International Surgery Journal
Jain PK et al. Int Surg J. 2016 Nov;3(4):1757-1760
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20163511

Original Research Article

Safety of endoscopic self-expanding metallic stent placement in esophageal cancer without fluoroscopy

Parvesh Kumar Jain[1]*, Rajashekara Babu G.[2]

[1]Department of Medical Gastroenterology, [2]Department of General Surgery, Bangalore Medical College and Research Institute, Bangalore, Karnataka, India

Received: 23 September 2016
Accepted: 29 September 2016

***Correspondence:**
Dr. Parvesh Kumar Jain,
E-mail: jainpravesh1@rediffmail.com

ABSTRACT

Background: Esophageal self-expanding metal stent (SEMS) placement is traditionally done under fluoroscopic guidance. But few authors have shown that esophageal SEMS can be placed without fluoroscopy. The study aimed to assess the safety and success of SEMS placement in patients with carcinoma esophagus under endoscopic guidance without fluoroscopy.
Methods: All patients who underwent esophageal stenting for palliation of malignant dysphagia over a 4 year period were reviewed retrospectively. Consecutive patients were identified from the endoscopy report books and inpatient admission files of medical gastroenterology department, Victoria hospital. In one hundred and ten patients with inoperable carcinoma esophagus, SEMS was placed. The procedure consisted of proximal release SEMS insertion under endoscopic guidance without the use of fluoroscopy. They were followed at one week and one month after deployment. All the complications related to the procedure were recorded.
Results: 110 patients underwent endoscopic esophageal SEMS insertion for palliation of malignant dysphagia. Stent was successfully placed in all the patients. The mean age of patients was 57.38±21.21 years (range: 31 to 84 years). Dilatation of stricture before SEMS placement was needed in 33 patients (30%). No patient had esophageal perforation or stent migration.
Conclusions: Esophageal stent insertion in carcinoma esophagus under endoscopic guidance without fluoroscopy is successful, safe and effective for palliation of dysphagia.

Keywords: Dysphagia, Esophageal stent, Esophageal cancer, Self-expanding metallic stent

INTRODUCTION

The incidence of esophageal cancer in India is 4.1% (men - 5.7%, women - 2.7%).[1] It is the sixth common cancer in men and eighth common cancer in women in India.[2] Majority of patients with esophageal cancer are diagnosed at a late stage and only palliation is possible.[3]. Patients with esophageal cancer have a five year survival rate of 5-10%.[4] Dysphagia is the main symptom of esophageal cancer, causing weight loss and poor quality of life. Palliative treatment of dysphagia with self-expandable metal stent (SEMS) insertion is an effective and safe procedure.[5,6] SEMS insertion is associated with complications like perforation, bleeding, stent migration, tumor ingrowth and stent occlusion.[7]

In majority of previous studies, endoscopic SEMS insertion was done under fluoroscopic guidance.[8,9] However few studies have demonstrated that SEMS can be safely inserted under endoscopic guidance alone without fluoroscopy.[10-15] This method of SEMS insertion is important in centers where fluoroscopy is not available.

Also medical staffs are protected from repetitive exposure to X-rays. The aim of this study was to describe experience of endoscopic SEMS insertion in esophageal cancer patients without the use of fluoroscopy.

METHODS

From April 2012 to March 2016, consecutive patients with esophageal cancer undergoing esophageal SEMS insertion for palliation of dysphagia were included in the study. Patients were identified from the endoscopy report books and inpatient admission files of medical gastroenterology department, Victoria hospital, attached to Bangalore medical college and research institute, Bangalore, India.

Inclusion criteria

- Patients with dysphagia due to advanced esophageal cancer deemed inoperable by oncosurgeon
- Patients with dysphagia due to esophageal cancer deemed unsuitable for surgery due to age or other comorbid conditions.

Exclusion criteria

- Patients with proximal location of tumor where SEMS placement was not possible
- Patients with multiple non-contiguous esophageal tumors
- Previous gastric or esophageal surgery.

Baseline dysphagia score was recorded according to Atkinsons score: grade 0 - ability to eat normal food; grade 1- ability to eat some solid food; grade 2- ability to eat some semi-solids only; grade 3 - ability to swallow liquids only; grade 4- complete dysphagia.[7] Informed consent was taken from all the patients. The study was approved by the institutional ethics committee.

