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# GASTROJEJUNOSTOMY GUIDED BY ENDOSCOPIC ULTRASONOGRAPHY: REPORT OF TWO CASES

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## ABSTRACT

We present two cases of gastric outlet obstruction (GOO)—one secondary to chronic pancreatitis and the other to malignant duodenal infiltration—successfully managed with endoscopic ultrasound-guided gastrojejunostomy (EUS-GJ). Both procedures were performed using a direct technique with lumen-apposing metal stents (LAMS), achieving immediate symptom relief and no procedural complications. The first case involved a 40-year-old male with severe inflammatory GOO and portomesenteric thrombosis, while the second case was a 72-year-old female with locally advanced gallbladder carcinoma causing duodenal obstruction. Technical nuances included fluoroscopic confirmation, methylene blue-assisted loop distention, and post-deployment contrast patency testing. EUS-GJ offers a minimally invasive alternative to surgical bypass or enteral stenting, particularly in high-risk patients with benign or malignant etiologies. This report highlights its efficacy, safety, and advantages, such as shorter hospital stays (6-day discharge in Case 1) and avoidance of tumor ingrowth. We discuss indications (e.g., non-resectable disease, comorbidities), contraindications (e.g., proximal jejunal obstruction), and potential adverse events (stent misplacement, leakage). EUS-GJ emerges as a transformative approach for GOO palliation, combining endoscopic and ultrasonographic precision to optimize outcomes.

**KEYWORDS:** Endoscopic ultrasound; gastrojejunostomy; gastric outlet obstruction; LAMS; palliative treatment.

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# GASTROYEYUNOSTOMÍA GUIADA POR ULTRASONIDO ENDOSCÓPICO: REPORTE DE DOS CASOS

## RESUMEN

Presentamos dos casos de obstrucción de la salida gástrica (OSG)—uno secundario a pancreatitis crónica y otro a infiltración duodenal maligna—manejados exitosamente con gastroyeyunostomía guiada por ultrasonido endoscópico (EUS-GJ). Ambos procedimientos se realizaron mediante técnica directa con stents metálicos de aproximación luminal (LAMS), logrando alivio sintomático inmediato y sin complicaciones. El primer caso fue un hombre de 40 años con OSG inflamatoria severa y trombosis portomesentérica, mientras que el segundo correspondió a una mujer de 72 años con carcinoma avanzado de vesícula biliar causando obstrucción duodenal. Los detalles técnicos incluyeron confirmación fluoroscópica, distensión del asa con azul de metileno y pruebas de permeabilidad con contraste post-implantación. La EUS-GJ representa una alternativa mínimamente invasiva al bypass quirúrgico o stents entéricos, especialmente en pacientes de alto riesgo con etiologías benignas o malignas. Este reporte resalta su eficacia, seguridad y ventajas, como estancias hospitalarias más cortas (alta a los 6 días en el Caso 1) y evitar el crecimiento tumoral intraluminal. Discutimos indicaciones (ej. enfermedad no resecable, comorbilidades), contraindicaciones (ej. obstrucción yeyunal proximal) y eventos adversos potenciales (malposición del stent, fuga). La EUS-GJ surge como un enfoque

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transformador para la paliación de la OSG, combinando la precisión endoscópica y ecográfica para optimizar resultados.

**PALABRAS CLAVE:** Ultrasonido endoscópico; gastroyeyunostomía; obstrucción de la salida gástrica; LAMS; tratamiento paliativo.

## INTRODUCTION

Gastric outlet obstruction (GOO) is a syndrome characterized by vomiting and epigastric pain secondary to mechanical obstruction, which may arise from benign (chronic pancreatitis, peptic ulcer disease) or malignant causes (gastric/duodenal cancer, biliopancreatic neoplasms). Endoscopic ultrasound-guided gastrojejunostomy (EUS-GJ) has emerged as a viable alternative to surgical and conventional endoscopic management (1,2). Here, we report two clinical cases of EUS-GJ performed at our institution.

