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EUS-Guided Versus Surgical Gastroenterostomy: Which Endures? The *ENDURO* trial

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This summary reviews This article reviews Bang JY, Puri R, Lakhtakia S, et al. Endoscopic or surgical gastroenterostomy for malignant gastric outlet obstruction: A randomised trial. Gut 2026;75:24-32.

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STRUCTURED ABSTRACT

Question: In patients with malignant gastric outlet obstruction, is endoscopic ultrasonography-guided gastroenterostomy (EUS-GE) compared with surgical gastroenterostomy (GE) associated with improved outcomes?

Design: Randomized controlled trial (RCT).

Setting: Twelve academic and teaching hospitals in the Netherlands. The study required that each hospital have experience in at least 20 lumen-apposing metal stents (LAMS) of any indication, at least 10 endoscopic gastroenterostomies, and competence approved by 2 experienced interventional endoscopists from the study steering committee.

Patients: Adult patients presenting with malignant gastric outlet obstruction (GOO) presenting with nausea, vomiting, or inability to eat, defined by the Gastric Outlet Obstruction Scoring System (GOOSS) score of 0 (no oral intake) or 1 (liquids only).

Interventions: Patients were randomly assigned 1:1 to endoscopic gastroenterostomy or surgical gastroenterostomy.

Outcomes: Primary outcomes included: 1) time to resumption of soft oral intake (GOOSS score of 2 or higher, without vomiting) and 2) non-inferiority in the rate of persistent or recurrent obstructive symptoms requiring reintervention. The outcome of first day of oral intake was assessed by patient diaries or phone calls from staff. Reintervention was defined as any endoscopic, surgical, or radiological intervention after the study procedure aimed to improve nutritional intake. Multiple secondary outcomes were also assessed including clinical success.

Data Analysis: Intention-to-treat analysis, time to oral intake was compared using a Cox proportional hazards model adjusted for WHO performance status. Patients were censored at the end of follow-up (6 months) or death. For the non-inferiority analysis, a maximum re-intervention risk difference of 20% was set because the study authors believed the expected benefits of endoscopic as opposed to surgical intervention would outweigh a possible difference in reintervention rate (i.e. less invasiveness, fewer adverse events).

Funding: KWF Dutch Cancer Society.

Results: Between February 2022-February 2024, 98 patients were assigned to endoscopic gastroenterostomy (n=48) or surgical gastroenterostomy (n=50). Mean age of the cohort was 69-70 years, over 50% of patients were male, and the predominant cancer type was pancreas cancer (comprising 58% of patients in the EUS-GE group and 50% of patients in the surgical GE group). The obstruction was localized to the proximal duodenum in most cases. Six-month follow-up was completed in 11 (23%) patients in the EUS-GE group and 12 (24%) patients in the surgical GE group. At the time of follow-up, 77% and 76% of patients had died in the EUS-GE and surgical groups, respectively.

In the EUS-GE group, patients were able to resume solid oral intake after a median of 1 day (interquartile range [IQR] 1-3) compared with 3 days (IQR 1-6) in the surgical GE group (hazard ratio [HR] 2.21; 95% CI 1.43-3.42; P=0.0003). Reintervention for persistent/recurrent obstructive symptoms was required in 5 (10%) patients after EUS-GE and in 6 (12%) patients after surgical GE (risk difference 1.6%; upper limit of 90% CI 8.9, which was consistent with non-inferiority)

Multiple secondary endpoints were evaluated. Clinical success, defined by tolerating soft solid foods without vomiting (GOOSS score ≥2) was achieved in 96% of the EUS-GE group vs 80% of the surgical GE group (relative risk [RR] 1.20 [95% CI 1.03-1.39]). Gastroenterostomy dysfunction occurred in 4% of the EUS-GE vs 10% of the surgical GE group (RR 0.42; 95% CI 0.09-2.02), and reintervention was required in 21% vs 28%, respectively (RR 0.74; 95% CI 0.37-1.51). Time to initiation of systemic therapy was similar between the 2 groups. Median length of hospital stay in the EUS-GE group was 1 day (IQR 1-3) vs 4 days (IQR 2-7) in the surgical GE group (risk difference 0.46; 95% CI 0.20-0.78). Median overall survival after EUS-GE vs surgical GE was 91 days (IQR 56-165) vs 74 days (IQR 29-157), respectively.

