Original Article

Central Venous Catheter as Peritoneal Indwelling Catheter for the Management of Recurrent Malignant Ascites: A Case Series

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Abstract

Background: Malignant ascites is an accumulation of fluid in the peritoneal cavity due to the manifestation of terminal metastatic malignancies. Accumulation of ascitic fluid could cause abdominal distention, early satiety, and shortness of breath. The onset and progression of these symptoms are not only distressing but also cause deterioration of the quality of life. Malignant ascites is associated with poor prognosis with anticipated life expectancy ranging from 1 to 4 months. Therapeutic paracentesis is the mainstay of palliation for malignant ascites. It only provides a temporary relief of symptoms, ascites re-accumulates, and paracentesis has to be repeated. **Objectives:** The aim of this case series was to evaluate our experiences when treating malignant ascites with placement of central venous catheter in the peritoneal cavity, with special emphasis on patient satisfaction, comfort of caregiver, technical success, and adverse events. **Methods:** Five patients with advanced disease and recurrent malignant ascites who required multiple paracentesis were selected for placement of 7-FG triple-port Central venous catheter in the peritoneal cavity. Maximum fluids that can be tapped were removed in ward. Patients and their relatives were assessed for satisfaction with the procedure. **Results:** Out of 5 patients, 3 were female and 2 male (age between 46 and 62 years). Two patients had carcinoma gallbladder and one each of carcinoma ovary, breast, and prostate. All patients were followed up till 1 month from catheter placement. Patients and their relatives were well satisfied in terms of frequent hospital visit for paracentesis. **Conclusion:** In summary, we suggest that central venous catheter may be used as indwelling peritoneal catheter for the symptom management of recurrent malignant ascites. It provides a relatively safe and cost-effective alternative to serial large-volume paracentesis that requires multiple hospital admissions.

Keywords: Ascites, central venous catheters, paracentesis, quality of life, satisfaction scale

Introduction

Malignant ascites is an accumulation of fluid in the peritoneal cavity caused by peritoneal infiltration (50%), liver metastases (15%) causing secondary portal hypertension, lymphangitic carcinomatosis, lymphatic obstruction (20%), or a combination of these factors (15%).[1] Malignancies most commonly associated with ascites are gynecologic malignancies, especially ovarian cancer, gastrointestinal malignancies, breast cancer, and carcinoma of unknown primary.[2]

The recurrent accumulation of fluid can cause symptoms of abdominal distention, early satiety, and nausea. Patients often complain of shortness of breath, limited mobility, and lower extremity edema. In extreme cases, painful abdominal distension, vomiting, or intestinal obstruction due to bowel compression may occur. The onset and progression of these symptoms are not only distressing but also cause deterioration of the quality of life.[3] Malignant ascites is associated with poor prognosis with anticipated life expectancy ranging from 1 to 4 months.[4]

Treatment options available for malignant ascites include paracentesis, implantable peritoneal catheters, and peritoneovenous shunting. Drugs such as diuretics may be effective in some patients, particularly those with massive liver metastasis that causes portal hypertension. Therapeutic paracentesis is the mainstay of palliation for malignant ascites,[5] but it only provides a temporary relief of symptoms.

The aim of this case series was to evaluate our experience when treating malignant ascites with placement of central venous

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catheter in the peritoneal cavity, with special emphasis on patient satisfaction, comfort of caregiver, technical success, and adverse events.

Methods

Patients with terminal disease and recurrent malignant ascites who required multiple paracentesis were selected for placement of 7-FG triple-port central venous catheter in peritoneal cavity. After taking consent from patient and relative, the puncture site was located by ultrasound (curvilinear probe with frequency of 2–5 MHz). About 5–10 ml of 2% lignocaine was used for local anesthesia. Central venous catheter was placed in peritoneal cavity using Seldinger technique under ultrasound guidance [Figure 1]. All ports were checked by syringe aspiration; a collecting bag was connected with distal port, and details of using all ports and all kinds of connection were demonstrated and taught to patients' relative [Figure 2]. Maximum fluids that can be tapped were removed in ward. After complete satisfaction of patients and their relatives, a patient was discharged from the ward with exchange of contact details for future telephonic conversation. The primary caregiver was instructed to remove fluid when a patient had some symptoms due to fluid accumulation. It was also instructed not to remove more than 1 l of fluid in two consecutive days because fluid removal was done at home by a caregiver without supervision of any medical health-care professional.