## Case Reports

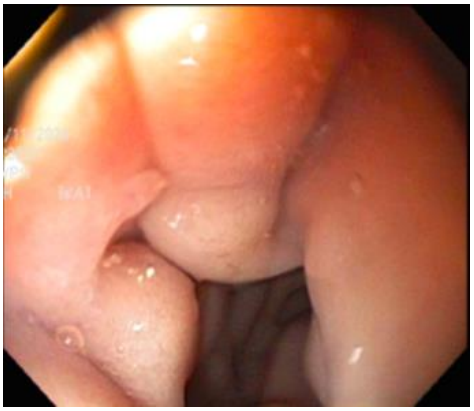
Two cases of GOO—one benign and one malignant—are presented.

**Case 1:** A 40-year-old male with a history of severe acute pancreatitis two years prior (80% pancreatic necrosis, unknown etiology) developed pancreatic collections requiring percutaneous and transgastric drainage with necrosectomy. Subsequent hospitalizations occurred due to GOO and biliary obstruction secondary to pancreatic inflammation. Management

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included nasojejunal enteral nutrition and endoscopic biliary plastic stenting. He later presented with oral intolerance and generalized abdominal pain.

**Figure 1.** Endoscopic view showing pyloric stenosis.



Upper endoscopy confirmed moderate pyloric stenosis (Figure 1). Endoscopic retrograde cholangiopancreatography (ERCP) for biliary stent exchange revealed GOO with severe inflammatory involvement of the prepyloric region, pylorus, duodenal bulb, and benign-appearing distal common bile duct stenosis. Double plastic biliary stents were placed.

Hospitalization revealed portosplenomesenteric thrombosis with cavernous transformation of the portal vein, portosystemic collateral circulation, presinusoidal portal hypertension, ascites, and splenomegaly. Due to comorbidities,

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hepatobiliary surgery and gastroenterology teams deemed EUS-GJ beneficial. The procedure was performed under endoscopic ultrasound and fluoroscopic guidance. Saline (3 L) mixed with contrast (200 mL) and methylene blue was infused to distend the intestinal loop. A jagwire guidewire was advanced, and a lumen-apposing metal stent (LAMS) was deployed without complications. Contrast confirmed anastomosis patency. Liquid diet was initiated at 48 hours, and the patient was discharged on day 6 without complications.

**Case 2:** A 72-year-old female with hypertension presented with two months of subjective weight loss and recurrent emesis. External MR cholangiography revealed a 40 mm infiltrative tumor replacing the gallbladder (suggestive of carcinoma), extending to the duodenal wall, causing stenosis and gastric dilation. Upper endoscopy showed malignant-appearing duodenal stenosis (100% circumferential involvement, 80% lumen reduction), preventing passage to the second duodenal portion.

Given locally advanced disease, surgical resection was deemed non-beneficial. EUS-GJ was performed: a jagwire guidewire and pigtail catheter were advanced, followed by balloon dilation (10–12 mm). Nasojejunal tube placement was confirmed with contrast. Endoscopic ultrasound-guided saline/methylene blue infusion distended the proximal jejunal loop, and LAMS deployment was successful. Contrast confirmed anastomosis integrity.

Informed consent was obtained for case publication. The Institutional Ethics Committee of Hospital Alma Mater, Universidad de Antioquia, approved the study protocol.

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## Discussion

EUS-GJ has gained prominence as a minimally invasive management option for GOO, whether benign or malignant, particularly in high-risk patients with poor quality of life. It serves as palliative therapy or an alternative for non-surgical candidates (3).

First described in animal models by Fritscher-Ravens et al. (2002) and later by Binmoeller et al. (2012) using LAMS in pigs (1,4), EUS-GJ is indicated for patient's ineligible for surgery due to comorbidities or unresectable disease. Palliative options include surgical gastrojejunostomy or endoscopic duodenal stenting—the latter less invasive but prone to tumor ingrowth (2,4,5). Surgical management (open/laparoscopic) remains preferred for patients with longer life expectancy, despite higher mortality (6).

Endoscopic dilation for benign GOO yields variable results and requires multiple sessions, increasing perforation risk (7). EUS-GJ reduces surgical risk, procedure time, hospital stay, and adverse events (6), while bypassing obstruction and avoiding stent occlusion by tumor growth (7).

