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Original article

Stent Duodenal in Malignant Obstruction of the Gastric Outflow Tract in a Reference Center in Cundinamarca: Case Series

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Abstract

Objective: To describe the experience of the insertion of the duodenal stent in patients with malignant obstruction of the gastric outflow tract in a third-level reference center in Cundinamarca. **Materials and methods:** Observational study, case series. Patients with Malignant gastric outlet obstruction (MGOO) diagnosed between December 2019 and February 2022 underwent the insertion of a self-expanding duodenal metal stent in the Gastroenterology unit of Hospital Universitario de la Samaritana. **Results:** 17 patients were enrolled, 76% of whom were male, with a mean age of 69 years (standard deviation [SD]: 11 years). Histology confirmed gastric adenocarcinoma was found in 82% of the patients, and 41% reported peritoneal carcinomatosis. We achieved total technical success (100%) and clinical success (88%) (15 patients). Regarding the size of the stent used, 35% (6 patients) were 12 cm, 53% (9 patients) were 9 cm, and 12% (2 patients) were 6 cm. Fluoroscopic and endoscopic guidance was used in 88% of cases. Patient survival at follow-up was an average of 84 days (2.8 months; range: 0-414 days) and currently, 1 patient continues in post-insertion surveillance for stent at the time described in the study. **Conclusion:** Duodenal stent is an effective and safe palliative management alternative in patients with MGOO that improves symptoms, particularly, oral tolerance and early hospital discharge in this group of patients (with advanced terminal neoplastic disease in the palliative management phase), reducing the need for surgical management.

Keywords

Gastric outlet obstruction, self-expandable metal stents, palliative care.

INTRODUCTION

Malignant gastric outlet obstruction (MGOO) is defined as mechanical obstruction of the pylorus or duodenum caused by extrinsic compression or infiltration from advanced locoregional neoplasms, which impede oral intake and lead to associated nutritional compromise[(1)]. This condition is due to the narrowing of the gastroduodenal region, delaying the passage of gastric contents from the stomach to the duodenum[(1,2)]. Gastroduodenal outlet tract stenosis is most frequently observed in patients with advanced gastric, duodenal, or pancreatic neoplasms[(1,3)]. This complication significantly affects the quality of life of these patients, which is why current palliative treatment strategies include surgical gastrojejunostomy, ultrasound-guided endoscopic gastroenterostomy, or the insertion of a duodenal stent[(2)]. Given the high surgical risk and short life expectancy of these patients, endoscopic management with duodenal stents has emerged as a non-surgical alternative to improve symptoms and quality of life, and to reduce hospital stays[(2)].

Gastroduodenal stents have been in use since the 1990s to offer a minimally invasive treatment for these cases[(3)]. The

technical effectiveness of stent insertion is approximately 97%, irrespective of the technique used (insertion through the working channel, fluoroscopic guide with endoscopic vision, or endoscopic guidance alone). The low rate of technical failure is primarily due to severe distal obstruction that prevents guide advancement for proper stent positioning[3,4]. Symptom resolution typically occurs around four days post-stent insertion, with improvements in food intake and oral tolerance seen in over 87% of cases. Cases where patients do not exhibit symptomatic improvement are usually due to disease progression or early stent migration[5].

The objective of this case series is to describe the experience of duodenal stent insertion in patients with malignant gastric outlet obstruction at a tertiary reference center in the department of Cundinamarca, Colombia.

MATERIALS AND METHODS

This is an observational study, presented as a case series. Data were collected from 17 patients over 18 years old diagnosed with MGOO between December 2019 and February 2022. These patients underwent duodenal self-expanding metal stent insertion in the gastroenterology unit at Hospital Universitario de la Samaritana.

