Palliative Interventional Radiology in the Abdomen, Part 2: Nutritional Support and Comfort Measures

- Nutritional support, administered after the placement of a gastrostomy tube, a gastrojejunostomy tube, or a jejunostomy tube can prevent aspiration and prolong life.
- Drainage from a gastrostomy tube can provide symptomatic relief from nausea and vomiting in patients with bowel obstruction.
- Tunneled peritoneal drainage catheters can relieve symptoms of dyspnea and bloating in patients with recurrent ascites.
- Cholecystostomy tubes control local symptoms and the inflammatory response in patients with cholecystitis who are not candidates for surgery.
- Biliary diversion can relieve symptoms of jaundice and improve liver function.
- Urinary diversion can improve renal function in cases of ureteral obstruction, and can treat incontinence and prevent urinary tract infections in those with urinary fistulas.

Figure 1. Percutaneous tubes for feeding in two separate patients. (A) Fluoroscopic image with contrast injection shows a gastrostomy tube (arrows) with tip in the region of fundus. (B) Fluoroscopic image shows a gastrojejunostomy tube (white arrow) with tip beyond the duodenojejunal flexure (black arrow).

Patients with advanced disease can experience a number of troubling symptoms that can be ameliorated through interventional radiology. These symptoms include difficulty swallowing, which can occur in patients with advanced cancer, especially in those with cancers of the head and neck. Dysphagia can also occur with the progression of neuromuscular disorders, such as amyotrophic lateral sclerosis (ALS), or in advanced dementia. In patients with advanced tumors, those with symptoms from obstruction may benefit from decompression. For example, gastric outlet obstruction causes symptoms such as nausea and vomiting, discomfort, or bloating. Patients with advanced malignancies of the pelvic organs can develop fistulae, which can result in urinary incontinence.
In the second article in this three-part series on palliative interventional radiology, we will describe some palliative interventional radiology treatments for nutritional support, drainage, and diversion (Table 1). The decision to initiate any of these palliative measures should be based on a determination of individual patient outcome, treatment goals, and patient/family preferences.

### Nutritional Support

Feeding tubes are used to provide nutrition in those who have difficulty swallowing because of obstructive cancer, head trauma, ALS, and advanced dementia. Nasogastric tubes are only suitable for short-term use because they can cause scarring that prevents the laryngeal inlet from closing, which increase the risk of aspiration. In addition, patient intolerance and the practical difficulty of using nasogastric tubes in an outpatient setting limit the use of nasogastric tubes. For longer term feeding, placement of a gastrostomy or gastrojejunostomy tube is preferable. However, the indications for nutritional support are controversial and there are no definitive studies on the benefits, especially for demented patients who may need to be restrained. Nevertheless, there are reports that nutritional support prevents aspiration of food, maintains skin integrity and prevents the development of pressure sores.

Gastrostomy tubes can be placed with the aid of endoscopy, with fluoroscopic guidance, or by surgical means (Figure 1A). The fluoroscopic guidance method is performed under conscious sedation and local anesthesia. Before the procedure begins, a nasogastric tube is placed, which is used to distend the stomach, and barium is administered overnight to opacify the colon. Using ultrasound to demarcate the liver, a radiologist selects the sites for T-tack insertion in the stomach wall and inserts the tacks via a guidewire. After insertion, the T-tacks are used to draw the stomach close to the abdominal wall and the gastrostomy tube is placed at the center of the T-tacks. Contrast material is then injected to confirm the placement of the gastrostomy tube. It is recommended that use of the gastrostomy tube be delayed for 24 hours after the procedure.

The same procedure can be used to place a gastrojejunostomy tube by simply advancing the tube into the jejunum (Figure 1B). This placement has the advantages of reducing gastric reflux as well as reducing the incidence of aspiration pneumonia and is especially useful in younger patients with head trauma or acute cerebrovascular accident.
Figure 2. Coil embolization of ureters and nephrostomy catheter placement in 67 year-old woman with a vesicovaginal fistula due to advanced cervical cancer. (A) Initial nephrostomy catheter placement followed by antegrade nephogram shows a vesicovaginal fistula (arrow). (B) Stainless steel coil placement in the mid- and proximal ureter via the nephrostomy access. (C) Post procedure image shows the coils (white arrows) and the nephrostomy drainage catheters in place (black arrow). No fistulous leak was found.

