

Endoscopic treatment of neoplastic enteral obstruction by means of self-expanding metal stents



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BACKGROUND: Neoplastic gastroduodenal inoperable stenosis require a palliative treatment to restore alimentary transit.

OBJECTIVE: Our purpose was to treat neoplastic gastroduodenal stenosis with self-expanding enteral stents.

MATERIAL OF STUDY: An endoscopic treatment with uncovered self-expanding metal stents has been performed in 45 patients: 37 duodenal stenosis (34 pancreatic neoplasia, 1 gallbladder neoplasia, 2 peritoneal carcinosis), 5 antropyloric neoplastic stenosis and 3 gastro-jejunal anastomosis stenosis were treated. A total of 47 metal stent were positioned: in 43 patient 1 stent; in 2 patient, with a long stenosis, 2 stents. Main Outcome Measurement: Efficacy of endoscopic treatment to restore alimentary transit.

RESULTS: The positioning was successful in all cases without any complication. All patients had a rapid and satisfying recovery from symptoms connected to the obstruction. The hospitalization period was averagely 3 days (range 1-7). In one patient another stent was inserted 2 months later because of tumoral ingrowth. The median survival period was 4 months (range 1-5). In one patient with duodenal stenosis due to pancreatic neoplasia, in which were inserted 2 stents, distal one dislocated in the jejunum 3 months later. It was removed by surgery.

CONCLUSIONS: The endoscopic stenting is a valid treatment of inoperable gastric duodenal stenosis and may become the preferable option for the palliative treatment of this pathology.

KEY WORDS: Endoscopy, Gastroduodenal, Neoplasia, Obstruction, Stent

Introduction

The neoplastic gastric duodenal stenosis which cannot be treated by means of radical surgery intervention, require a palliative treatment in order to restore the alimentary transit. This may lead to an improvement of

the general status and, above all, it allows an acceptable live quality for the patient.

The ideal palliative therapy should have the subsequent characteristics:

- A high efficiency in eliminating the symptoms;
- A low risk for the patient with a rapid and significant improvement of his life quality;
- A short hospitalization period with an immediate reinsertion of the patient in his family and social environment;
- Low costs;

The palliative treatment of the gastric duodenal neoplastic stenosis may be performed by means of a gastrointestinal bypass, a recanalization of the stenosis or through a cutaneous jejunostomy.

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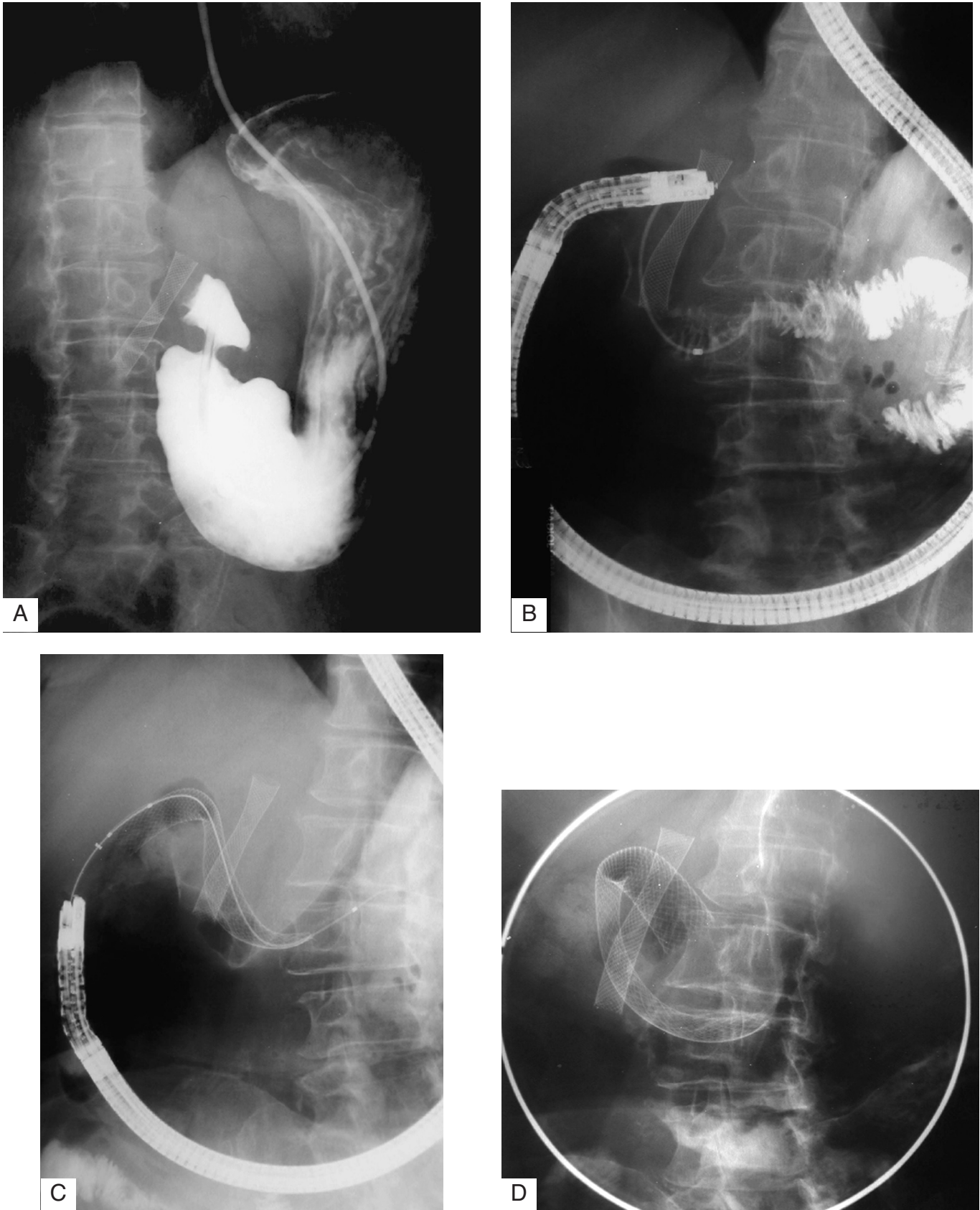