The WallFlex™ duodenal self-expanding metal stent from Boston Scientific, available in sizes of 6 cm, 9 cm, and 12 cm, was used. The stent size was determined based on the length of the stenosis identified through upper gastrointestinal radiography, contrast-enhanced abdominal computed tomography (CT) scan, or during the endoscopic procedure when equipment passage through the stenosis was possible before stent deployment. Most procedures were performed with fluoroscopic guidance and under sedation managed by an anesthesiologist. The Olympus® EVIS Exera II CV 180 equipment was used.

RESULTS

Of the 17 patients included, 76% were men, with a mean age of 69 years (standard deviation [SD]: 11 years). The indication for duodenal stent insertion was malignant pyloric syndrome with oral intake intolerance in all cases (100%), primarily caused by gastric adenocarcinoma confirmed histologically in 82% (14 patients). In two patients, the obstruction was due to compression and infiltration by pancreatic cancer, and in one patient, there was no histological confirmation, with suspected lymphoproliferative disease. 12% (2 patients) had liver metastasis, and 41% (7 patients) had peritoneal carcinomatosis. The technical success rate was 100%, and clinical success, defined as tolerance to a liquid and soft diet, was 88% (15 patients). Clinical success was not achieved in two cases due to persistent nausea and vomiting caused by peritoneal carcinomatosis and distal obstruction. Regarding the stent sizes used, 35% (6 patients) had a 12 cm stent, 53% (9 patients) had a 9 cm stent, and 12% (2 patients) had a 6 cm stent. Fluoroscopic and endoscopic guidance was used in 88% of the cases, as illustrated in **Figure 1**. The average patient survival during follow-up was 84 days (2.8 months; range: 0-414 days), with one patient still under follow-up after stent insertion within the study period.

In patients with gastric adenocarcinoma, the obstruction was located above the papilla, whereas in others, it was due to infiltration of the duodenal bulb and the second portion. No patient experienced stent migration. Due to the short survival of the patients given their advanced oncological condition, no stent intrusion, migration, or obstruction was observed during follow-up. The clinical success allowed for early hospital discharge with tolerance to oral intake, and patients continued in end-of-life care management.

DISCUSSION

Malignant gastric outlet obstruction (MGOO) is caused by the narrowing of the gastroduodenal region, leading to a delay or failure in the passage of gastric contents from the stomach to the duodenum[1,2]. This condition typically presents with early satiety, weight loss, nausea, vomiting, and abdominal pain[1]. It is commonly found in patients with advanced gastric, duodenal, or pancreatic neoplasms[1,3]. In Colombia, the incidence rate of gastric cancer in 2020 was 12.8 per 100,000 inhabitants for both men and women, with a total of 8214 new cases, accounting for 7.5% of all diagnosed cancers[6]. The prevalence is 4.1%, corresponding to 11,611 cases over the past five years[6]. The mortality rate for the same year was 9.9 per 100,000 inhabitants, with 6451 deaths from this pathology, making it the third leading cause of cancer-related death[6].

Among the complications of gastric cancer, MGOO occurs in 20% of cases, significantly limiting curative treatment options[7]. MGOO manifests with symptoms such as nausea, difficult-to-manage vomiting, dehydration, abdominal pain, and malnutrition[8]. Other causes of gastric outlet obstruction include pancreatic neoplasms and, less frequently, duodenal or ampullary neoplasms, cholangiocarcinoma, lymphoma, or adenopathies from other neoplasms[9]. As previously noted, this complication severely impacts the quality of life of these patients. Current palliative treatment strategies include surgical gastrojejunostomy, ultrasound-guided endoscopic gastroenterostomy with LAMS (lumen-apposing metal stents), or the insertion of a duodenal stent[2].

