

SELF-EXPANDABLE METAL STENTS IN PALLIATION OF MALIGNANT ESOPHAGEAL OBSTRUCTION

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ABSTRACT

Background: More than half patients with carcinoma esophagus are inoperable at the time of presentation. A number of treatment options are available to relieve dysphagia. The aim of this study was to evaluate the results of self expandable metal stents for the treatment of malignant dysphagia.

Material & Methods: This descriptive study was conducted at Gastroenterology Department, Hayatabad Medical Complex Peshawar from January 2006 to August 2009. Thirteen patients with grade 3 or 4 dysphagia due to inoperable carcinoma esophagus underwent Self Expandable Metal Stenting under endoscopic guidance. They were followed for one month. Dysphagia score was calculated at baseline and at follow up according to Atkinson's scale. Patients were assessed for complications. Data was analyzed using SPSS version 10.

Results: Mean age of patients was 47.5 ± 15 years with male to female ratio of 1:1.6. Mean dysphagia score improved from 3.4 (pre-stent) to 1.07 (post-stent) ($p < 0.05$). Improvement in dysphagia (conversion of grade 3 or 4 dysphagia into grade 1 or 0) was seen in 92.3% patients. Perforation occurred in one patient. Three patients required re-intervention after initial improvement; two for their stent blockage (15.4%) and one for stent migration (7.7%). Other minor complications like cough and regurgitation occurred in 15.4% and 38.5% patients respectively. Thirty-one percent of patients experienced severe chest pain necessitating narcotic analgesics.

Conclusion: In patients with inoperable carcinoma esophagus self expandable metal stents are an effective method for palliation of dysphagia but not without complications.

Key words: Esophageal carcinoma, Malignant dysphagia, Palliation, Stent.

INTRODUCTION

Cancer of the esophagus is the 9th most common malignancy world wide and third common amongst gastrointestinal malignancies.^{1,2} It is the 6th most common cause of cancer deaths universally.^{3,4} Most patients with esophageal cancer present with dysphagia, and more than half the patients have inoperable disease at the time of presentation.^{5,6} The primary aim of treatment in these patients is to relieve dysphagia with minimal morbidity and mortality, and thus improve their quality of life.

A number of treatment options are available to relieve dysphagia, including esophageal dilatation, intraluminal stents, Nd:YAG laser therapy, photodynamic therapy, argon laser, systemic chemotherapy, external beam radiation therapy, brachytherapy, and combined chemoradiation therapy. Each of these modalities has its merits and demerits. Based on the availability, clinical situation, local expertise, adverse effects, cost of

treatment and patient preference, either one or a combination of modalities can be used for the relief of dysphagia.^{7,8}

In recent times, placement of a self-expanding metal stent (SEMS) has become established as a treatment modality for the palliation of malignant dysphagia. SEMS relieves dysphagia rapidly and improves the nutritional status of the patient.^{9,10} The major disadvantages of SEMS include high cost, tumor in-growth, and relatively common acute and late complications, including chest pain, regurgitation, cough and foreign body sensation, stent migration, blockage and hemorrhage.¹¹

The aim of this study was to evaluate the results of esophageal SEMS for the treatment of malignant dysphagia.

PATIENTS AND METHODS

This prospective study was carried out at the Gastroenterology Department of Hayatabad

Medical Complex Peshawar from January 2006 to August 2009.

All patients presenting with dysphagia underwent a thorough history and physical examination. Upper GI endoscopy and biopsy was done to confirm the diagnosis. Imaging studies (Chest X-ray, Ultrasound abdomen and CT scan chest and abdomen) were done to assess local and distant disease extent. Dysphagia was graded according to Atkinson's score: grade 0: ability to eat normal diet; grade 1: ability to eat some solid food; grade 2: ability to eat some semisolid food; grade 3: ability to swallow liquids only; and grade 4: complete obstruction.

We used uncovered stents in all patients (Wilson Cook). The inner diameter of the central portion of the stent is 17-18 mm when fully expanded. The ends of the stent measure 28 mm in diameter. They are flanged to facilitate anchoring of the stent to the esophageal wall. A 39F (13mm) delivery system is used for insertion of the stent and consists of three coaxially arranged polypropylene tubes. The stent is preloaded on the inner tube while the outer tube compresses the stent. The central lumen of the inner tube allows guide wire insertion.

Technique of stent insertion:

The procedure was performed under local anesthetic spray, with intravenous sedation as and when required. We used uncovered stents in all patients. Stents were inserted under endoscopic guidance. First upper gastrointestinal endoscopy was performed to delineate the site and length of stricture with patient placed in the left lateral position. To facilitate rapid expansion of stent; dilatation was done in all patients up to 15mm with Savary Gilliard dilators. Proximal and distal margin of tumor or stricture site was determined with scope in situ.

Length of stent was chosen so that at least 2.5cms of normal esophagus was covered above and below the stricture. The guide wire was inserted through the stricture via an endoscope, and the stent system was passed over it, released and deployed. Position of stent was confirmed endoscopically at the end of the procedure.

Oral liquids were allowed 4 h after the procedure, and then gradually increased to semi-solids and then to solids over the next 24 h. postoperatively. A chest roentgenogram was taken to exclude perforation and check the stent position.

Patients were kept in hospital for 24 hours and then discharged if there were no complications. They were then followed up weekly for one

month. At each follow up visit symptoms of complications of stent and dysphagia score of each patient were determined.