Fig. 1: (A) patient affected with pancreatic cancer, previously treated with biliary metallic stent. The x-ray examination shows the duodenal stenosis; (B) x-ray evaluation of duodenal stenosis by means of contrastography through a catheter endoscopically inserted; (C) opening of the duodenal stent on the guide wire; (D) completely expanded stent after removal of the release system and of the endoscope.

The gastrointestinal bypass may be performed in a laparotomic or laparoscopic way.

In these patients, laparotomic surgery is characterized by a comparatively high percentage of complications (15-37%) and a high mortality rate (2.5-19%)¹⁻⁵; mini invasive surgery is not always applicable and often requires a conversion⁶⁻⁸.

The cutaneous jejunostomy may solve the alimentary problem, but, apart from requiring a surgical intervention, it leads to a considerable physical and psychological discomfort with the patient. The recanalization of the stenosis through a stent placed endoscopically seems to be a satisfying solution for a good palliative treatment.

The recent usage of self-expanding metal enteral stents that may be introduced in the operator channel of the endoscope constitutes a further progress, both as regards the higher success percentage, and as regards the easy and rapid performance of the insertion procedures⁹⁻¹⁷.

The aim of this study is to report our experience in a consecutive series of patients using the same type of self-expanding uncovered TTS stent.

Patients and methods

We have treated 45 patients (27 F and 18 M) in the age group from 60 to 92 years: of these patients, 37 were affected by a duodenal stenosis which in 34 of the cases was due to a pancreatic tumor, in 2 due to peritoneal carcinosis and in 1 case due to a gallbladder neoplasia, 5 patients suffered from gastric stenosis due to an antrypyloric neoplasia, and 3 from gastro-jejunal anastomosis stenosis due to neoplastic recurrence after gastric resection for cancer.

All patients were declared inoperable and had persistent vomiting symptoms. The diagnosis was made through an endoscopic exam. Self-expanding uncovered metal stents TSS Enteral Wall Stent were inserted. These stents are available in two sizes, with a length of 6 and 9 cm; a 3 mm diameter in the closed position, becomes 22 mm after the expansion.

They are mounted on a flexible system that allows the passage through the endoscope with large channel and the subsequent release; the ends are equipped with radiopaque markers which are useful for a correct positioning.

The choice of the stent obviously depends on the length of the stenosis which is evaluated endoscopically and radiologically before and/during the procedure (Figg. 1a- b). If necessary, it is possible to apply several stents attached to one another, in the case of a longer stenosis.