The practice of inserting gastroduodenal stents for malignant pathology has demonstrated similar outcomes regar-

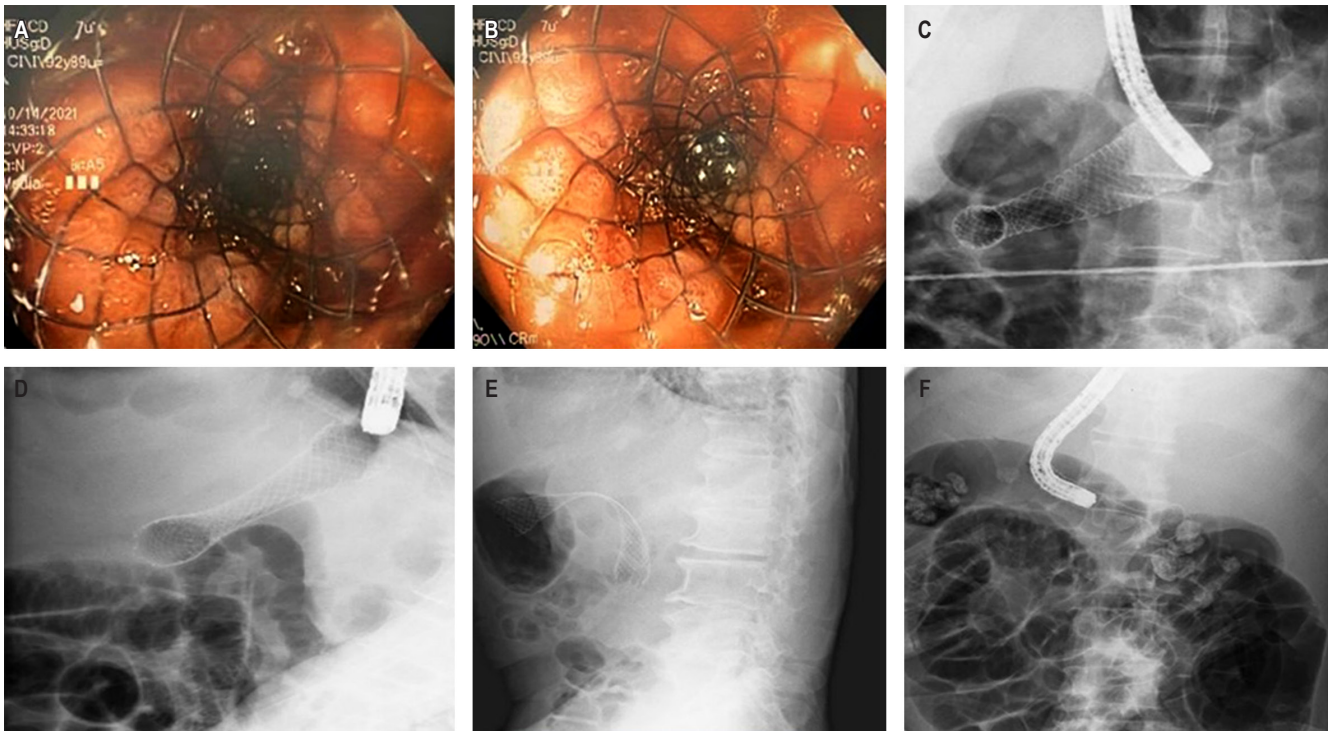


Figure 1. A and **B.** Endoscopic images from two cases showing the proximal cup of the deployed stent in the stenosis area. **C**, **D**, **E**, and **F.** Fluoroscopic images showing stent positioning in cases with different stent sizes. Source: Author's File.

ding success rates, adverse events, and improvements in symptoms and quality of life among experienced groups from Europe, Australia, Japan, and the United States[10-13]. It has been considered a feasible and safe procedure for managing malignant gastric outlet obstruction. In Colombia, studies have been published comparing duodenal stent insertion with gastrojejunostomy. Castaño and colleagues described a study with 70 patients, which found that the insertion of self-expanding metal stents resulted in better outcomes than surgery in terms of hospital stay duration, oral intake tolerance, and lower morbidity[14]. Another study conducted in Colombia by Vargas Rubio and colleagues with 31 patients with distal gastric cancer who underwent duodenal stent insertion showed similar results in effectiveness and symptom improvement compared to international studies[15].