Direct jejunostomy tube placement is useful for patients whose stomach is not accessible due to prior gastric or esophageal surgery, prior gastrectomy, or for patients with a small bowel obstruction. Jejunostomy tubes can be placed under fluoroscopic or CT guidance although the surgical approach is more commonly used. The interventional radiology technique is similar to gastrostomy tube placement except that the T-tacks are placed in the jejunum and the feeding tube enters the jejunum directly.

Drainage and Decompression Procedures
Gastrostomy tubes can also improve symptoms resulting from small bowel obstruction, which is a common problem in patients with advanced malignancies, causing chronic nausea, vomiting, abdominal pain, and dehydration. Management of these symptoms is often complicated by the presence of ascites, prior radiation therapy, and multiple prior laparotomies. In these patients, placement of a gastrostomy tube for the purposes of decompression results in significant relief of symptoms and improvement in quality of life.

Ascites is a common problem of advanced cancers, causing pain, dyspnea, anorexia, and dysphoria. Ascites taps can often alleviate these symptoms. Alternatively, interventional radiologists can implant a tunneled peritoneal drainage catheter, a procedure that is recommended for patients who wish to avoid repeated ascites taps and who have a short life expectancy. The procedure is carried out under conscious sedation and local anesthesia. After first determining a site of ascites accumulation in the peritoneal cavity by sonography, generally in a lateral portion of the abdomen, a guidewire is placed into that site. Next, a subcutaneous tunnel is formed towards the patient’s midline, which will serve as an anchor for the catheter. After dilation of the access site, the catheter is placed through the subcutaneous tunnel and into the peritoneum. Drainage of ascites fluid via this catheter can be performed at home with help from a visiting nurse, thus avoiding multiple hospital visits.

Biliary Decompression Procedures
Cholecystitis is a common problem and more than 900,000 cholecystectomies are performed each year in the USA. If comorbidities contraindicate cholecystectomy and patients are treated medically, there is a high risk of re-admission due to recurrent cholecystitis or gallstone related diseases such as pancreatitis. In patients who are not candidates for surgery, cholecystostomy is an effective palliative treatment. The procedure can be performed at the
Patient’s bedside with minimal complications and is suitable for patients with calculus or acalculus cholecystitis. Under sonographic guidance, a cholecystostomy tube is placed into the gallbladder, using a trocar technique and transhepatic access. Drainage via this the tube controls local symptoms and systemic inflammatory response. Cholecystostomy placement does not contraindicate subsequent cholecystectomy if the patient’s condition improves.

Patients with late stage biliary cancer, pancreatic cancer, or a metastasis to the bile duct present with progressive jaundice and constitutional symptoms. Percutaneous transhepatic biliary drainage is an effective palliative treatment for these patients, providing symptomatic relief, improved quality of life, and may allow chemotherapy by improving liver function. In this procedure, ultrasound is used to guide the initial placement of an internal-external drainage catheter into a distal bile duct. In order to allow internal drainage, a self-expanding metal stent may be placed later.

**Urinary Diversion**

Patients with late-stage pelvic malignancies, including those with prostate, colon, ovary, and bladder cancers can develop ureteric obstructions, causing uremia. In other patients, malignancies can lead to the development of urinary fistulae and subsequent urinary incontinence.

In both cases, placement of a urinary diversion catheter, which is performed with local anesthesia and conscious sedation under ultrasound and fluoroscopic guidance, can improve symptoms. In those with obstruction, the treatment can improve renal function, quality of life, and survival (Figure 2). In cases of urinary fistulae, the treatment reduces the likelihood of urinary tract infections and relieves the psychological distress of incontinence.

**Scheduling**

Appointments for palliative interventional radiology therapies for nutritional support and comfort measure described here can be scheduled by calling 617-726-8396. The Abdominal Interventionsal Procedures Request Form is available on the Mass General Imaging Intranet.

Interventional radiology procedures are performed at the main campus only.

**Further Information**

For more information about palliative interventional radiology, please contact Avinash Kambadakone, MD, Abdominal Imaging and Intervention, Department of Radiology, Mass General Hospital, at 617-643-6315.

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**References**