The stenosis is passed, under radiological control, by a guide wire through the operator channel of the endoscope with lateral or axial vision.

The guide wire is advanced conventionally through the stricture and the stent is placed closed on the guide wire. Through an external release system, the expansion of the



Fig. 2: Two duodenal stents in patient with pancreatic cancer and biliary plastic stent.

distal extremity of the stent is determined making sure that it is placed beyond the stricture; subsequently the expansion of the entire stent is provoked so that its proximal end is placed upstream in relation to the stricture (Figg. 1c-d) and the release system is extracted.

These procedures are controlled both through endoscopic and radiologic observations. In 34 patients with duodenal stenosis due to a pancreatic tumor, we inserted a total of 36 enteral stents: for 27 of them, a 9 cm enteral stents was used; in 2 patient, with a long stenosis we used 2 connected stents (of 9 and 6 cm respectively). In the remaining 3 patients a 6 cm enteral stent was used. In the patient with gallbladder neoplasia a 9 cm stent was placed. In the 2 patients with duodenal stenosis due to peritoneal carcinosis a 9 cm stent was used. The 5 patients with a neoplastic stenosis of the antrypyloric channel were treated 3 with a 9 cm enteral stent and 2 with two 6 cm enteral stent. In 3 patient with a stenosis of gastro-jejunal anastomosis, we placed a 9 cm enteral stent.

Results

The stents were successfully inserted in all patients. There were no complications caused by the methods used. In all patients the control of the gastric emptying was performed through the ingestion of gastrographin after the insertion of the stent.

All patients experienced a rapid and satisfying solution of the symptoms connected to the obstruction.

In one patient with pancreatic cancer in whom we observed an obstruction due to tumoral ingrowth 2 months after stent insertion, another 9 cm stent was inserted (Fig. 2). In one patient with duodenal stenosis

due to pancreatic neoplasia, in which were inserted 2 stents, distal one dislocated in the jejunum 3 months later. It was removed by surgery.

The median hospitalization period was 3 days (range 1-7). The median survival period was 4 months (range 1-5).

Discussion

The endoscopic palliative treatment constitutes a valid therapeutic option for the treatment of patient with inoperable gastric and duodenal neoplastic stenosis.

It is, in fact, characterized by a lesser mortality degree and a lower complication percentage as compared to laparotomic surgery or laparoscopy, though its efficiency is the same.

The endoscopic treatment which determines an immediate recanalization of the stenosis, allows a rapid alimentary restoration with an improvement of the general status, a better life quality also from the psychological viewpoint of the patient and a reduction of the post-operative hospitalization period^{18,19}.

Some authors report some degree of precocious complications (1-1.5%) (migration, perforation) and of subsequent complications (dislocation and regrowth of the tumor through the grids with a subsequent obstruction^{11,12,20-24}; in the cases of this study, we did not observe any complications.

At present, there are self-expanding stents with metal grids available with or without external sheathing.

The advantage of these covered metal stents is that it avoids the tumor ingrowth through the wire mesh; a disadvantage is that they may migrate more easily towards the stenosis. Furthermore, these stent, due to their diameter at the closing section (>5 mm) cannot be positioned by introducing them directly through the endoscope, but must glide on a free guide wire which is inserted in advance with the endoscope towards the stenosis; this leads to difficulties in positioning the unit due to the angle of the introducing system in relation to the great gastric curve, thus determining in certain cases the failure of the positioning²⁵⁻²⁶.

Furthermore, it is important to evidence the fact that a covered stent makes biliar endoscopical prothesization impossible due to the obstruction of the biliar way.

The advantage of the metal uncovered stents used by us (Wallflex Boston Scientific) is characterized by the easier positioning which almost entirely eliminates any technical failures or complications; furthermore, they do not obstruct the vaterian area and this may allow a subsequent insertion of biliar stents in the case of obstructive icterus^{26,27}. The only shortcoming may be the tumoral growth inside the wire mesh with a consequent obstruction; however, this complication is rare due to the short life expectancy of the treated patients. In rare cases indicated in literature, the complication may be solved by the introduction of coaxial enteral stents.

