Malignant pyloro-duodenal obstruction: Role of self expandable metallic stents

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Abstract

Objective: To determine the outcome of duodenal stenting in palliation of patients with malignant pyloric and duodenal obstruction.
Methods: The non-randomised prospective descriptive study was conducted at the Endoscopy Suite, Surgical Unit-IV, Civil Hospital, Karachi, from December 2007 to November 2010. All patients presenting with inoperable ampullary, pancreatic or biliary cancers causing duodenal obstruction and patients with resectable malignancy but unfit for surgery were included. The procedure was carried out by a single expert endoscopist under local or general anaesthaesia as required. Boston Scientific stents of variable sizes were used. Follow-up was done at 1 week, 1 month and 6 months. Data analysis was done using SPSS 15.
Results: Over the study period, 159 (60%) males and 6 (40%) females were included in the study. The male-to-female ratio was 2:3. The overall age ranged from 25-80 years with a mean of 52.67±15.07 years. Primary diagnosis was pyloric carcinoma in 7(46.6%), carcinoma Gallbladder in 4(26.6%), Duodenal carcinoma in 3(20%) and carcinoma head of pancreas in 1(6.6%). Relief of symptoms were seen in 11 (73.3%), while complications were seen in 2 (13.3%). Stents were inserted with technical success in 14 (93%) patients. Clinical success was seen in 11 (73%), with a mean survival of 74.27±40.7 days (range: 15-180 days). No statistical significance was found when comparing the survival time with age, gender and diagnosis.
Conclusion: Use of self-expandable metallic stents for gastroduodenal malignancies appears to be a feasible, safe and effective method, especially in those patients with limited life expectancy.
Keywords: Self Expandable Metallic Stent (SEMS), Duodenal stenting, Gastric outlet obstruction (GOO). (JPMA 64: 16; 2014).

Introduction

Malignant pyloroduodenal obstruction is caused either by primary gastric or duodenal carcinomas or by invasion from adjacent pancreatic, biliary or gallbladder carcinomas. These may be associated with obstructive jaundice, especially with unresectable malignancy around the pancreatic head, carcinoma gallbladder or duodenal malignancy obstructing the ampulla. Management of these advanced malignancies can be quite a difficult challenge due to intractable vomiting, pain, indigestion and its associated nutritional deficiencies. The main aim of the management in these patients is relief of obstruction and restoration of oral diet.
Different modalities of treatment in these patients include open surgical bypass or minimally invasive methods like endoscopy or laparoscopy. Controversy persists regarding the optimum palliative treatment. As the median survival of these patients is usually short,[1] use of surgery is a matter of debate. With the advent of minimally invasive era, self expandable metallic stents have come up as a desirable alternative to bypass surgery.[2,3] Self expandable metallic stenting (SEMS) has been reported

to be a safe[4] and effective palliative option but results are limited by short available follow up due to short survival of these patients.[5] Several studies have shown the efficacy of stent placement in terms of short hospital stay, early resumption of enteral feeding and less hospital cost in comparison to the palliative surgery.[6,7]
We report our experience of the use of SEMS in patients with irresectable malignant gastroduodenal obstructions.

Patients and Methods

The non-randomised prospective descriptive study was conducted at the Endoscopy Suite, Surgical Unit-IV, Civil Hospital, Karachi, from December 2007 to November 2010.
All patients presenting with irresectable ampullary, pancreatic or biliary cancers causing duodenal obstruction and patients with resectable malignancy but unfit for surgery were included in the study. Obstruction was confirmed by symptoms, radiography and endoscopy. Inoperability was determined by diagnostic imaging techniques, including ultrasound, computed tomography (CT) scan and endoscopic ultrasound. Consent was taken from all the patients and the study was approved by the institutional ethical committee.
Severity of dysphagia was gauged on score of one to five on the basis of patient's ability to tolerate diet: Regular diet; Soft diet; Liquid diet; Saliva/water ingestion; and unable to take anything per-orally. Procedure was done by a single expert endoscopist under conscious sedation or general anaesthaesia where required. Boston Scientific stents of variable sizes were used.
Therapeutic scope was used for all the procedures. The stricture was negotiated with a guide wire under fluoroscopy. Contrast was then injected through a cannula to determine the position and extent of the stricture and to rule out distal obstruction. After the selection of the appropriate size of duodenal stent, stent assembly was introduced over the guide wire and positioned across the stricture. Stent deployment with expansion was checked. Contrast was injected to confirm the position and patency. In patients having double biliary and pyloroduodenal obstruction, balloon dilatation of duodenal obstruction was done to facilitate Endoscopic Retrograde Cholangiopancreatography (ERCP) scope to pass into the duodenum. Biliary metallic stent was placed first followed by the duodenal stent.
After recovery from sedation the patients were kept under observation for 24 hours and monitored for perforation, bleeding and incomplete expansion. The patients were allowed liquids after 2 hours and solids after confirmation of expansion of the stent at 24 hours. Gastrograffin studies were advised in case of suspected complications and recurrence of symptoms. Effect of duodenal stenting in terms of immediate complications, response to stenting in terms of relief of symptoms, and ability to take orally were recorded. Followup was done at 1 week, 1 month and 6 months.
Technical success was defined as satisfactory deployment and precise positioning of stent at the site of stenosis or obstruction. Clinical success was defined as improvement of oral intake by at least one grade. Results were analysed using SPSS version 15. Frequencies and descriptive analysis, including mean, range and standard deviation, was done for different variables. Cross-tabulation was done between two variables. Survival time was taken out by Kaplan-Meier survival curves.

