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)
- Tunneled 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)

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.

Case two
Catheter ceased to function after 4 weeks due to formation of a fibrin cast and loculations 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.

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
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<tbody>
<tr>
<td>Catheter</td>
<td>£32.00</td>
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<tr>
<td>Connector</td>
<td>£0.87</td>
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<tr>
<td>Drain Fix</td>
<td>£4.94</td>
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<tr>
<td>Drain Bag</td>
<td>£0.64p/b</td>
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<tr>
<td>1l vacuum bottles x4</td>
<td>Nil</td>
</tr>
<tr>
<td>Procedural costs</td>
<td>£121.00</td>
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<tr>
<td>Inpatient stay</td>
<td>£2040 (Average = 5 days)</td>
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<tr>
<td></td>
<td>£1224 (Average = 3 days*)</td>
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<tr>
<td>Total cost to The Christie per procedure</td>
<td>£2205.45</td>
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<tr>
<td></td>
<td>£1845.00</td>
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Table 1: Cost comparison of initial procedure.
* With development of the service this is aimed to become a daycase procedure.

<table>
<thead>
<tr>
<th>Description</th>
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<tr>
<td>Fluid accumulates at 10l / month; 2x inpatient paracentesis</td>
<td>£4409.62</td>
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<tr>
<td>£637.50</td>
<td>£3825.00</td>
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Table 2: Cost comparison of continued treatment using conventional paracentesis and PleurX drainage for patients with low and high volume recurrency.
- 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.