Patients underwent esophageal stenting under conscious sedation. In left lateral position, adult gastroscope was passed into the esophagus and across the tumor into the stomach. If endoscopist was unable to pass adult endoscope across the tumor, the scope was removed and a pediatric flexible gastroscope was inserted and passed across the tumor into stomach. Once the endoscope is in the stomach a guidewire (Hydra Jagwire, 260 cms length, 0.038 inch diameter, Boston Scientific, Natick, Massachusetts) was inserted into the antrum and the scope was pulled back slowly, recording the tumor length and its proximal extension. Stricture dilatation with Savary-Gilliard dilators up to 9 mm were carried out if necessary, when stricture was considered too tight by the endoscopist. The esophageal SEMS were selected with length at least 4 cms longer than the stricture. Esophageal SEMS was then introduced over the guidewire. The gastroscope was reintroduced alongside the stent and SEMS was deployed under endoscopic vision. All the stents were partially covered proximal release stents (ultraflex esophageal stent; Boston Scientific, Natick, Massachusetts). Repeat endoscopy was done after 24 hours to confirm the position of the stent. After that patients were started on soft diet. All patients were followed in the outpatient department at one week after deployment. Patients were questioned regarding dysphagia on follow-up visit.

The data were analysed in statistical program SPSS 16. Numerical parameters i.e. age, duration of dysphagia and dysphagia score were expressed as mean + standard deviation. Complications were presented as frequencies and percentage.

RESULTS

Endoscopic SEMS insertion was done in 110 patients over a period of 4 years. The mean age of patients was 57.38±21.21 years (range: 31 to 84 years). Sixty two (56%) patients were male. Mean tumor length was 7.5±3.0 cm (range 3-12 cms). The tumor was located in upper esophagus in 33 patients (30%), mid-esophagus in 55 patients (50%) and lower esophagus in 22 patients (20%) (Table 1).

Table 1: Baseline characteristics of study patients.

Characteristics	Median (min-max)
Age	57.38 (31 to 84)
Number of male (%)	62 (56%)
Tumor size (cm)	7.5 (3-12)
Tumor localization	
Proximal (%)	33 (30%)
Middle (%)	55 (50%)
Distal (%)	22 (20%)

SEMS was placed successfully in all the 110 patients under endoscopic control alone. Dilatation of stricture before SEMS placement was needed in 33 patients (30%). In these patients endoscopist was able to cross the stricture with pediatric gastroscope with difficulty. In 99 (90%) patients we were able to place the SEMS 2 cms-3cms above the upper end of the tumor. In 11 (10%) patients with upper esophageal tumor, SEMS was placed at the level of the proximal end of the tumor.

All the stents used were proximal release partially covered self-expanding ultra-flex stents (Boston Scientific). Lengths of the stents used were: 10cms in 20 patients (18.2%), 12 cms in 60 patients (54.5%) and 15cms in 30 patients (27.3%). Stent with 23 mm luminal diameter was used when the stent was placed across GE junction (33 patients). All other patients had stents with luminal diameter of 20 mm (77 patients).

Early complications included severe retrosternal pain requiring analgesia, vomiting, and hemetemesis. All were treated conservatively in the wards. No patient had perforation or stridor due to tracheal compression or

death during the procedure. Gastroscopy performed after 24 hours of procedure did not reveal any stent migration.

DISCUSSION

Traditionally esophageal SEMS placement is done by endoscopy under fluoroscopic guidance. Recently many authors have demonstrated that endoscopic insertion of esophageal SEMS without fluoroscopy is safe and effective in esophageal malignancy.[10-15] Fluoroscopy is required to guide placement of wire across the stricture into stomach, to mark the upper and lower ends of the stricture with radio-opaque markers and for SEMS positioning during deployment. In present study, it was showed that esophageal SEMS insertion under endoscopic guidance without fluoroscopy is simple, safe and effective. In the study the endoscope (adult or paediatric) across the stricture in all the patients were passed, so were able to place guidewire safely into the stomach. Also we were able to measure the exact length of the tumor and selected the SEMS accordingly. We used proximal release stents, so were able to control/adjust positioning till full deployment. Also radiation exposure due to fluoroscopy was avoided.

Table 2 shows the comparison of our study with previous studies on esophageal SEMS placement without fluoroscopy. Success rate of stent placement ranges from 77% to 100%. We were able to place stent successfully in all the patients. In present study, no patient had stent migration, while the reported incidence of stent migration ranges from 3% to 18%. We did not encounter any perforation related to procedure. Various studies have reported perforation rate of 0% to 5%. In present study 20% patients had severe retrosternal pain post-stenting, which is similar to previous studies. Paediatric gastroscope was used, to cross the stricture, when were unable to pass adult gastroscope across the stricture. So we were able to place guidewire into stomach in all the patients. Hence, we successfully placed SEMS in all the patients. The stricture was not dilate in all the patients. Dilatation was done, only when stricture was too tight. Also dilatation was done only up to 9 mm, which was sufficient to pass ultraflex stent delivery system (7 mm) across the stricture. As stents which cross gastro-esophageal (GE) junction are more likely to migrate, we used large diameter stents (23 mm) in patients where stent was put across the GE junction. We were able to reduce stent migration rate by doing minimal dilatation and using large diameter stents when the stent was placed across GE junction.