Data was analyzed by statistical software SPSS version 10. Chi-square test was used for comparison of pre and post stent mean dysphagia score. A p-value of <0.05 was considered significant.

RESULTS

Thirteen patients with grade 3 and grade 4 dysphagia due to inoperable carcinoma esophagus, either because of locally advanced disease, distant metastasis, co-morbidities or poor general health status, were included in the study. Patients with carcinoma of cervical esophagus were excluded. Characteristics of the patients are given in Table 1.

Table 1: Characteristics of patients.

	Number (%)
Total number of patients	13
Male	6 (46)
Female	7 (54)
Mean age (years)	47.5±15
Mean dysphagia grade	3.4
Site of lesion	
Mid esophagus	9 (69)
Lower esophagus	4 (31)
Tumor histology	
Squamous cell carcinoma	10 (77)
Adenocarcinoma	3 (23)

SEMS placement was technically successful in all 13 patients (100%). Dilatation was needed in all patients. Swallowing was improved in 12 of 13 patients (92.3%). Mean dysphagia score before implantation was 3.4 which significantly improved to 1.07 after SEMS placement ($P<0.05$). Perforation occurred in 1 patient which was managed conservatively in cardiothoracic department. Two patients had their SEMS blocked, one because of tumor in-growth and the other due to food bolus impaction. Tumor in-growth was successfully managed by inserting another SEMS under endoscopic guidance while food bolus obstruction was cleared endoscopically. Stent misplacement occurred in one patient which was treated with restenting.

Table 2: Complications following SEMS placement.

Complication	Number (%)
Cough and foreign body sensation	2 (15.4)
GERD	5 (38.5)
Pain requiring narcotic analgesics	4 (31)
Stent block	2 (15.4)
Perforation	1 (7.7)
Misplacement	1 (7.7)

DISCUSSION

Esophageal cancer is the sixth leading cause of death from cancer worldwide.^{3,4} More than 50% of patients with esophageal cancer are not amenable to surgical excision at the time of diagnosis, either because of advanced disease or due to the presence of comorbid conditions.⁶ Dysphagia is the most common presenting symptom of this disease and leads to nutritional compromise, pain, and deterioration of quality of life. Palliation of dysphagia is the mainstay of treatment for such patients. Although plastic prostheses have been shown to be efficacious, gross dilatation of the tumor stenosis was necessary to enable the passage of these tubes. Consequently, the rate of gross esophageal rupture at the tumor site, as well as aspiration, reflux, pneumonia, and sepsis was high with a mortality rate of up to 42%.¹²⁻¹⁴ SEMS have recently been introduced to rectify this drawback.

Self-expanding metallic stents provide a substantial progress in the management of patients with inoperable carcinoma esophagus. SEMS are made up of an alloy; usually nitinol or stainless steel. They are deployed using endoscopic and/or fluoroscopic techniques and quickly restores esophageal patency and effectively relieves dysphagia.¹⁶

Self-expandable metallic stent (SEMS) placement has been widely accepted to be an effective option for palliation of the symptoms caused by malignant esophageal strictures. Several studies have reported excellent results in relief of dysphagia using SEMS, with a technical success rate of 100% and clinical success rate of 83% to 100%.¹⁷⁻²² Our study shows similar results with a technical success rate of 100% and relief of dysphagia in 92.3 % of patients. Mean dysphagia score significantly improved from 3.4 (pre-stent) to 1.07 (post-stent). Although SEMS are effective and easier to place, they are not without complications.

One of the main complications of metal stents is distal migration, with an incidence rate ranging between 10% and 30%.²³ It is more commonly (50%) seen when covered stents are used to treat distal esophageal lesions involving the gastroesophageal junction.^{24,25} In our study stent migration occurred in 7.7% patients which was managed successfully by inserting another stent.

Stents blockage is another problem with uncovered stents. It is due to tumor in-growth (17-36%) or overgrowth (10%) and food bolus obstruction leading to recurrence of dysphagia.^{26,27} Two of our patients blocked their stents (15.4%), one because of tumor in-growth and another due to food bolus impaction. Tumor in-growth was successfully managed by inserting another stent and food bolus was cleared endoscopically.

Perforation is more serious complication in patients with malignant dysphagia, and mortality rate is high. The incidence of perforations is more than 10% for plastic stents¹²⁻¹⁴ compared with less than 5% in SEMS.²⁸ This rate was 7.7% in our series probably due to our limited experience.

Hematemesis is also a possible complication after SEMS insertion.²⁹ It is due to pressure necrosis, the natural progress of the disease, or trauma from the sharp, uncovered end of the stent.³⁰ Although its incidence is reported to be up to 5%,³¹ none of our patients had hematemesis.

Chest pain is a common complaint following stent insertion, with a reported incidence of up to 100%.³² It is usually due to dilatation and stretching. In our study 31% patients complained of severe retro-sternal chest pain necessitating narcotic analgesics.

Regurgitation is a frequent complication of esophageal stenting and is more common in patients who undergo stenting for lesions in the lower esophagus (72%),³³ which was 38.5% in our series and was managed with Proton Pump Inhibitors. Other minor complications like foreign body sensation and cough were also seen in our patients.

CONCLUSION

SEMS insertion is an effective way of relieving dysphagia in patients with inoperable carcinoma esophagus but it is not without complications.

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