

# Endoscopic Ultrasound– Guided Gastrojejunostomy



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## KEYWORDS

- Endoscopic ultrasonography • Gastrojejunostomy • Anastomosis
- Gastric outlet obstruction • Lumen-apposing metal stent

## KEY POINTS

- EUS-guided gastrojejunostomy is an emerging modality for the treatment of gastric outlet obstruction.
- Provided patients are chosen carefully and anatomy is favorable, clinical success rates are 90% in the hands of an expert endoscopist.
- A one-step procedure using a cautery-tipped lumen-apposing metal stent (LAMS) results in higher technical success and shorter procedure times by obviating multiple long wire exchanges.
- Although early retrospective data compare favorably with enteral stenting and surgical gastrojejunostomy, prospective studies are needed before recommending EUS-GJ as the standard of care for benign or malignant gastric outlet obstruction.



Video content accompanies this article at <http://www.giendo.theclinics.com>.

## INTRODUCTION: NATURE OF THE PROBLEM

Gastric outlet obstruction (GOO) is a common complication of advanced upper gastrointestinal and pancreatic malignancies. Surgical gastrojejunostomy is currently the standard of care for palliative treatment; however, limitations include prolonged recovery times delaying chemotherapy, delayed gastric emptying/gastroparesis, and the costs associated with operating room time. Enteral stenting is a less durable option for patients with a life expectancy less than 2 months, but, beyond this time-frame, such complications as stent migration or stent occlusion are common.<sup>1</sup> More recently, endoscopic ultrasound (EUS)-guided gastrojejunostomy or gastroenterostomy (EUS-GJ, EUS-GE) with placement of a biflanged lumen-apposing metal stent

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(LAMS) has emerged as a third option that may provide long-term luminal patency without the surgical limitations described previously. Provided candidates are chosen appropriately, early data suggest good outcomes with acceptable complication rates. This article discusses the indications, techniques, complications, postoperative care, and early outcomes for this emerging procedure.

## INDICATIONS/CONTRAINDICATIONS

Several requirements must be met before consideration of an EUS-GJ (**Table 1**). First, a target area of duodenal or jejunal lumen must be located by EUS within 2 cm of the gastric wall. Any distance longer than 2 cm may result in incomplete apposition of the lumens by the metal stent. Second, one must be cognizant of the possibility of malignant invasion into the wall of the stomach. Direct puncture through tumor may result in an increased risk of complications, such as bleeding and incomplete apposition. Third, because a dilating balloon is often passed distally through the duodenum to locate an appropriate area of jejunum to target for distal site of anastomosis, severe outlet obstruction resulting in the inability to advance a wire to the jejunum may render the procedure not feasible. Fourth, the endoscopist must be able to maintain access to the free floating jejunum after initial EUS-guided puncture. Multiple exchanges over the wire make this component more challenging, and thus the one-step cautery-assisted stent deployment method is preferred (discussed later). Ascites also hinder attempts at maintaining access to the jejunum. Fifth, an appropriate lumen-apposing stent must be available with the ability to hold the two lumens together and maintain patency. A standard covered metal stent may not be appropriate. Finally, care must be taken to ensure that no downstream luminal obstruction exists distal to the jejunum puncture site. In this setting, which may occur in the setting of peritoneal carcinomatosis or extensive lymphadenopathy, the procedure does not provide symptomatic relief.

## TECHNIQUE/PROCEDURE

To date, four primary techniques have been described to create a EUS-GJ: (1) water immersion,<sup>2</sup> (2) water-inflated balloon technique,<sup>3,4</sup> (3) endoscopic ultrasonographically guided double-balloon-occluded GJ bypass (EPASS),<sup>5</sup> and (4) the free-hand technique.<sup>4,6</sup> Although slightly different with regards to method of locating the jejunal loop before EUS-guided transgastric puncture, all four methods require a therapeutic linear echoendoscope and use a biflanged LAMS to ultimately create the GJ. Before

**Table 1**  
Indications and contraindications for EUS-GJ

Indications	Contraindications
Malignant obstruction in the gastric antrum or first, second, or third parts of duodenum	Malignant obstruction downstream of jejunal puncture site
	Target puncture site >2 cm from gastric wall
	Malignant invasion through wall of stomach (relative)
	Ascites (relative)
	Inability to pass wire through obstruction (unless using free-hand technique)

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