Gastric ulceration following oesophageal stent migration complicating surgical management of oesophageal cancer

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Abstract

Oesophageal, fully covered self-expanding metal stents (SEMS) allow palliation of dysphagia so as to support nutrition during neoadjuvant therapy. We present a 68-year old man with an oesophageal adenocarcinoma (T3N1M0) who had a fully covered oesophageal SEMS placed prior to neoadjuvant chemoradiotherapy. Repeat endoscopy 8 weeks later (for stent removal) showed that the stent had migrated and impacted upon the greater curvature of the stomach with a resultant ulcer. Surgery was delayed and, 10 weeks following the cessation of neoadjuvant chemoradiotherapy, this patient underwent a right thoracoabdominal oesophagogastrectomy. Operative findings included an erosion of the stent-induced gastric ulcer into the body of the pancreas and showed that the ulcerated tumour had become adherent to the thoracic aorta. This report demonstrates that the complications of stent migration can significantly impact upon surgical resection at multiple levels and provides a case for the routine removal of stents used in the neoadjuvant setting.

Keywords: Oesophageal stent · Migration · Neoadjuvant · Chemoradiotherapy

INTRODUCTION

Recent studies have shown an improved survival associated with the use of neoadjuvant chemoradiotherapy prior to surgical resection of oesophageal malignancy [1]. A significant proportion of patients with locally advanced oesophageal cancer will require palliation of dysphagia so as to support nutrition during neoadjuvant therapy. Oesophageal, fully covered self-expanding metal stents (SEMS) represent an attractive modality for meeting these requirements with the benefits of minimally invasive placement [2] and easy removability. Stents are not without complications, including local erosion with fistula formation and migration. Stent migration is a well-described complication associated with SEMS, we describe an example of the significant consequences of stent migration during neoadjuvant chemoradiotherapy for oesophageal malignancy, which ultimately impacted both the timing and approach of surgical resection.

CASE REPORT

A 68-year old male presented with 6 months of dysphagia and 50 lbs weight loss. His medical history included prostate carcinoma and chronic renal insufficiency. Upper endoscopy (EGD) revealed an exophytic circumferential mass at 36 cm from the incisors and biopsies confirmed a signet ring adenocarcinoma. Subsequent staging with endoscopic ultrasound, PET and CT suggested T3N1M0 disease. Following discussion by a multidisciplinary tumour board, a fully covered oesophageal SEMS was placed (23 mm × 12 cm Wallflex, Boston Scientific, Natick, MA, USA) and neoadjuvant chemoradiation (5040 rad and Cisplatin 5FU) was initiated. The patient tolerated the stent placement well and an immediate ability to resume a soft regular diet was noted.

Despite the improvement in dysphagia following the oesophageal SEMS placement, this patient continued to lose weight during the neoadjuvant chemoradiotherapy due to poor appetite, losing an additional 30 lbs prior to the surgery. Repeat endoscopy 8 weeks later (for stent removal) following the completion of the neoadjuvant chemoradiotherapy revealed that the stent had partially migrated into the stomach with the distal end impacted upon the greater curvature (Fig. 1) creating a deep 2–3 cm ulcer; biopsies taken of the ulcer were benign. Surgery was delayed to allow sufficient time for the gastric ulcer to heal. However, despite the stent removal and high-dose proton-pump inhibitors, subsequent endoscopies over the next 8 weeks demonstrated no healing of the ulcer. The patient’s preoperative course was additionally complicated by a left lower leg deep vein thrombosis for which he was anticoagulated prior to surgery.

Optimal management would target surgery within 4–6 weeks after completion of neoadjuvant therapy; this patient underwent a right thoracoabdominal oesophagogastrectomy 10 weeks following neoadjuvant therapy. Operative findings included an erosion of the stent-induced gastric ulcer into the body of the pancreas, with no discernable tissue plane to allow dissection. A portion of the gastric wall was left attached to the pancreas (Fig. 2), and the ulcer was over-sewn. In addition, the location of the ulcer necessitated the use of the anterior stomach wall instead of the greater curve to fashion the conduit. The oesophageal tumour had also become ulcerated and was adherent to the thoracic aorta at the upper level of the migrated stent.
necessitating leaving the base of the ulcer attached to the aortic wall (biopsies were negative for tumour). The final pathologic staging was T0N1M0. This patient had an uneventful postoperative recovery and was discharged on day 7 following his oesophagogastrectomy and, at the 6-month follow-up, this gentleman remains well.

**DISCUSSION**

In the recent CROSS study, the survival benefit incurred through the use of neoadjuvant chemoradiotherapy in the treatment of resectable oesophageal malignancy has been clearly demonstrated (at a median follow-up of 32 months, the 3-year survival rate was 59% in patients who received chemoradiotherapy and surgery vs. 48% in patients who received surgery alone) [1]. A large proportion of patients with locally invasive oesophageal malignancy will present with dysphagia and weight loss. Neoadjuvant chemoradiotherapy increases the time to surgery and can produce toxic side effects, including nausea, decreased appetite and odynophagia due to mucositis or oesophagitis, which together contribute to malnutrition in patients awaiting surgical resection. Furthermore, poor nutritional status has previously been well correlated with adverse clinical outcome following oesophagectomy [3].