Major limitations of the study were retrospective data collection and short duration of follow-up, so that tumor in-growth, late migration and long term palliation could not be assessed. However our major aim was to evaluate the success and procedure related complications associated with stent insertion without fluoroscopy.

CONCLUSION

Technique of endoscopic guided insertion of esophageal SEMS without fluoroscopy is safe and accurate method of placement of esophageal stent. This technique avoids exposure to X-rays. More and more endoscopists should use this technique of stent insertion without fluoroscopy, which is safe and effective for palliation of malignant dysphagia and also saves endoscopy staff from harmful effects of radiation exposure.

Table 2: Success and complication rates reported in the literature.

Author	n	Type of stent	Success rate	Complications
Current study	110	Ultra-flex with proximal release	100%	22 retrosternal pain 6 hemetemesis
White RE et al[10]	70	Wall stent/ ultra-flex Distal or proximal release	100%	2 perforations 2 tumor in-growth 1 tumor overgrowth
Austin AS et al[11]	30	Ultra-flex with Proximal release	77%	No complications
Ben Soussan et al[12]	33	Ultra-flex with proximal release	90%	1 death (pulmonary embolism) 2 severe retrosternal pain 5 obstruction of stent 1 esophago-respiratory fistula
Wilkes EA et al[13]	98	Ultra-flex with proximal release	92%	25 tumor overgrowth 6 hemorrhage 5 tracheoesophageal fistula
Siddiqui AA et al[14]	80	Distal release	93.75%	4 upper GI bleeding 4 aspiration 30 retrosternal pain
Tahiri M et al[15]	47	Wall flex and evolution stent Distal release	100%	4 tumor overgrowth

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the institutional ethics committee

REFERENCES

1. Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, et al. GLOBOCAN 2012 v1.0, Cancer Incidence and Mortality Worldwide: IARC Cancer Base. Lyon, France: International Agency for Research on Cancer; 2013. Available at http://globocan.iarc.fr. Accessed on 15 May 2016.
2. Bray F, Ren JS, Masuyer E, Ferlay J. Estimates of global cancer prevalence for 27 sites in the adult population in 2008. Int J Cancer. 2013;132(5):1133-45.
3. Diamantis G, Scarpa M, Bocus P. Quality of life in patients with esophageal stenting for the palliation of malignant dysphagia. World J Gastroenterol. 2011;17:144-50.
4. Kubba AK, Krasner N. An update in the palliative management of malignant dysphagia. Eur J Surg Oncol. 2000;26:116-29.
5. Siersema PD, Dees J, Blankenstein M. Paliation of malignant dysphagia from esophageal cancer. rotterdam oesophageal tumor study group. Scand J Gastroenterol Suppl. 1998;225:75-84.
6. Cowling MG, Hale H, Grundy A. Management of malignant esophageal obstruction with self-expending metal stents. Br J Surg. 1998;85:264-6.
7. Morgan JL, Khan HN, Lambertz MM. Oesophageal stenting in a district general hospital. Surgeon. 2009;7:203-5.
8. Ogilvie AL, Dronfield MW, Ferguson R, Atkinson M. Palliative intubation of oesophagogastric neoplasm at fibreoptic endoscopy. Gut. 1982;23:1060-7.
9. Ghazanfar S, Qureshi S, Tariq F, Niaz SK, Quraishy MS. Palliative management of irresectable carcinoma esophagus using self-expandable metallic stents (SEMS). J Pak Med Assoc. 2009;59:437-40.
10. White RE, Mungatana C, Topazian M. esophageal stent placement without fluoroscopy. Gastrointest Endosc 2001;53:348-51.
11. Austin AS, Khan Z, Cole AT, Freeman JG. Placement of esophageal self-expanding metallic stents without fluoroscopy. Gastrointest Endosc. 2001;54:357-9.
12. Soussan BE, Antonietti M, Lecleire S, Savoye G, Fiore F, Paillot B, et al. Palliative esophageal stent placement using endoscopic guidance without fluoroscopy. Gastroenterol Clin Biol. 2005;29:785-8.
13. Wilkes EA, Jackson LM, Cole AT, Freeman JG, Goddard AF. Insertion of expandable metallic stents in esophageal cancer without fluoroscopy is safe and effective: a 5-year experience. Gastrointest Endosc. 2007;65:923-9.
14. Siddiqui AA, Ansari S, Ghouri MA, Memon MS. Self expandible metallic stent endoscopic insertion in esophageal cancer. J Pak Med Assoc. 2010;20(8):502-5.
15. Tahiri M, Ferraro P, Duranceau A, Berthiaume M, Thiffault V, Liberman M. Self-expanding metallic stent placement with an exaggerated 5-cm proximal tumor covering for palliation of esophageal cancer. Annals Gastroenterol. 2015;28:347-52.

Cite this article as: Jain PK, Babu RG. Safety of endoscopic self-expanding metallic stent placement in esophageal cancer without fluoroscopy. Int Surg J 2016;3:1757-60.