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Management of symptomatic ascites in recurrent ovarian cancer patients using an intra-abdominal semi-permanent catheter

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Abstract

Ascites is commonly present in women with advanced-stage ovarian cancer. No standardized protocol exists for the treatment of the patient with recurrent ovarian cancer and rapidly reaccumulating malignant ascites. Palliation of symptoms is most commonly achieved through repeated paracentesis, a procedure that potentially results in injury to intra-abdominal organs, infection, and patient discomfort. Our goal was to improve patient comfort by alleviating symptoms and reducing the need for paracentesis. The Pleurx® catheter offers a number of potential advantages over traditional treatment modalities. Clearly, larger study numbers are required to quantify the morbidity associated with the Pleurx® catheter.

Key words: ascites, ovarian cancer;

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palliative oncology, symptom management

Introduction

Ascites is commonly present in women with advanced stage ovarian cancer. In patients with primary disease, ascites usually can be controlled by surgery and chemotherapy. However, in patients with recurrent disease, symptom control is more difficult due to chemoresistance. Massive ascites may cause abdominal distension, anorexia, nausea, vomiting, and respiratory compromise, which significantly affect quality of life. No standardized protocol exists for the treatment of the patient with recurrent ovarian cancer and rapidly reaccumulating malignant ascites. Palliation of symptoms is most commonly achieved through repeated paracentesis, a procedure that potentially results in injury to intra-abdominal organs, infection, and patient discomfort. The procedure involves intra-abdominal insertion of a drainage catheter and gravity or vacuum drainage of the ascitic fluid. In many patients, paracentesis is the only effective measure of palliation, necessitating frequent

hospital visits, often until the end of life.

Alternatives to paracentesis include intraperitoneal administration of radioactive colloids, chemotherapeutic agents, or biological response modifiers.¹⁻¹⁵ The benefit in most patients is short-lived, and these agents are not effective in recurrent disease. A number of mechanical interventions have been attempted since the early 1980s, including peritoneovenous shunts, peritoneogastric shunts, and peritoneocystic shunts. None of these have become standard due to the need for general anesthesia and complications of placement. Complications have included fluid overload, respiratory compromise, superior *vena cava* thrombosis or occlusion, infection, pulmonary edema, and pseudo-occlusion due to elevated central venous pressure.¹⁶⁻¹⁹ A permanent silastic drain has been reported in 17 patients with promising results.²⁰ The drain was placed under local anesthesia and eliminated the need for paracentesis in all patients studied with minimal complications. However, the drain is not available for general use.

Similar to malignant abdominal ascites, malignant pleural effusion is a



Figure 1. The Pleurx[®] catheter system. Pictured is the silastic catheter attached to a disposable drainage bottle. The catheter is accessed in a sterile fashion at each drainage and the bottle is discarded after each use.

condition of end-stage disease that severely compromises patient comfort and for which mechanical drainage is often the only form of palliation. A drainage system has been developed for complete outpatient management of recurrent malignant pleural effusion. The Pleurx[®] catheter (manufactured by Denver Biomaterials, Golden, CO) has been developed to enable patients to manage the drainage of malignant pleural effusion at home and has been shown to reduce length of stay and hospital charges for these patients without significant morbidity.²¹

We hypothesized that intra-abdominal placement of the Pleurx catheter may offer an alternative to the management of malignant abdominal ascites in patients with recurrent ovarian cancer, who are undergoing repeated paracentesis for palliation. Our goal was to improve patient comfort by alleviating symptoms and reducing the need for paracentesis,

while avoiding the complications encountered in previously described drainage methods. We describe the use of the Pleurx catheter for drainage of intractable abdominal ascites in three patients with recurrent ovarian cancer.

Case 1

ML was an 83-year-old female with recurrent, Stage IIIC, mixed müllerian mesodermal tumor of the ovary. Her recurrent disease was characterized by rapidly reaccumulating ascites, for which she was receiving pegylated liposomal doxorubicin as well as paracentesis for relief of symptoms related to the ascites. During five months of chemotherapy, she developed worsening massive abdominal ascites, requiring repeated paracentesis. By the second month of treatment, she was undergoing paracentesis weekly to alleviate the nausea, dyspnea, leg swelling, and pain associated with her ascites. After 12 consecutive weekly paracentesis procedures, during which the patient became increasingly frustrated with hospital visits and compromised quality of life imposed by her ascites, approval for off-label compassionate use of a Pleurx catheter was obtained and it was placed intraperitoneally in the operating room, with removal of five liters of ascites. ML returned home, where her daughter drained her ascites twice weekly. She returned to the hospital once during the next six weeks due to dehydration and was discharged home after an overnight stay. She required no further paracentesis and died at home six weeks later.