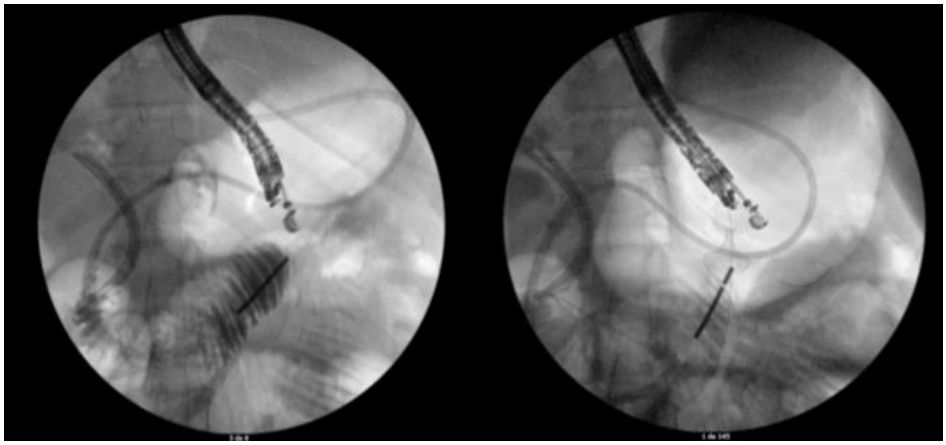
GOO results from gastric, duodenal, jejunal, or extraluminal obstruction, presenting with postprandial vomiting, abdominal pain/distension, and weight loss (2). EUS-GJ is considered for gastric (antropyloric), pancreatic, duodenal (D1–D3), cholangiocarcinoma, lymphoma, or metastatic disease, as well as benign causes (chronic pancreatitis, peptic stenosis) (4,6,8). Contraindications include gastric body, proximal jejunal (ligament of Treitz), or D4 obstruction, and severe ascites (4,8).

The technique creates a gastroduodenal/jejunal anastomosis via LAMS deployment under EUS guidance (2,9). Approaches include direct, balloon-assisted, or double-balloon occluded bypass (6), with direct being preferred for efficiency (7).

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In our cases, direct EUS-GJ was performed using saline/methylene blue to distend the target loop, confirmed by aspiration before LAMS placement. Fluoroscopy and EUS localized the intestine, followed by puncture, guidewire insertion, and LAMS deployment with electrocautery enhancement (Figure 2).

**Figure 2.** The endoscope is maintained in a fixed position while inserting a lumen-apposing metal stent (LAMS) through the stomach into the small intestine, thereby creating the anastomosis.



Challenges include identifying the optimal intestinal loop for anastomosis, as misalignment may preclude puncture (2). Technical and clinical success rates reach 90%, with 6.8% adverse events (7). Complications include stent misplacement, perforation, bleeding, infection, leakage, or tumor ingrowth (1,3). Stent displacement is the most common adverse event, requiring endoscopic revision.

This technique is a recent, safe, and effective minimally invasive alternative

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to enteral stenting or surgical anastomosis (10).

**Conflict of Interest:** The authors have no conflicts of interest to declare

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Daniela Giraldo-Campillo, Karen Reyes Romero, Juan Camilo Ricaurte Ciro, Mateo Zuluaga-Gomez and Carlos M. Ardila: Conceptualization

Daniela Giraldo-Campillo, Karen Reyes Romero, Juan Camilo Ricaurte Ciro, Mateo Zuluaga-Gomez and Carlos M. Ardila: Methodology

Daniela Giraldo-Campillo, Karen Reyes Romero, Juan Camilo Ricaurte Ciro, Mateo Zuluaga-Gomez and Carlos M. Ardila: Data curation

Daniela Giraldo-Campillo and Carlos M. Ardila: Writing- Original draft preparation.

Daniela Giraldo-Campillo, Karen Reyes Romero, Juan Camilo Ricaurte Ciro, Mateo Zuluaga-Gomez and Carlos M. Ardila: Visualization

Daniela Giraldo-Campillo, Karen Reyes Romero, Juan Camilo Ricaurte Ciro, Mateo Zuluaga-Gomez and Carlos M. Ardila: Investigation.

Daniela Giraldo-Campillo, Karen Reyes Romero, Juan Camilo Ricaurte Ciro, Mateo Zuluaga-Gomez and Carlos M. Ardila: Validation and supervision.

Daniela Giraldo-Campillo, Karen Reyes Romero, Juan Camilo Ricaurte Ciro, Mateo Zuluaga-Gomez and Carlos M. Ardila: Writing- Reviewing and Editing.

**Ethics approval:** Informed consent was obtained for case publication. The Institutional Ethics Committee of

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