There was no difference in technical success, GE dysfunction, time to reintervention, 1-month weight change, or 30-day readmissions between the 2 groups. Quality of life, as measured by the European Organisation for Research and Treatment of Cancer Quality of Life Core Questionnaire (EORTC QLQ-C30), was similar in the first 3 months but was better in the surgical group than in the EUS-GE group at 6 months.

Adverse events occurred in 58% vs 64% in the EUS-GE vs surgical GE groups, respectively (RR 0.91; 95% CI 0.66-1.25). Serious adverse events occurred in 4 (8%) of patients in the EUS-GE group, which included surgical GE due to obstruction distal to the ligament of Treitz and due to LAMS maldeployment, ICU admission due to LAMS maldeployment and death due to pneumonia and clinical deterioration vs 6 (12%) in the surgical GE groups (including endoscopy for anastomosis assessment under general anesthesia, surgical gastrostomy due to persistent gastropareiss, ICU admission due to severe hypokalemia, and death due to major abdominal bleeding, clinical deterioration or pneumosepsis).

COMMENTARY

Why Is This Important?

This is one of the first RCTs comparing EUS-GE and surgical GE for the management of malignant GOO. Recently, another multi-center RCT conducted at 6 centers in the USA, Germany and India randomized 74 patients to EUS-GE or surgical GE.[1] This trial was similarly performed at expert centers requiring endoscopists to have experience of at least 20 EUS-GE procedures. GOOSS of 0 or 1 at the time of hospital discharge was achieved in 8% vs 39% among patients who underwent EUS-GE vs surgical GE,

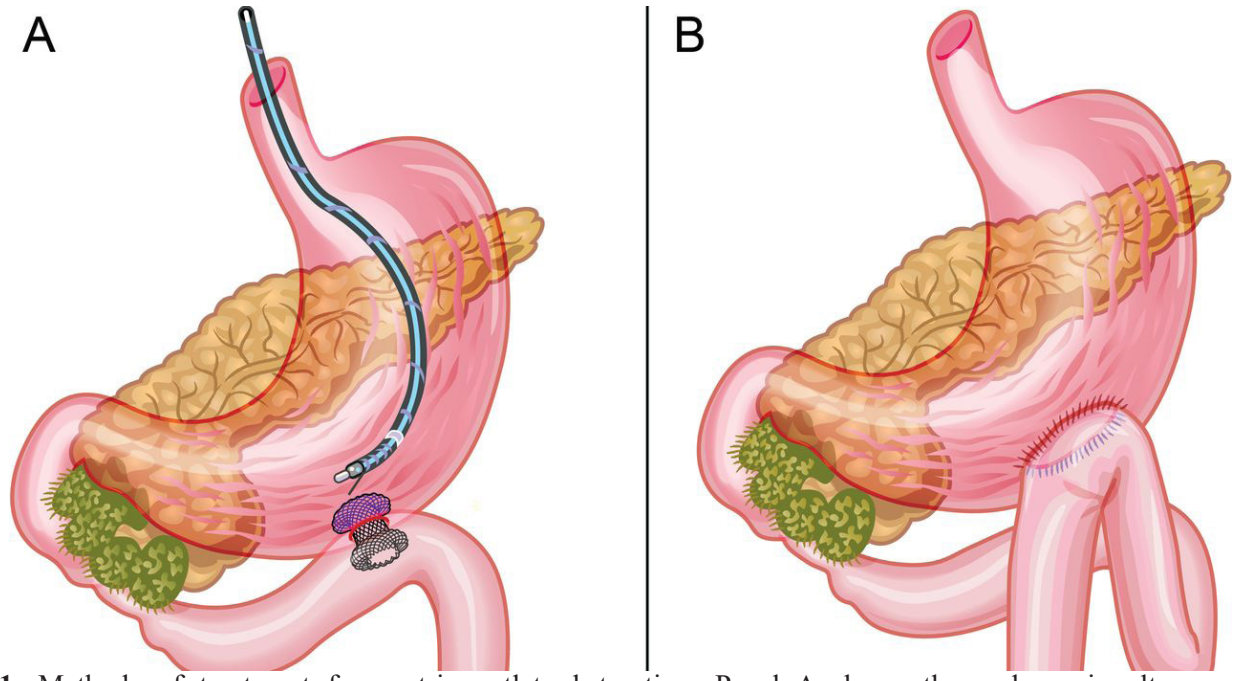

Figure 1. Methods of treatment for gastric outlet obstruction. Panel A shows the endoscopic ultrasound-guided gastroenterostomy approach, in which a lumen-apposing metal stent is placed into the jejunum from the gastric lumen. Panel B shows the surgical gastrojejunostomy approach.

