ENDOSCOPIC ULTRASOUND-GUIDED GASTROJEJUNOSTOMY VERSUS SURGICAL GASTROJEJUNOSTOMY AND ENTERAL STENTING FOR THE TREATMENT OF MALIGNANT GASTRIC OUTLET OBSTRUCTION: A SYSTEMATIC REVIEW AND META-ANALYSIS

J. Benchaya[1], Y. Chen[3], M. Martel[3], A.N. Barkun[2], J. Wyse[4], L. Ferri[2], C.S. Miller[4]

1. Medicine, McGill University Faculty of Medicine and Health Sciences, Montreal, QC, Canada; 2. McGill University Health Centre, Montreal, QC, Canada; 3. McGill University Health Centre, Montreal, QC, Canada; 4. Sir Mortimer B Davis Jewish General Hospital, Montreal, QC, Canada

Background: Gastric outlet obstruction (GOO), often encountered in advanced malignancy, is associated with debilitating symptoms and decreased quality of life. Traditional management of this condition has been surgical gastrojejunostomy (SGJ) or enteral stenting (ES). While SGJ is highly effective, it is invasive and associated with high rates of morbidity. ES provides a less invasive approach with a lower risk of adverse events; however, it is associated with a significant risk of stent dysfunction with increased need for reintervention. Endoscopic ultrasound-guided gastrojejunostomy (EUS-GJ) is a novel modality in the management of GOO that aims to endoscopically bypass the obstruction with a lumen-apposing metal stent, with early studies suggesting good effectiveness and safety outcomes; but the data are limited.

Aims: To perform a systematic review and meta-analysis comparing the clinical outcomes of EUS-GJ to more traditional treatments of malignant GOO.
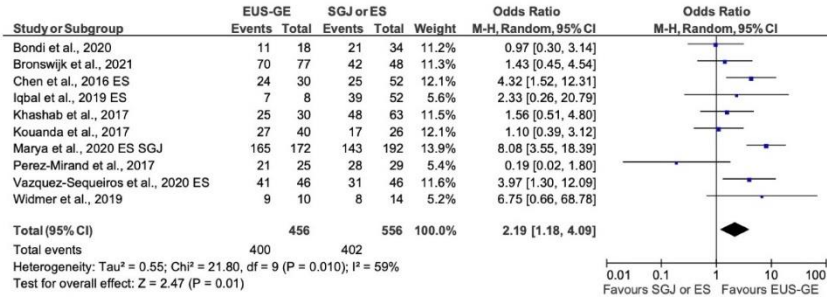
Methods: The study protocol was prospectively registered with the PROSPERO international database. The literature was systematically searched using MEDLINE, EMBASE and Web of Knowledge databases from inception through May 2021. Studies comparing EUS-GJ to ES or SGJ in patients with malignant GOO were included. Meta-analysis was performed with results reported as odds ratios (ORs) with 95% confidence intervals (CIs) using random effects models. The two primary outcomes of interest were clinical success without GOO recurrence and adverse events. Secondary outcome was technical success.

Results: Ten studies with a total of 1016 patients were included. EUS-GJ was associated with higher clinical success without GOO recurrence compared to SGJ or ES [OR: 2.19, 95% CI: 1.18-4.09, heterogeneity: P = 0.10; I^2 = 59%]. Subgroup analysis showed higher clinical success without GOO recurrence compared to ES [OR: 5.31, 95% CI: 3.07-9.17], but no significant difference compared to SGJ [OR: 1.69, 95% CI: 0.76-3.72]. EUS-GJ was associated with fewer adverse events compared to SGJ and ES [OR: 0.28, 95% CI: 0.14-0.55] and compared to SGJ alone [OR: 0.20, 95% CI: 0.10-0.37], but no difference was noted when compared to ES alone [OR: 0.53, 95% CI: 0.15-1.87]. EUS-GJ was associated with decreased technical success compared to SGJ and ES [OR: 0.26, 95% CI: 0.09 – 0.75] and SGJ alone [OR: 0.14, 95% CI: 0.04-0.48]; however, there was no difference when compared to ES alone [OR: 0.43, 95% CI: 0.05-3.44].
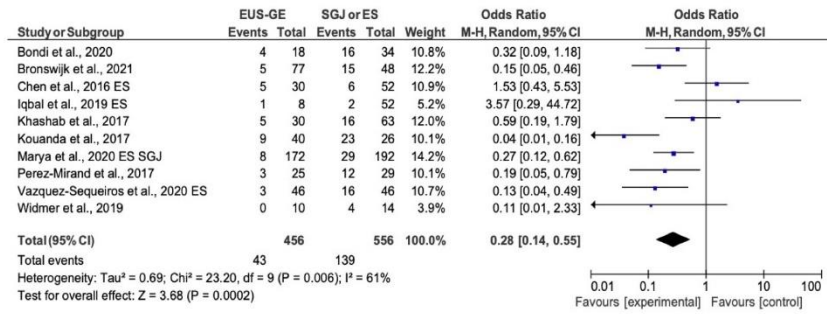
Conclusions: EUS-GJ provides a robust bypass with lower risk of recurrent obstruction