When comparing the results from our patients with those described in the literature, the average age of our patients is similar to that reported by JP Ratone and colleagues[11]. Unlike reports from France and Spain, where the primary cause of MGOO is pancreatic cancer[10,11], in our study, as well as in the studies by Castaño and colleagues[14] and Vargas and colleagues[15], the primary cancer causing MGOO is gastric adenocarcinoma.

The technical success rate of stent placement in our study was 100%, comparable to what is reported in the literature, as was the clinical success rate, defined as tolerance to oral intake, which was 88% in our patients[3,5]. In the study by Vargas and colleagues[15], patient survival was 91 days, with similar findings in European case reports[10,11]. In our study, survival was slightly lower, which may be related to the tumor stage at diagnosis and the characteristics of the patients at our hospital. As a reference center for the department, we serve a population from distant rural areas with significant barriers to healthcare access, which may explain the late diagnosis and advanced disease stage at the time of diagnosis in our patients.

Regarding severe complications associated with the procedure, bleeding and perforation occur in about 1% of cases. Other non-severe complications include stent obstruction, abdominal pain, fever, vomiting, and stent migration[5]. No other complications were observed in our series. As noted earlier, patients without clinical success had distal obstruction of the stent due to peritoneal carcinomatosis.

In the palliation of malignant gastroduodenal obstruction, several studies have compared the efficacy of metallic gastroduodenal stents and lumen-apposing metal stents

released with ultrasound to the standard treatment of surgical gastrojejunostomy.

A study by Jeurnink and colleagues compared self-expanding metal stents with gastrojejunostomy for palliation of malignant gastroduodenal obstruction. The results indicated that self-expanding metal stents could be an effective alternative for palliation in these cases, while surgery is reserved for patients with a longer expected survival (more than six months)[16].

Nagaraja and colleagues conducted a meta-analysis comparing surgical gastrojejunostomy and endoscopic stenting for the palliation of malignant gastric outlet obstruction. The results suggest that stent placement is associated with better short-term outcomes, making duodenal stenting a safe means of palliating malignant stomach obstruction[17].

We do not have the availability or experience with the use of lumen-apposing metal stents for managing malignant gastric outlet obstruction at our institution.

CONCLUSIONS

Duodenal stenting is an effective and safe palliative management alternative for patients with MGOO, improving quality of life, tolerance to oral intake, and allowing for early hospital discharge, thereby reducing costs for the healthcare system and patients in managing this disease.

