

VIDEOS IN CLINICAL MEDICINE
SUMMARY POINTS

Gastrostomy-Tube Exchange

Jeremy Juern, M.D., and Amy Verhaalen, R.N., M.S.N.

The following text summarizes information provided in the video.

OVERVIEW

A gastrostomy tube, or “G-tube,” provides access for long-term enteral nutrition in patients who are unable to eat. Gastrostomy tubes may be required in patients with cancer, stroke, traumatic brain injury, or other conditions.

INDICATIONS

A gastrostomy tube may need to be reinserted after accidental dislodgement, or it may be need to be removed and replaced because of a malfunction, such as tubing that is cracked or a balloon that no longer works. Gastrostomy tubes may be changed on a schedule to prevent malfunction. The longevity of gastrostomy-tube balloons is variable and depends on a number of factors (e.g., the manufacturer, stomach acidity, and the volume of water in the balloon). One study reported a median longevity of 6 months.¹

CONTRAINDICATIONS

Contraindications to gastrostomy-tube exchange include the lack of proper equipment, the absence of continued need for a gastrostomy tube, and placement of the tube within the previous 6 weeks. Studies in animals have shown that a gastrocutaneous tract forms within 1 to 3 weeks, but in a malnourished patient more time would be required; thus, leaving the tube in place for approximately 6 weeks is appropriate.^{2,3}

ANATOMY AND GASTROSTOMY-TUBE IDENTIFICATION

A gastrostomy tube is inserted through the skin into the stomach. There are different types of tubes. Some gastrostomy tubes are fitted with a deformable plastic mushroom. This type of tube is placed by means of the percutaneous endoscopic gastrostomy (PEG) technique. This video describes the use of the balloon-tipped tube, which has a valve port that is used to insert water into the balloon. The standard PEG tube is fitted with a mushroom tip and does not have such a port (Fig. 1).

PREPARATION

The patient’s enteral nutrition does not need to be restricted or discontinued before the gastrostomy tube is changed. In preparation for the procedure, the patient should be in a supine position. The head of the bed may be raised 30 degrees if that angle makes the patient more comfortable. The tube that is already in place should be inspected; note the French diameter of the tube and the volume capacity of the balloon. Also note how deeply the tube has been inserted at the surface of the skin and at the top of the external bumper (in centimeters). Sometimes, all markings on the tube may have worn off.

From the Medical College of Wisconsin, Milwaukee. Address reprint requests to Dr. Juern at the Division of Trauma and Critical Care, Department of Surgery, Medical College of Wisconsin, 9200 W. Wisconsin Ave., Milwaukee, WI 53226, or at jjuern@mcw.edu.

N Engl J Med 2014;370:e28.

DOI: 10.1056/NEJMvcm1207131

Copyright © 2014 Massachusetts Medical Society.

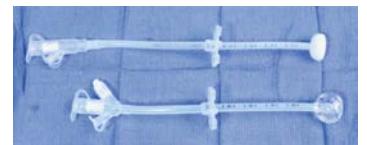


Figure 1. Two Types of Gastrostomy Tubes.

The upper tube shown is a mushroom-tipped percutaneous endoscopic gastrostomy (PEG) tube with a deformable plastic mushroom tip; it does not have a balloon tip or a valve port. The lower tube is a gastrostomy tube with a balloon tip that is filled with water. The valve port on the proximal end of this tube is used to fill the balloon.

EQUIPMENT

The equipment needed should be gathered before the procedure is started. Have the following equipment at hand: a replacement gastrostomy tube with the same French diameter as the tube that is being removed, a water-based gel lubricant, a 10-ml syringe filled with water, a 60-ml catheter-tipped syringe, and clean gloves.



Figure 2. Insertion of New Gastrostomy Tube.

After removal of the old gastrostomy tube, the new tube is inserted and the balloon is inflated with water (not shown).



Figure 3. Confirmation of Intra-gastric Placement.

Correct placement of the gastrostomy tube can be confirmed through aspiration of gastric contents.



Figure 4. Frontal Radiograph of the Abdomen, with False Impression of Correct Tube Placement.