Previous studies have shown the benefits associated with oesophageal stent placement during neoadjuvant therapy, which include palliation of dysphagia, reduced rate of interruption of chemoradiotherapy and improved nutritional status (weight and serum albumin) [4]. Despite these benefits, fully covered oesophageal SEMS are associated with an increased risk (6–43.8%) of migration due to the lack of tumour ingrowth or granulation tissue to stabilize the endoprosthesis [5]. Response to neoadjuvant chemoradiotherapy often results in tumour shrinkage, which can be a contributing issue associated with distal migration. Stent migration into the stomach is often tolerated without significant problems. However, the current case highlights that migration can be associated with significant ulceration and erosion, which will not only impact resection but, in some cases, could impact resectability. We are currently recommending scheduled stent removal 2–3 weeks following initiating neoadjuvant therapy and immediate stent removal or repositioning at any time migration is recognized. Maintaining the nutritional balance during neoadjuvant therapy is an issue that requires routine review by the tumour board.

Prospective trials assessing the ultimate place of SEMS in patients having neoadjuvant therapy, especially in comparison with surgical jejunostomy, are needed to validate their regular application. This case clearly highlights the potential consequences of stent migration and the requirement for the future development of oesophageal stents that adequately palliate dysphagia, are easily removable and have alternative methods of fixation to decrease migration.

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**REFERENCES**


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**Figure 1:** Fluoroscopic image showing migration of the oesophageal stent with impaction upon the greater curvature of the stomach.

**Figure 2:** (A) Intraoperative image of the stomach adhered onto the pancreas due to erosion of the posterior gastric ulcer into the body of the pancreas. (B) Intraoperative image with the stomach removed, but with a portion of the posterior gastric wall left attached.
eComment. Re: Gastric ulceration following oesophageal stent migration

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Markar and colleagues have highlighted the potential problems of stent migration during neoadjuvant therapy which caused severe problems during open resection for oesophageal cancer [1]. In their case the in-situ stent made the oesophageal dissection planes more difficult and caused a severe and penetrating gastric ulceration affecting the timing of oesophagectomy and making the gastric conduit more difficult to construct. Even without significant stent migration, severe complications can still occur [2, 3]. To mitigate these possibilities, Markar et al. suggest that metallic stents should be routinely removed a few weeks after neoadjuvant therapy. However, we feel there are sufficient concerns regarding the use of stents in patients with potentially curable oesophageal cancer to make a case for their complete avoidance:

1) As eluded to by the authors the migration rate is excessive when neoadjuvant chemotherapy or chemoradiotherapy is used. At best, if migration into the stomach occurs, this can be easily removed at oesophagectomy. However, migration into the small bowel may require emergency removal to prevent or treat small bowel perforation. Even a planned removal at endoscopy would be a substantial inconvenience for a patient undergoing radical oncological therapy.

2) If removal is not performed or not possible due to tumour tissue ingrowth, other authors have reported difficulties with oesophageal resection due to disruption of the normal tissue planes [2]. Christie et al. reported two severe problems out of 16 patients who had stents inserted during neoadjuvant therapy [2]. One patient had stent erosion into the vertebral body, which made surgery much more difficult. In the other patient a mediastinal abscess occurred due to an occult perforation caused by the stent. This led to recurrent mediastinal sepsis after surgery and this patient eventually died. Langer et al. reported five serious complications in 38 patients who had stent insertion prior to neoadjuvant therapy and oesophagectomy [3]. These were two oesophago-tracheobronchial fistulae, one acute oesophageal perforation, one small bowel perforation and one erosion of the aortic wall.

3) The resectability and curability rates in some studies which have used stents prior to planned oesophagectomy have been low. This could be due to the advanced nature of the obstructing tumours in these series but another explanation could be the compressive action of the stent into the mediastinum leading to more disease invasion and metastatic spread in addition to more difficult resection.

Previous randomized studies in palliative oesophageal cancer reported worse survival rates in patients treated with metallic stents compared with non-stent palliation, such as thermal ablation [4]. Interesting data for colorectal cancer shows that stent insertion increases the number of viable tumour cells in the circulation post procedure [5], however this has never been tested in oesophageal cancer.

Alternative options to tackle dysphagia in a potentially resectable patient include nasojejunal feeding, surgical feeding jejunostomy, removable metallic or plastic stents or even newer biodegradable stents. Ideally these would be assessed in randomized controlled studies comparing complications, rates of resectability, final oncological stage and survival as well as quality of life indicators.

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References