REFERENCES

1. Jue TL, Storm AC, Naveed M, Fishman DS, Qumseya BJ, McRee AJ, et al. ASGE guideline on the role of endoscopy in the management of benign and malignant gastroduodenal obstruction. Gastrointest Endosc. 2021;93(2):309-322.e4. https://doi.org/10.1016/j.gie.2020.07.063
2. Troncone E, Fugazza A, Cappello A, Del Vecchio Blanco G, Monteleone G, Repici A, et al. Malignant gastric outlet obstruction: Which is the best therapeutic option? World J Gastroenterol. 2020;26(16):1847-60. https://doi.org/10.3748/wjg.v26.i16.1847
3. Ding NS, Alexander S, Swan MP, Hair C, Wilson P, Clarebrough E, et al. Gastroduodenal outlet obstruction and palliative self-expandable metal stenting: A dual-centre experience. J Oncol. 2013;2013:167851. https://doi.org/10.1155/2013/167851
4. Reijm AN, Zellenrath PA, Van Der Bogt RD, Van Driel LMJW, Siersema PD, Bruno MJ, et al. Self-expandable duodenal metal stent placement for the palliation of gastric outlet obstruction over the past 20 years. Endoscopy. 2022;54(12):1139-46. https://doi.org/10.1055/a-1838-5642
5. Dormann AJ, Meisner S, Verin N, Wenk Lang A. Self-expanding metal stents for gastroduodenal malignancies: Systematic review of their clinical effectiveness. Endoscopy. 2004;36(6):543-50. https://doi.org/10.1055/s-2004-814434
6. Globocan, WHO. Estimated age-standardized incidence and mortality rates (World) in 2020, Colombia, both sexes, all ages [Internet]. Globocan, WHO; 2020 [15 de junio de 2022]. Disponible en: https://gco.iarc.who.int/media/globocan/factsheets/populations/170-colombia-fact-sheet.pdf
7. Tang SJ. Endoscopic stent placement for gastric outlet obstruction. Video J Encycl GI Endosc. 2013;1(1):133-6. https://doi.org/10.1016/S2212-0971(13)70057-8
8. Adler DG. Should Patients With Malignant Gastric Outlet Obstruction Receive Stents or Surgery? Clin Gastroenterol Hepatol. 2019;17(7):1242-4. https://doi.org/10.1016/j.cgh.2018.11.049
9. Chelsey C Ciambella, Rachel E Beard TJM. Current role of palliative interventions in advanced pancreatic cancer. World J Gastrointest Surg. 2018;10(7):75-83. https://doi.org/10.4240/wjgs.v10.i7.75
10. Alcalá-González LG, Masachs-Perecaula M, Dot Bach J, Abu-Suboh-Abadia M, Armengol Bertroli J, Pascasio-Hernández MJ, et al. Endoscopic stenting for gastroduodenal outlet obstruction of a malignant origin, real life experience in a single center. Rev Esp Enfermedades Dig. 2020;112(9):712-5. https://doi.org/10.17235/reed.2020.6600/2019
11. Ratone JP, Caillol F, Zemmour C, Bories E, Pesenti C, Lestelle V, et al. Outcomes of duodenal stenting: Experience in a French tertiary center with 220 cases. Dig Liver Dis. 2020;52(1):51-6. https://doi.org/10.1016/j.dld.2019.06.025
12. Van Halsema EE, Rauws EAJ, Fockens P, Van Hooft JE. Self-expandable metal stents for malignant gastric outlet obstruction: A pooled analysis of prospective literature. World J Gastroenterol. 2015;21(43):12468-81. https://doi.org/10.3748/wjg.v21.i43.12468
13. Miwa H, Sugimori K, Kaneko T, Ishii T, Iwase S, Irie K, et al. Clinical outcome of a highly flexible duodenal stent for gastric outlet obstruction: A multicenter prospective study. JGH Open. 2020;4(4):729-35. https://doi.org/10.1002/jgh3.12326
14. Castaño R, Álvarez O, Ruiz M, Juliao F, Cárdenas A, Sanín E, et al. Comparación entre la gastroyeyunostomía y el stent metálico autoexpandible para la paliación de la obstrucción maligna gastroduodenal. Rev Colomb Gastroenterol. 2006;21(1):11-8.

15. Vargas Rubio RD, Ovalle Hernández AF, Ursida Serrano V, Torres Arciniegas SC, Hani de Ardila AC. Experiencia con los stents metálicos autoexpandibles para el manejo de cáncer gástrico distal. Rev Gastroenterol Peru. 2018;38(4):331-9.
16. Jeurnink SM, Van Eijck CH, Steyerberg EW, Kuipers EJ, Siersema PD. Stent versus gastrojejunostomy for the palliation of gastric outlet obstruction: a systematic review. BMC Gastroenterol. 2007;7:18. https://doi.org/10.1186/1471-230X-7-18
17. Nagaraja V, Eslick GD, Cox MR. Endoscopic stenting versus operative gastrojejunostomy for malignant gastric outlet obstruction-a systematic review and meta-analysis of randomized and non-randomized trials. J Gastrointest Oncol. 2014;5(2):92-8. https://doi.org/10.3978/j.issn.2078-6891.2014.016