Case 2

EW was a 76-year-old female with recurrent, poorly differentiated, papillary serous adenocarcinoma of the ovary, originally Stage IIC. Her recurrent disease was also characterized by

rapidly reaccumulating abdominal ascites, which caused her persistent nausea, vomiting, and abdominal discomfort. She was receiving pegylated liposomal doxorubicin for disease progression. After paracentesis was performed seven times with reaccumulation within one week of each procedure, the patient elected to undergo intra-abdominal placement of the Pleurx catheter. She did well post-operatively, but had rapidly progressive disease and died seven weeks after placement. She had a two-day admission for pain control and treatment of a urinary tract infection. She required no further paracentesis, as her ascites was well controlled with catheter mediated drainage one to two times weekly by a home health nurse.

Case 3

RF was a 50-year-old female with recurrent Grade 2 papillary serous carcinoma of the ovary with progressively worsening symptomatic ascites, requiring paracentesis of two to three liters of ascites every one to three weeks for nausea, decreased appetite, and energy level, which resolved after her taps, but returned with fluid accumulation. A Pleurx catheter was placed with intra-operative drainage of 2.5 liters of ascites and no complications. Subsequent to catheter placement, she drained her ascites at home weekly for 12 weeks and required no further paracentesis. She developed neutropenic fever while being treated with Topotecan and had the catheter removed as a precaution and due to decreased ascites formation. She required no further paracentesis, and died six weeks after removal, from causes related to her progressive ovarian cancer.

Placement of the Pleurx[®] catheter

The Pleurx is a one-way valved silicone catheter that is used for home



Figure 2. Intra-abdominal placement of the Pleurx® catheter. The catheters were placed under sedation in a sterile field.

management of malignant pleural effusions (Figure 1). It is a system that has been shown to provide comparable relief of dyspnea and restore quality of life as a chest tube with a sclerosing agent.²¹

Placement of the catheter was performed in the operating room under general anesthesia. With ultrasound guidance, a fluid pocket in the left upper quadrant was identified and cannulated with a 14-gauge needle through which a guide wire was advanced. The needle was removed, and an introducing sheath was advanced over the wire and the wire was removed. The catheter was tunneled subcutaneously from a site five millimeters superior to the sheath and introduced through it. The catheter was placed to gravity drainage and four to five liters of ascites were removed at time of placement (Figure 2). Patients were discharged to home on the day after placement and were followed post-operatively on a monthly basis.

The research was conducted under a protocol approved by the institutional review board and informed consent was obtained from each patient prior to catheter placement.

Discussion and Conclusion

The Pleurx catheter offers a number of potential advantages over traditional treatment modalities. In comparison to the peritoneovenous, peritoneocystic, and peritoneogastric shunts, placement of the Pleurx® catheter is a less complicated procedure, analogous to placement of an intra-peritoneal port, requiring no venous, cystic, or gastric access. While it was placed under general anesthesia in this series of cases, it potentially could be placed under local anesthesia or intravenous sedation. The catheter is routinely placed in the pleural space at bedside under local anesthesia. Since ascitic fluid is drained and discarded, the Pleurx avoids the complications of fluid overload and respiratory compromise. Since it is drained to atmospheric pressure, the Pleurx is not subject to the complication of failure due of pressure gradient between the peritoneal cavity and the central venous system or the bladder, as occurs with the peritoneovenous and peritoneocystic shunts. Drainage of ascites through the catheter may be performed at home by either a trained

family member or home health nurse. This is perhaps one of the catheter's greatest benefits, as it enables patients to eliminate repeated visits to the hospital and the pain and anxiety of repeated abdominal taps. All three patients studied expressed satisfaction with this aspect of catheter placement.

Clearly, larger study numbers are required to quantify the morbidity associated with the Pleurx catheter. In the Belfort study, one of 17 patients developed peritonitis. Risk of electrolyte imbalance is theoretically possible if too much ascites is removed at one time; however, this has not generally been observed in patients with cancer of gynecologic origin. A recently published report of a study concurrent with ours describes the outcome of 10 patients with end-stage abdominal carcinomatosis and intractable ascites from a variety of cancers, who were managed by placement of the Pleurx catheter. In the latter study, mean survival was 70 days and no catheter infections and no procedural complications occurred.²² Mechanical failure rates, cost of treatment, improvement of symptoms, and patient satisfaction also need to be measured in a larger study.

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