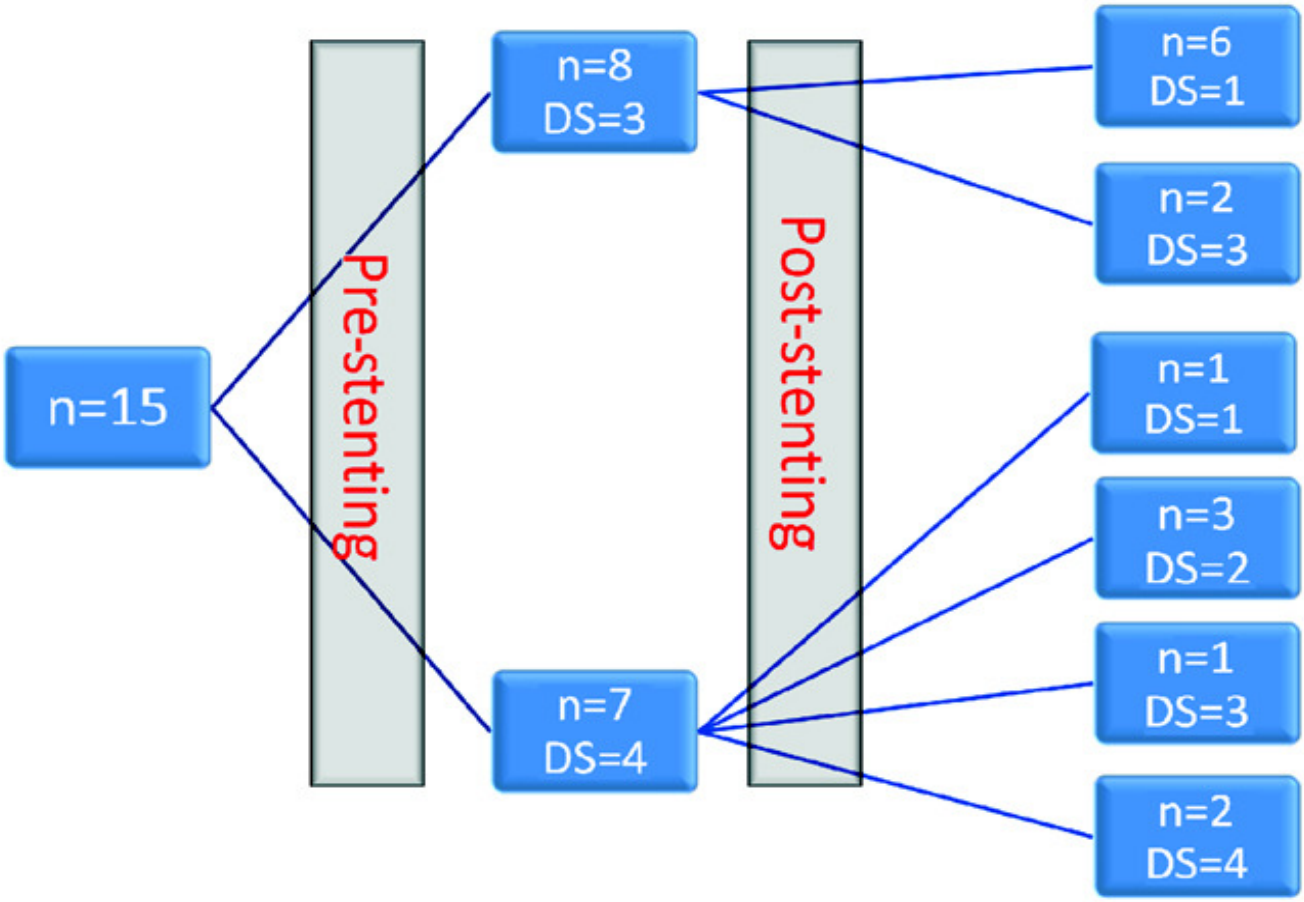
Results

Of the 15 patients in the study, 9 (60%) were males and 6 (40%) females. The male-to-female ratio was 2:3. Overall age of the study population ranged from 25-80 years (mean: 52.67±15.07 years). Primary diagnosis was pyloric carcinoma in 7(46.6%), carcinoma gallbladder in 4(26.6%), duodenal carcinoma in 3(20%) and carcinoma head of pancreas in 1(6.6%) (Table).

