

Long-term tunnelled PleurX® peritoneal catheters in the management of recurrent malignant ascites: Initial experience and cost effectiveness

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Objectives

- To assess the safety and efficacy of PleurX® catheters in the management of recurrent ascites in patients with advanced abdominal malignancy.
- To evaluate the cost effectiveness of PleurX® catheters compared to conventional large volume paracentesis.

Introduction

The management of malignant ascites can be problematic for clinicians and patients. No standardised protocol exists for the treatment of the cancer patient with recurrent and rapidly re-accumulating abdominal fluid. Commonly described techniques include

- Large-volume paracentesis (LVP)
- Tunnelled external drainage catheters
- Peritoneal ports
- Peritoneo-venous shunts.

The PleurX® tunnelled peritoneal catheter

- 15.5Fr. indwelling soft silicone catheter with multiple side holes
- Cuff mounted on the catheter, which is placed within a tunnel under skin analogue to tunnelled central venous catheters
- A safety valve is contained within the connector to avoid leakage
- Drainage is into sterile evacuated plastic bottles
- Fluid can be removed in a relatively short space of time (typically 9-11 minutes)

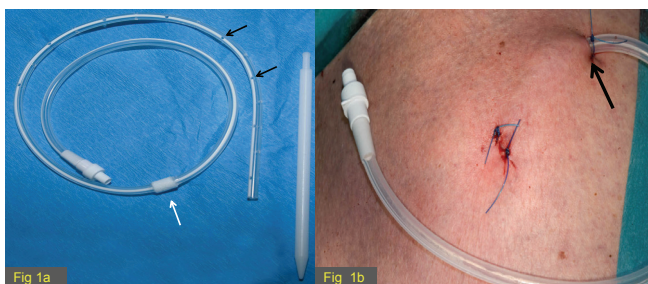


Fig 1a. PleurX catheter with fenestrations (black arrow) and polyester cuff (white arrow)
Fig 1b. Immediately after insertion. Suture at the skin exit site (arrow) helps anchor the catheter and should remain for at least 3 weeks. The lower sutures can be removed after 10 days.



Fig 1c. For drainage, an extension tube is connected to the PleurX and the fluid aspirated into a vacuum bottle

Advantages

- Avoids discomfort and potential complications of multiple paracentesis.
- Fewer hospital visits and reduced inpatient stay
- Domiciliary management of ascites
- Frequent drainage in smaller quantities avoids large build up of ascites therefore better control of symptoms.

Method

Fourteen patients with recurrent malignant ascites had 16 peritoneal PleurX catheters placed for home drainage. Patient and procedure data on prior conventional paracentesis as well as the PleurX drainage were recorded using the electronic patient data system. Cost analysis was made with the help of the hospital Finance department.

Results

All 16 procedures were technically successful with no immediate complications. Two patients had 2 catheters inserted (see below). All patients were successfully palliated until death.

Case one Displacement of catheter after inappropriate removal of the skin suture in the community at one week instead of the recommended three weeks.

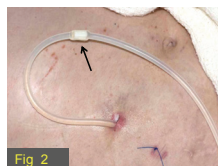


Fig 2. The wrong suture was removed after one week, resulting in migration of the drain out of the abdomen. The subcutaneous cuff is seen approximately 10cm outside the patient (arrow).

Case two Catheter ceased to function after 4 weeks due to formation of a fibrin cast and loculation of ascites. Catheter exchange and instillation of 250,000 IU streptokinase on six consecutive days through the drain allowed continued drainage and maintained patency without further intervention.

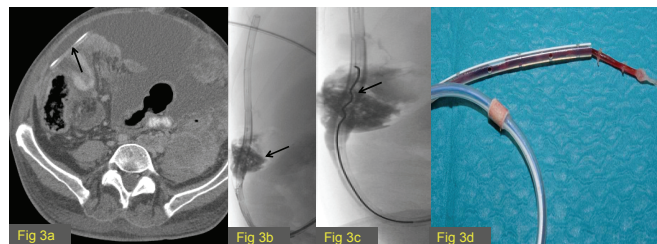


Figure 3a. Although the PleurX (arrow) is in good position there is large volume ascites. 3b. Injection of contrast shows minor flow of contrast from lower side holes (arrow), but not from the distal shaft or the tip. 3c. A guide wire inserted for recanalisation is buckling (arrow) from intraluminal resistance. 3d. Fibrin cast protruding from the removed PleurX catheter.

A median of 3.9L was drained at previous conventional inpatient paracentesis with an average hospital stay of 5.5 days. Accurate home drainage volumes with subsequent PleurX drainage were not available but an average of thirty 1L bottles are dispensed per PleurX catheter.

	Paracentesis	PleurX
Catheter	£32.00	£245.00
Connector	£6.87	Nil
Drain Fix	£4.94	Nil
Drainage Bag	£0.64p/b	Nil
11 vacuum bottles x4	Nil	£255.-
Procedural costs	£121.00	£121.00
Inpatient stay	(Average = 5 days) £2040	(Average = 3 days*) £1224
Total cost to The Christie per procedure	£2205.45	£1845.00

Table 1: Cost comparison of initial procedure.

* With development of the service this is aimed to become a daycase procedure.

Low-volume recurrence:	High-volume recurrence
Fluid accumulates at 10l / month;	Fluid accumulates at 60l / month;
2x inpatient paracentesis: £ 4409.62	3x inpatient paracentesis: £ 6614.43
10 PleurX vacuum bottles: £ 637.50	60 PleurX vacuum bottles: £ 3825.00
Monthly saving using PleurX: £ 3772.12	Monthly saving using PleurX: £ 2789.43

Table 2. Cost comparison of continued treatment using conventional paracentesis and PleurX drainage for patients with low and high volume recurrence

- Follow-on cost savings of £2700-£3700 can be expected per patient per month through the use of a PleurX catheter.
- Additional non-financial benefits are gained by vacating 10-15 inpatient bed days per patient per month.

Conclusions

- Peritoneal PleurX catheters are easy and safe to insert and allow patients control over their drainage and social independence.
- They lead to a remarkable reduction in hospital bed use and result in considerable cost savings, regardless of the volumes drained.
- Intra-abdominal streptokinase can resolve loculations of ascitic fluid and improve drainage.