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respectively (risk difference -31.0%, 95% CI -47.6%-011.4%, P=0.002), and EUU-GE was associated with shorter time to solid diet (2 days vs 5 days, respectively) and shorter hospitalization (median 3 days vs 9 days, respectively). Quality of life assessed at the time of discharge also found higher quality of life score using the EORTC QLQ-C30 in the EUS-GE vs surgery group. Six-month mortality was 58% in the EUS-GE group and 42% in the surgical GJ group (P = 0.163). This study also evaluated mean total costs per admission to be lower for EUS-GE compared with surgery ($33,934 vs $51,437, respectively).

Prior to these RCTs, several observational studies had suggested that endoscopic GE could lead to shorter time to oral intake compared with surgical GE, although few studies were prospective. A recent systematic review/meta-analysis including a total of 484 patients found that EUS-GE had similar clinical success (defined as the ability to tolerate at least a liquid diet after the procedure) with fewer adverse events compared to surgical gastrojejunostomy, although surgical GE had higher technical success rates.[2] A subsequent network meta-analysis compared surgical gastrojejunostomy, EUS-GE, stomach-partitioning gastrojejunostomy (PGJ), and endoscopic stenting, which also found that EUS-GE was less likely to require reintervention than standard surgical GE, and EUS-GE and surgical GE had similar clinical success rates.[3]

While EUS-GE has been increasing in use over the last few years, current guidelines including those put forth by the American Society for Gastrointestinal Endoscopy (ASGE) in 2021 recommend surgical gastrojejunostomy or self-expanding metal stent (SEMS) placement in patients with malignant GOO undergoing palliative treatment but recommended surgical GJ in patients with a life expectancy of at least 6 months and good performance status.[4] At the time of that guideline creation the use of EUS-GE was not systematically assessed. This study provides needed evidence of the efficacy and durability of outcomes after EUS-GE compared with surgical GE in patients with limited life expectancy.

Key Study Findings

In patients with malignant GOO, EUS-GE resulted in shorter median time to resumption of oral intake compared with surgical GE (1 day vs 3 days, respectively) and was noninferior in terms of rates of reintervention (10% vs

Caution

Only about a quarter of patients were able to be followed up for 6 months in this study due to high rates of cancer-related mortality. These results may be less generalizable to patients with a longer life expectancy than those included in this study. Furthermore, surgical-GE is currently generally not recommended in patients with <6 month survival, and about 75% of the patients in this study died before the 6 month follow-up period. It is also important to note that the EUS-GEs performed in this study were done at high volume expert centers and thus may not be generalizable to centers with less expertise in this procedure. EUS-GE is a technically challenging procedure and adverse events with misdeployment can be very serious. The authors also note that this study did not include cancers extending into the distal stomach who also encounter issues with malignant GOO due to concerns about increased risk of anastomotic dysfunction so it is unclear how these results may apply to patients with these cancers.

My Practice

At my institution, interventional endoscopists work closely with the hepatobiliary surgery team to determine the optimal therapy for patients with malignant GOO. Both EUS-GE and uncovered duodenal stenting are typically considered in patients with more limited life expectancy and functional status, with EUS-GE considered more often in patients who may have closer to 3-6 months and duodenal stenting considered in patients with more limited life expectancy. Surgical GE may be more strongly considered in patients with at least 6 months life expectancy, but this may vary based on functional status and prior surgical history. Based on these

small trials, the existing data is likely not sufficient recommend endoscopic GE for all patients, but this certainly should be considered in patients with a life expectancy of around 6 months and especially as an alternative to duodenal stenting due to known issues with stent patency and reintervention.

For Future Research

Future study of patients with at least 6 months survival who could provide longer-term follow-up would be helpful to inform choice of therapy for patients who may have less limited life expectancy than those in this study and assess study outcomes such as reintervention in a larger population. The results of future cost-effectiveness studies that have been performed alongside this trial will also be helpful to inform therapy choices for health systems. Lastly, study on optimal endoscopist training to perform EUS-GE safely will also be critical as this procedure becomes more commonly performed given the technical expertise required.

Conflicts of Interest

The author has no reported conflicts of interest.

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