Table-1: Indications of enteral stenting.

	Frequency	Percentage
Pyloric carcinoma	7	46.6
Carcinoma gall bladder	4	26.6
Duodenal adenocarcinomas	3	20
Carcinoma head of pancreas	1	6.6

Tolerance to feed pre- and post-stenting was noted (Figure-1).



DS: Dysphagia Score.

Figure-1: Comparison of dysphagia between pre and post-stenting.

Relief of symptoms was seen in 11 (73.3%) patients, whereas in 4 (26.6%) there was no improvement. Complications were seen in 2 (13.3%), perforation in 1 (6.6%) and stent obstruction in 1 (6.6%). Double stents were placed in 6 (40%) patients.

Stents were inserted with technical success in 14 (93%). One patient had perforation during the stent insertion so the stent was taken out. Clinical success was seen in 11 (73%). Mean survival was 74.27±40.7 (range: 15-180 days) (Figure-2).

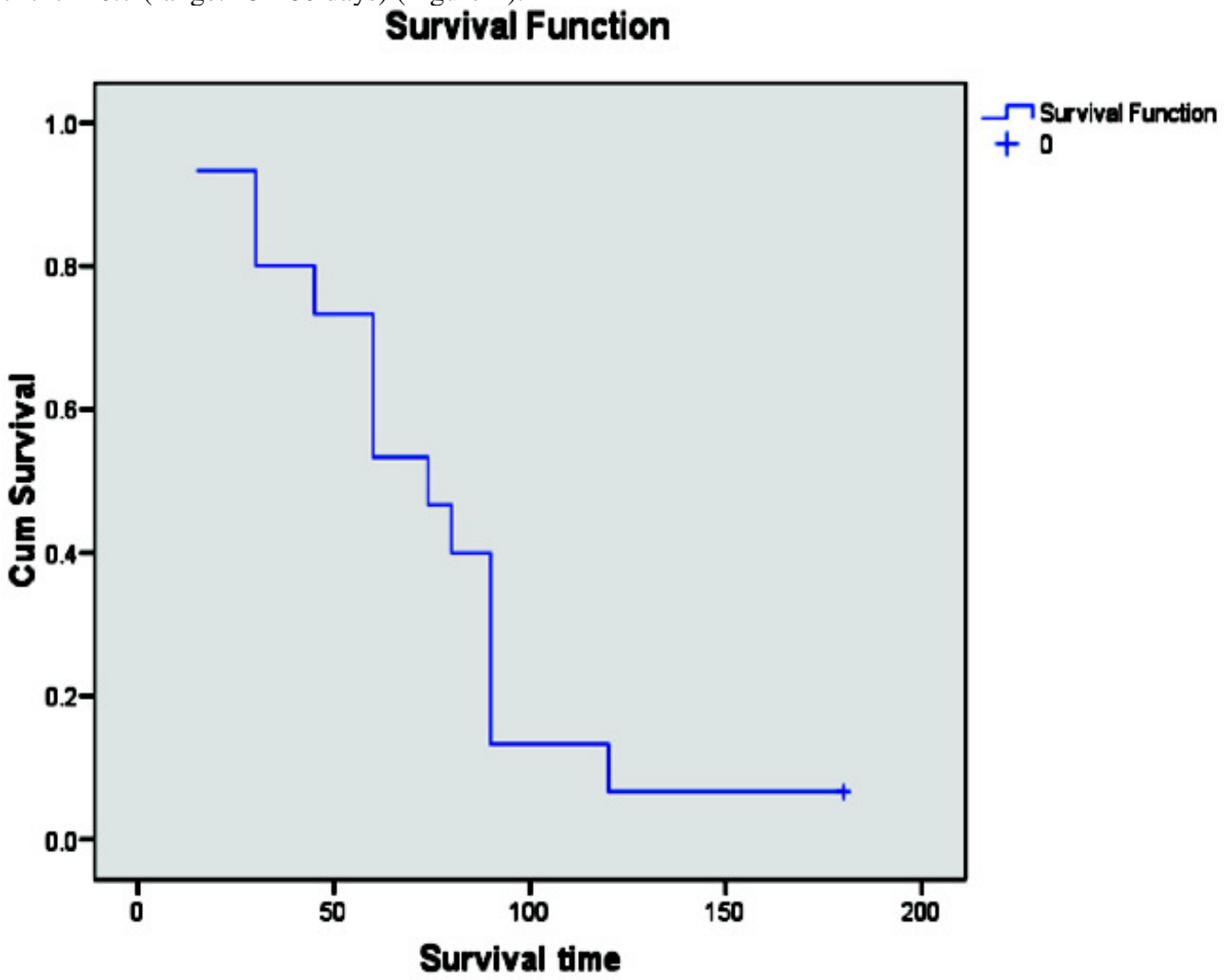


Figure-2: Kaplan-Meier survival curve (mean: 74.27±40.7 days; standard error: 10.15; 95% Confidence Interval: 54.37-94.17).

One patient was surviving at last follow up i.e 6 months after stenting.
No statistical significance was found when comparing the survival time with age, gender and diagnosis.

Discussion

Several studies have assessed the efficacy of SEMS in the palliative treatment of patients with inoperable pyloroduodenal and pancreaticobiliary malignant obstructions. Our study is the first to look at the role of SEMS in our country.
The best palliative modality for malignant pylorodudoenal obstruction is yet to be agreed upon because of paucity of comparative studies on endoscopic and surgical modality.[8] Moreover, no study has addressed "prospectively", the advantages and cost effectiveness of duodenal stents placement in comparison to surgery. Most patients are referred for this mode of treatment when they are not fit for

surgery, making comparative studies between the two modalities inappropriate. Surgical gastroenterosotomy, no doubt, has higher success rate of bypassing the obstruction, but has a morbidity rate of 40% with prolonged hospital stay and prolonged time to enteral feed.

Recently a number of comparative trials have shown significant advantage of stents over bypass surgery. Fioli et al[9] conducted a randomised trial showing a better outcome, shorter hospital stay and early resumption of oral intake in enteral stent patients. Enteral stents are today considered a viable alternative to surgery keeping in view the pre-terminal state and short life expectancy of these patients. Initially enteral stenting was done with uncovered stents,[10,11] but these were found to have limitations of tumour in-growth through the mesh. Self expandable covered metallic stents have an advantage of preventing tumour ingrowth, being less invasive, less painful with easy insertion and no need of pre-dilatation with balloon.[12] The stents used in our study were also through the scope self expandable uncovered metallic stents.