compared to ES and fewer adverse events compared to SGJ. High quality prospective studies are needed to further characterize the role of EUS-GJ in the management of malignant GOO.

A 1.1 Clinical success without GOO Recurrence and reintervention

Study or Subgroup	EUS-GE Events	Total	SGJ or ES Events	Total	Weight	Odds Ratio M-H, Random, 95% CI
Bondi et al., 2020	11	18	21	34	11.2%	0.97 [0.30, 3.14]
Bronswijk et al., 2021	70	77	42	48	11.3%	1.43 [0.45, 4.54]
Chen et al., 2016 ES	24	30	25	52	12.1%	4.32 [1.52, 12.31]
Iqbal et al., 2019 ES	7	8	39	52	5.6%	2.33 [0.26, 20.79]
Khashab et al., 2017	25	30	48	63	11.5%	1.56 [0.51, 4.80]
Kouanda et al., 2017	27	40	17	26	12.1%	1.10 [0.39, 3.12]
Marya et al., 2020 ES SGJ	165	172	143	192	13.9%	8.08 [3.55, 18.39]
Perez-Mirand et al., 2017	21	25	28	29	5.4%	0.19 [0.02, 1.80]
Vazquez-Sequeiros et al., 2020 ES	41	46	31	46	11.6%	3.97 [1.30, 12.09]
Widmer et al., 2019	9	10	8	14	5.2%	6.75 [0.66, 68.78]
Total (95% CI)		456		556	100.0%	2.19 [1.18, 4.09]
Total events	400		402			

Heterogeneity: Tau² = 0.55; Chi² = 21.80, df = 9 (P = 0.010); I² = 59%
Test for overall effect: Z = 2.47 (P = 0.01)

Favours SGJ or ES   Favours EUS-GE

B 1.7 AE Total

Study or Subgroup	EUS-GE Events	Total	SGJ or ES Events	Total	Weight	Odds Ratio M-H, Random, 95% CI
Bondi et al., 2020	4	18	16	34	10.8%	0.32 [0.09, 1.18]
Bronswijk et al., 2021	5	77	15	48	12.2%	0.15 [0.05, 0.46]
Chen et al., 2016 ES	5	30	6	52	10.9%	1.53 [0.43, 5.53]
Iqbal et al., 2019 ES	1	8	2	52	5.2%	3.57 [0.29, 44.72]
Khashab et al., 2017	5	30	16	63	12.0%	0.59 [0.19, 1.79]
Kouanda et al., 2017	9	40	23	26	10.1%	0.04 [0.01, 0.16]
Marya et al., 2020 ES SGJ	8	172	29	192	14.2%	0.27 [0.12, 0.62]
Perez-Mirand et al., 2017	3	25	12	29	10.1%	0.19 [0.05, 0.79]
Vazquez-Sequeiros et al., 2020 ES	3	46	16	46	10.7%	0.13 [0.04, 0.49]
Widmer et al., 2019	0	10	4	14	3.9%	0.11 [0.01, 2.33]
Total (95% CI)		456		556	100.0%	0.28 [0.14, 0.55]
Total events	43		139			

Heterogeneity: Tau² = 0.69; Chi² = 23.20, df = 9 (P = 0.006); I² = 61%
Test for overall effect: Z = 3.68 (P = 0.0002)

Favours [experimental]   Favours [control]