Conclusions

According to our experiences and the data supplied by literature, we can conclude that in the case of inoperable gastrointestinal stenosis, the endoscopic treatment with metal self-expanding stents (Wallflex Boston Scientific) is to be considered a valid alternative to surgical treatment and, if the data are confirmed by more ample case studies, it may be the best choice therapeutically speaking.

Riassunto

OBIETTIVO: Le stenosi neoplastiche gastroenteriche che non possono essere trattate mediante un intervento chirurgico radicale, richiedono un trattamento palliativo allo scopo di ripristinare il transito alimentare. La ricanalizzazione della stenosi attraverso uno stent posizionato endoscopicamente sembra essere una soluzione soddisfacente per un buon trattamento palliativo.

Lo scopo di questo studio è di riportare la nostra esperienza in una serie consecutiva di pazienti usando lo stesso tipo di protesi auto-espandibili non ricoperte attraverso l'endoscopia.

PAZIENTI E METODI: Un trattamento endoscopico con stent metallici auto-espandibili è stato eseguito in 45 pazienti: sono state trattate 37 stenosi duodenali (34 dovute a neoplasia pancreatica, 1 ad una neoplasia della colecisti, 2 a carcinosi peritoneale), 5 antropiloriche e 3 stenosi della anastomosi gastro-digiunale.

Sono stati posizionati 47 stent metallici: in 43 pazienti è stato posizionato 1 stent; in 2 pazienti, con una lunga stenosi, 2 stent.

RISULTATI: Il posizionamento è stato eseguito con successo in tutti i casi senza nessuna complicanza. Tutti i pazienti hanno avuto un rapido miglioramento dei sintomi connessi all'ostruzione. Il periodo di degenza è stato di tre giorni (range 1-7). In un paziente è stato inserito un altro stent due mesi dopo per la ricrescita del tumore. Il periodo medio di sopravvivenza è stato di 4 mesi (range 1-5). In un paziente con stenosi duodenale dovuta a neoplasia pancreatica, nel quale erano inseriti 2 stent, uno si è dislocato nel digiuno 3 mesi dopo ed è stato rimosso chirurgicamente.

DISCUSSIONE: Il trattamento endoscopico determina una immediata delle stenosi e consente un rapido ripristino alimentare con un miglioramento dello stato generale, una qualità di vita migliore anche dal punto di vista psicologico del paziente e una riduzione del periodo di degenza post operatoria.

CONCLUSIONI: Il posizionamento endoscopico di stent costituisce un valido trattamento per le stenosi inoperabili gastriche e duodenali e può diventare l'operazione preferibile per il trattamento palliativo di questa patologia.