A recent randomized prospective study comparing the use of covered SEMS vs uncovered SEMS enrolling 40 patients with gastric cancer in each group, demonstrated a higher stent migration rate within 8 weeks of stent placement in the covered SEMS group (25.8%) than in the uncovered SEMS group (2.8%). At the same time, the re-stenosis rate related to tumour in-growth was higher in the uncovered SEMS group (25.0%) than in the covered SEMS (0.0%). In that study, a routine endoscopy was performed independent of obstruction symptoms, which could explain the higher migration rates.[13]

Literature reveals that gastric carcinoma is the most common cause of metallic stent placement for gastric outlet obstruction.[14] We had 7 (46.6%) patients with pyloric cancer who underwent enteral stenting.

Clinical success response in our study was 73.3% whereas the technical and clinical success rates reported in literature are 75-100% and 77-100% respectively.[8] We had no response in 4 patients; of these, 3 had advanced malignancy with peritoneal involvement so their clinical response was not achieved despite having patent stent. The absence of peritoneal carcinomatosis and multiple small bowel strictures is a key point for the clinical success of duodenal SEMS.[15] The technical success was 93.3% which is in accordance with that given in the literature.[7]

Several complications are associated with duodenal stenting. These include stent migration, tumour in growth/overgrowth, gastrointestinal bleeding, perforation and stent migration.[16] The overall complication rate in our patients was 13.3% (2/15) which is lower than 17-28% seen in other studies.[7,17,18] We had stent obstruction in one patient and perforation in another. Perforation commonly occurs when a metallic stent is placed at the curved duodenal C loop because the sharp edge of the metallic stent may abut the normal duodenal mucosa, causing wall pressure necrosis, bleeding and perforation as a result of straightening and shortening of stent and expansion.[19] From our experience, the placement of the stent across the pylorus is easier and makes the curve of stent better than when the stent is placed within the duodenal area. We had perforation in one patient in whom stent was placed in the duodenum. Patient underwent surgery where stent was retrieved and bypass fashioned.[20]

Conclusion

Use of SEMS for gastroduodenal malignancies appears to be a feasible, safe and effective method, especially in patients with limited life expectancy or in more critical conditions, allowing improvement not only in nutritional status, but also in the quality of life. Palliative treatment of gastric outlet obstruction with the placement of an expandable metal stent may improve the tolerability of food intake.

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