknown primary tumour in four effusions (10%). Other tumours included melanoma, mesothelioma, kidney and endometrial carcinoma. Eleven patients had clinical or echocardiographic evidence of pericardial tamponade, nine presented dyspnea, 11 fatigue and malaise, five tachycardia and four were asymptomatic but with recurrent effusion after several pericardiocentesis. The procedure was performed under general anaesthesia using a double lumen tube.

The initial scope incision was placed in the sixth intercostal space in the midaxillary line and one additional incision was made in the fifth space. Under direct vision an incision was made on the surface of the pericardium, using electrocautery, to create an adequate window (minimum size of $3 \times 3$ cm). The median volume of pericardial fluid evacuated was 885 ml (range 600–2300 ml). The fluid and the specimen were sent for cytological and pathological evaluation. On completion of the procedure, a device was positioned in the pleural cavity. We employed a Medi-Port MP-GS9 in the first 12 patients; in the remaining patients we used the Infuse A-Port-Implantation (IAP) H.M.P. The device consisted of a rigid volcano-shaped reservoir body, an inlet septum held in the centre of the reservoir body and a silicone rubber outlet catheter. The installation on IV/V intercostal space on the mean auxillary line and one additional incision was made in the fifth space. Under direct vision an incision was made on the surface of the pericardium, using electrocautery, to create an adequate window (minimum size of $3 \times 3$ cm). The median volume of pericardial fluid evacuated was 885 ml (range 600–2300 ml). The fluid and the specimen were sent for cytological and pathological evaluation. On completion of the procedure, a device was positioned in the pleural cavity. We employed a Medi-Port MP-GS9 in the first 12 patients; in the remaining patients we used the Infuse A-Port-Implantation (IAP) H.M.P. The device consisted of a rigid volcano-shaped reservoir body, an inlet septum held in the centre of the reservoir body and a silicone rubber outlet catheter. The installation on IV/V intercostal space on the mean auxillary line consisted of: a tunnel through the pocket and a point selected for the introduction of the catheter.
ter which was placed in the pleural space (Fig. 2); preferably in the costo-phrenic sinus which was facilitated using an endo-grasp; then the system was washed with heparin diluted to 3:10 with a physiological solution. A chest tube was inserted through one of the thoracoport sites into the chest cavity and was removed on the first post-operative day. Patients without hemodynamic instability were allowed to walk on the first post-operative day and when they were independent, discharged home. The port-system was employed with a mean of 3×1 times per week (range: 1–5), to evacuate the liquid until adhesions between pericardium/epicardium occurred.

3. Results

A conversion thoracotomy was required in one patient due to a thickened and fibrosed pericardium. The mean duration of hospitalisation was 2.7 days ranging from 1 to 5 days respectively. Three patients died within 15 days of surgical procedure. The mortality rate out of 27 patients was a mean of 6.1 months (range 2–13) after the surgical procedure. Currently nine are alive, with a mean of survival of 6.4 months (range 2–12). One patient was lost to follow-up after two months. No recurrent effusions were noted and the device was easily controlled at home in all cases.

4. Discussion

MPE is a sign of advanced malignancy with mean survival of a few months [1]. The optimal approach to management of MPE has remained controversial since the introduction of pericardiocentesis [5]. Excellent results from open drainage performed through a subxiphoid pericardial window or thoracotomy have been noted in many surgical series [6,7]. Pericardiocentesis may be performed to achieve rapid relief of the tamponade in hemodynamically unstable patients and is effective in 85–93% of the cases. However, this procedure is associated with complications and a death rate of 10–25 percent [5]. Surgical options also have significant morbidity, particularly respiratory complications [7,8]. Recently, the VATS technique has been used increasingly [2–4]. This approach is effective and less invasive with concomitant assessment of the pleural cavity and a complete clinical-pathologic staging. We found that the VATS window associated with the Port-system is an effective treatment for MPE and palliation of symptoms. The efficacy of this procedure depends on complete and continued drainage of pericardial fluid until adhesions between the pericardium/epicardium can occur. The port system facilitates this process and

- produces an acceptable result in terms of the control of the effusion at home and of the recurrence;
- shortness the average hospital stay;
- is cost-effective.

We conclude that this technique may reduce the morbidity stemming from MPE and its treatment by allowing patients to conveniently drain the effusion at home when it becomes symptomatic.

References