Observation

Out of 5 patients, 3 were female and 2 were male (age between 46 and 62 years). Two patients were of carcinoma gallbladder and one each of carcinoma ovary, breast, and prostate. All patients were followed up till 1 month from catheter placement [Table 1]. There were no procedure-related complications during catheter insertion, and there were no major complications during follow-up. There was puncture site leak in one patient of carcinoma ovary on the 20th day of catheter insertion for which then the patient was called in the hospital and central venous catheter was removed. Catheter was functioning in all patients up to day 30 of placement. The patient and their relatives were well satisfied in terms of frequent hospital visit for paracentesis.

Discussion

There are multiple management options available such as diuretics, paracentesis, and implantable peritoneovenous shunting, but paracentesis is the mainstay for the symptom management of recurrent malignant ascites.[5] Case series suggest that approximately 90% of patients will respond symptomatically to paracentesis, with as little as a few liters of

Figure 1: Placement of guide wire using Seldinger technique

Figure 2: Central venous catheter placed in peritoneal cavity

Table 1: Details of cases

Age (years)/sex	Diagnosis	ECOG	Treatment status	Fixation of catheter (cm)	Tapped fluid volume (l)	Any complication
48/female	Carcinoma ovary	2	Received CT and no further CT advice	7	4	Catheter site leak on the 20th day
55/male	Carcinoma gallbladder	3	No further treatment advice	8	3	Nil
62/female	Carcinoma breast	3	Postsurgery, post RT and CT	10	2.5	Nil
46/female	Carcinoma gallbladder	3	Received CT and no further CT advice	8	3	Nil
57/male	Carcinoma prostate	4	Poor general condition not suitable for CT	7	2	Died on the 8th day

CT: Computed tomography, RT: Radiotherapy, ECOG: Eastern Cooperative Oncology Group

fluid removed.[6,7] However, the effect of paracentesis is short lived and has to be repeated.[8] Repeated abdominal paracentesis requires frequent hospital trip; frequency should be guided by the patient's symptoms (distension of abdomen, pain, shortness of breath, and early satiety). Furthermore, repeated large volume paracentesis associated with multiple complications such as pain due to multiple needle puncture, hypotension, infection, intestinal perforation, hypoproteinemia, secondary peritonitis, fatigue, dizziness, and nausea contributes to the patient's dissatisfaction.[9] Patients often delay their hospital visit due to discomfort caused by procedure and wait till they experience a high level of pain and abdominal distension before scheduling their next visit.[10] Frequent hospital visits not only affect the quality of life of the patient but also it increases the burden on their caregivers. To overcome the drawback of multiple paracentesis, indwelling peritoneal drainage catheter was considered to be the first choice. Few studies reported the successful use of many different catheters for refractory ascites.[11-13]

In this case series, central venous catheter set for Seldinger technique was used for abdominal paracentesis. Few studies testified its safety, feasibility, and effectiveness in malignant ascites.[14-16] The central venous catheter has lots of advantages over other indwelling catheter such as simple technique of placement, whereas other methods are more invasive and may require operating room for placement.[17] Immediate complication, such as perforation and bleeding, was less. Catheter-induced peritonitis can also be reduced by placement of short length of catheter into the peritoneal cavity.[18,19] Because of reduced flow rate with central venous catheter, the chances of paracentesis-induced circulatory dysfunction were also reduced.[20] Further flow rate can also be controlled by the interposition of three-way stopcock and governor between catheter hub and tube of collection bag. This was found to be simple and easy to manage by family members at home. The most commonly reported adverse event was catheter blockage which was resolved by simple flushing of the device. Other complications included pain and leakage around the catheter insertion site, which usually resolved spontaneously and did not require any intervention.[21,22] One of our patients had catheter insertion site leak on the 20th days of placement, the patient called to attend the outpatient department, and the catheter was removed. Peritonitis rarely occurred in malignant ascites patient. Rosenberg *et al*. and Courtney *et al*. reported one case of peritonitis, respectively, in their study.[10,21] Many other authors reported no case of peritonitis in their studies.[8,15,16,22]

Conclusion

We suggest that central venous catheter may be used as indwelling peritoneal catheter for the symptom management of recurrent malignant ascites in advance cancer cases. It provides a relatively safe and cost-effective alternative to serial large-volume paracentesis that requires multiple hospital visits. Central venous catheter has high rates of patency and low rates of infection. In addition, the operation of central venous catheter is simple and easy to drain ascites fluid at home and obviates the need for patients and caregivers to make frequent hospital visit for repeated procedure.

Patient selection remains the mainstay for successful management, and in patients with malignant ascites and short expected survival, this technique seems to be effective.

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Conflicts of interest

There are no conflicts of interest.

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