References

1. Isla AM, Worthington T, Kakkar AK, Williamson RC: *A continuing role for surgical bypass in the palliative treatment of pancreatic carcinoma*. Dig Surg, 2000; 17:143-46.
2. Lillemoe KD: *Current management of pancreatic carcinoma*. Ann Surg, 1995; 221:133-48.
3. Lillemoe KD, Cameron JL, Hardacre JM, Sohn TA, Sauter PK, Coleman J et al.: *Is prophylactic gastrojejunostomy indicated for unresectable periampullary cancer? A prospective randomized trial*. Ann Surg, 1999; 230:322-28.
4. Weaver DW, Wiencek RG, Bouwman DL, Walt AJ: *Gastrojejunostomy: is it helpful for patient with pancreatic cancer?* Surgery, 1987; 102:608-13.
5. Zamboni WA, Fisher KS, Ross DS: *Surgical palliation for pancreatic carcinoma*. Postgrad Med J, 1991; 67:362-65.
6. Huibregtse K, Katon RM, Tytgat GN: *Endoscopic palliative treatment in pancreatic cancer*. Gastroint Endosc, 1986; 32:334-38.
7. Huguier M, Baumel H, Manderscheid JC, Houry S, Fabre JM: *Surgical palliation for unresected cancer of exocrine pancreas*. Eur J Sur Oncol, 1993; 19:342-47.
8. Hyodo T, Yoshida Y, Yamanaka T, Imawari M: *Duodenal stenosis after endoscopic biliary metallic stent placement for malignant biliary stenosis*. Gastroint Endosc, 2000; 52:64-66.
9. Adler DG, Baron TH: *Endoscopic palliation of gastric malignant outlet obstruction with self-expanding metal stent: Experience in 36 patients*. Am J Gastroenterol, 2002; 31:291-98.
10. Andersen JR, Sorensen SM, Kruse A, Rokkjaer M, Matzen P: *Randomized trial of endoscopic endoprosthesis versus operative bypass in malignant obstructive jaundice*. Gut, 1989; 30:1132-35.
11. Feretis C, Benakis P, Dimopoulos C, Georgopoulos K, Milas F, Manouras A, Apostolidis N: *Palliation of gastric malignant outlet obstruction with self-expanding metal stent*. Endoscopy, 1996; 28:225-28.
12. Feretis C, Benakis P, Dimopoulos C, Georgopoulos K, Milas F, Manouras A, Apostolidis N: *Duodenal obstruction caused by pancreatic head carcinoma: Palliation with self-expanding endoprosthesis*. Gastroint Endosc, 1997; 46:161-65.
13. Jung GS, Song HY, Kang SG, Huh JD, Park SJ, Koo JY, Cho YD: *Malignant gastroduodenal obstructions. Treatment by means a covered expandable metallic stent initial experience*. Radiology, 2000; 216:758-63.
14. Kaw M, Singh S, Gagneja H, Azad P: *Role of self-expanding metal stent in the palliation of the malignant duodenal obstruction*. Surg End, 2003; 17:646-50.
15. Truong S, Bohndorf V, Geller H, Schumpelick V, Gunther RW: *Self expanding metal stent for palliation of malignant gastric outlet obstruction*. Endoscopy, 1992; 24:433-35.
16. Yates Mr 3rd, Morgan De, Baron TH: *Palliation of malignant gastric and small intestinal stricture with self-expandable metal stent*. Endoscopy, 1998; 30:266-72.
17. Yim HB, Jacobson BC, Saltzman JR, Johannes RS, Bounds BC, Lee JH et al.: *Clinical outcome of the use of enteral stents for palliation of patient with malignant upper GI obstruction*. Gastroint Endosc, 2001; 53:329-32.
18. Dormann A, Meisner S, Verin N, Wenk Lang A: *Self-expanding metal stents for gastroduodenal malignancies: systematic review of their clinical effectiveness*. Endoscopy, 2004; 36:543-50.
19. Kim JH, Song HY, Shin JH, Choi E, Kim TW, jung HY et al.: *Metallic stent placement in the palliative treatment of malignant gastroduodenal obstruction: Prospective evaluation of results and factors influencing outcome in 213 patients*. Gastroint Endosc, 2007; 66:256-64.
20. Kim JH, Yoo BM, Lee KJ, Hahm KB, Cho SW, Park JJ et al.: *Self expanding coil stent with a long delivery system for palliation of a unresectable malignant gastric outlet obstruction: A prospective study*. Endoscopy, 2001; 33:838-42.
21. Havemann MC, Adamsen S, Wojdemann M: *Malignant gastric outlet obstruction managed by endoscopic stenting. A prospective single center study*. Scan J Gastroenterol, 2009; 44:248-51.
22. Soetikno RM, Carr-Locke DL: *Expandable metal stent for gastric outlet, duodenal and small intestinal obstruction*. Gastroint endosc Clin North Am, 1999; 9:447-58.
23. Sommer A, Bethge N: *Relief of malignant external gastric obstruction by endoscopic implantation of self-expanding metal stent*. Endoscopy, 1995; 27:210-11.
24. Song HY, Yang DH, Kuh JH, Choi KC: *Obstructing cancer of the gastric antrum: Palliative treatment with covered metallic stent*. Radiology, 1993; 187:357-58.
25. Nassif T, Prat F, Meduri B, Fritsch J, Choury AD, Dumont JL et al.: *Endoscopic palliation of malignant gastric outlet obstruction using self-expandable metallic stents: Results of a multicenter study*. Endoscopy, 2003; 35:483-89.
26. Bang S, Kim HJ, Park YS, Kim MH, Park SW, Lee YC, Song SY: *Effectiveness of self-expanding metal stents for malignant antral and duodenal obstruction with a comparison between covered and uncovered stents*. Hepatogastroenterology, 2008; 55:2091-95.
27. Maetani I, Ogawa S, Hoshi H, Sato M, Yoshioka H, Igarashi Y et al.: *Self-expanding metal stents for palliation of malignant biliary and duodenal obstruction*. Endoscopy, 1994; 26:701-04.