This radiograph gives the impression of correct placement, but the gastrostomy tube has actually been placed in a subcutaneous tract. To confirm proper placement of a gastrostomy tube radiographically, an oblique view must be obtained with the use of fluoroscopy. This patient's spinal-stabilization hardware are incidental to the condition illustrated.

TESTING THE TUBE

Before using the new tube, test the balloon. First note the amount of water needed to fill it. Fill the balloon with its maximum volume of water and look for any sign of leakage. If there is no leakage, remove all the water from the balloon. Lubricate the tip of the tube. Ensure that the external bumper can be moved down the tube. During storage, the bumper often becomes stuck to the tube; moving the bumper at this point will be much easier than moving it after you have inserted the tube through the gastrostomy-tube site.

PROCEDURE

Use an empty syringe to aspirate the water from the balloon port of the existing tube. Reaspirate, if necessary, to make sure that all the water has been removed. Have a gauze pad ready to absorb any drainage, and then remove the tube. Gently insert the new tube until it is a few centimeters past the centimeter mark for skin level noted on the previous tube (Fig. 2). This step is recommended to ensure that the balloon will be inflated when it is in the stomach, not in the gastrocutaneous tract. When the balloon tip is well into the stomach, inflate the balloon with water. Gently pull up on the tube until you feel slight resistance from the inflated balloon against the inner gastric wall, then push the external bumper down, but not too tightly. Note that the patient should not feel pain when the balloon is filled with water; if the patient does feel pain, the tube may have been placed in a false passage instead of in the stomach.

It should be easy to spin the tube, and there should be a gap of approximately 2 to 3 mm between the skin and the bumper. If the outer flange is too tight, it may cause necrosis of the gastric mucosa. The centimeter marker at the top of the external bumper should be set to the same measure at which the marker on the old tube was set (assuming that the previous tube was not set too tightly and that the balloon was fully inflated.)

Confirm intra-gastric placement by aspirating gastric contents (Fig. 3). Aspiration indicates that the tube is ready for use. If you placed the new tube without difficulty but are unable to aspirate gastric contents, connect the new tube to a drainage bag and allow drainage to occur through gravitational flow. If gastric contents appear in the bag within 20 minutes, intra-gastric placement can be considered confirmed. If no gastric contents appear in the bag in 20 minutes, intra-gastric placement should be confirmed on fluoroscopy after the administration of water-soluble contrast material. An oblique view should be obtained.

COMPLICATIONS

The most serious complication of gastrostomy-tube exchange is the placement of the tip of the tube in a false passage within the subcutaneous tissue or in an intra-peritoneal location rather than in the stomach. The administration of nutrition through a tube that is not in the stomach can be fatal. An abdominal radiograph, obtained after the administration of contrast material with the patient in the supine position, is often used to visualize the placement of nasogastric tubes, but this approach is not a reliable means of confirming intra-gastric placement. The radiograph shown in Figure 4 gives the impression of correct placement, but an oblique

view of the same patient, obtained with the use of fluoroscopy after the administration of contrast material, would reveal that the contrast material is actually flowing into the stomach through a subcutaneous tract. The tube shown in Figure 4 was later repositioned for placement in the stomach with the use of a guidewire and fluoroscopy.

SUMMARY

It is important for clinicians to be comfortable performing gastrostomy-tube exchange. Understanding the procedure and its potential hazards should help to minimize the risk of complications.

REFERENCES

1. Michaud L, Guimber D, Blain-Stregloff AS, Ganga-Zandzou S, Gottrand F, Turck D. Longevity of balloon-stabilized skin-level gastrostomy device. *J Pediatr Gastroenterol Nutr* 2004;38:426-9.
2. Mellinger JD, Simon IB, Schlechter B, Lash RH, Ponsky JL. Tract formation following percutaneous endoscopic gastrostomy in an animal model. *Surg Endosc* 1991;5:189-91.
3. Maxwell CI, Hilden K, Glasgow RE, Ollerenshaw J, Carlisle JG, Fang JC. Evaluation of gastropexy and stoma tract maturation using a novel introducer kit for percutaneous gastrostomy in a porcine model. *JPEN J Parenter Enteral Nutr* 2011; 35:630-5.

Copyright © 2014 Massachusetts Medical Society.