CardioVascular and Interventional Radiology


Published Online: 8 November 2001

Cardiovasc Intervent Radiol (2001) 24:443–444
DOI: 10.1007/s00270-001-0065-z

# Fatal Hemorrhage in Stented Esophageal Carcinoma: Tumor Necrosis of the Aorta

Colette Kennedy,[1] Adrian Steger[2]

[1]Department of Radiology, University Hospital Lewisham, London SE13 6LH, UK
[2]Department of Surgery, University Hospital Lewisham, London SE13 6LH, UK

## Abstract

We report a case of fatal hematemesis in a patient with an esophageal stent for palliation of malignant dysphagia. Post-mortem examination showed tumor thrombi in the vasa vasorum of the aorta causing aortic wall necrosis and perforation. Massive delayed hemorrhage is reported as a complication of metallic esophageal endoprostheses but in the majority of cases there have been no post-mortem examinations. In this case the post-mortem examination demonstrated that the cause of death was not stent-related. We feel that this case report adds important information to the current literature regarding the delayed complications seen in patients with esophageal carcinoma who have been palliated with metallic stents.

**Key words:** Eesophageal carcinoma—Metallic stent—Fatal hemorrhage—Non-stent-related death—Complications—Aorta—Esophageal fistula

Metallic stents have a well-established role in the palliative management of esophageal carcinoma [1–8]. Complications following stent insertion vary depending on the location of the obstruction and the type of endoprosthesis used. Grundy and Glees [9] extensively reviewed the literature and suggested that in patients with esophageal stents there may be an association between the risk of esophageal erosion and perforation, and previous chemotherapy and radiotherapy.

There have been over 20 reported cases of hemorrhage in the literature [1–11], of which the majority have been fatal. In these cases bleeding was seen endoscopically from the tumor or from the esophagus at the site of the stent. In most there was no correlation with post-mortem findings. Grundy et al. [9] reported erosion of the upper end of the stent into the esophageal wall and then into the aorta with fatal hematemesis. We describe a patient with esophageal carcinoma, initially treated with chemotherapy and subsequently with insertion of a metal stent for recurrent dysphagia, who had a fatal hematemesis that was shown on post-mortem examination not to be related to the stent.

## Case Report

A 71-year-old man presented with dysphagia, upper abdominal pain and weight loss. Endoscopy revealed a polypoid lesion on the posterior wall of the esophagus at 27 cm, which on biopsy was shown to be a poorly differentiated adenocarcinoma. He received five courses of chemotherapy (mitomycin, cisplatin and infusional 5-fluorouracil) but was unable to have a final sixth course due to persisting myelosuppression. He responded clinically and a follow-up CT scan showed tumor regression. A repeat biopsy at 6 months showed cellular and glandular atypia but no evidence of malignancy. However, 4 months later he complained of recurrent dysphagia. As he declined surgery it was felt that insertion of an esophageal stent would provide the best palliative care. A 110 mm long, 25 mm diameter, part-covered, esophageal Wallstent (Boston Scientific, Watertown, MA, USA) was inserted under fluoroscopic guidance with good symptomatic relief.

Over the following 3 months he remained well with no dysphagia. He then presented acutely to the A&E department with moderate hematemesis and hemoptysis. A chest radiograph (Fig. 1) showed the esophageal stent to be unchanged in position in the upper and mid-oesophagus and a large right pleural effusion. Six hours later he had a massive fatal hematemesis.

Post-mortem examination revealed a nodular esophageal mucosa but no grossly visible tumor. On histologic sections moderately differentiated adenocarcinoma was seen in the muscle layer of the esophagus, between the esophagus and the aorta, and extending into the submucosa of the trachea. Tumor thrombi were occluding the vasa vasorum of the aortic wall, which showed necrosis and perforation (Fig. 2). The proximal and distal ends of the stent were distant to the site of perforation, which was in the mid-esophagus.

## Discussion

Hemorrhage in patients palliated with metallic esophageal stents has been described in the literature [1–11]. Bleeding has been reported to occur either from the tumor abutting the stent, from the esophagus at the edges of the stent, from the stomach following distal migration of the stent, or erosion into the aorta causing an aorto-esophageal fistula. It is not clear in all these patients whether they had received prior chemotherapy or radiotherapy. Similarly most patients did not have a post-mortem examination and detailed histologic evidence is lacking.

Following review of the current literature Grundy and Glees [9] imply an incidence of hemorrhage in 8% of patients following stent insertion and radiotherapy. There are no studies on whether radiotherapy or chemotherapy really does increase the incidence of complications, especially fatal hemorrhage. However, an impression has now developed that fatal hematemesis is a complication of expanding metal stents. This was not the case with rigid plastic stents. However, such hematemesis is described as a complication of esophageal carcinoma [12].

In this case progressive tumor growth with extension into the vasa vasorum caused thrombosis and necrosis of the aortic wall,

*Correspondence to:* Dr. C. Kennedy; tel: +44 (0)20 8333 3000, fax: +44 (0)20 8314 5461

Fig. 1. Chest radiograph on admission showing the esophageal stent and a large right pleural effusion.

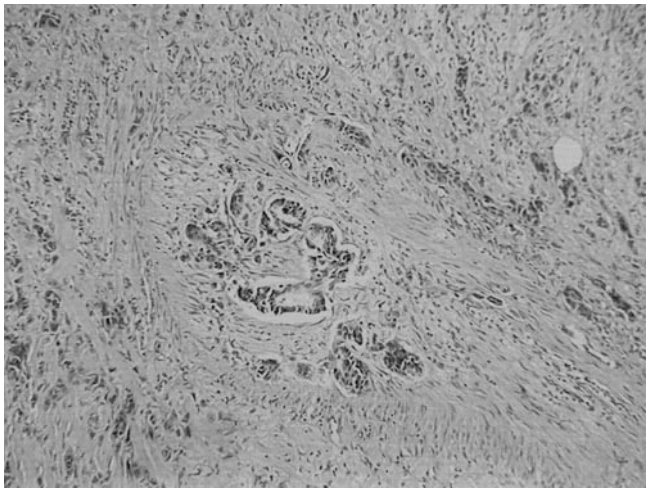

Fig. 2. High-power photomicrograph showing adenocarcinoma infiltrating and occluding the vasa vasorum of the aortic adventitia.

and subsequently an aorto-esophageal fistula. Although the presence of the stent means that pressure necrosis may be an etiologic factor, histologic examination confirmed the diffuse infiltrative nature of the tumor. Without information from post-mortem examinations, the reasons for fatal hemorrhage in patients with metal self-expanding esophageal stents remain unknown. There is potential for confusion and the risk of ascribing to the stent the cause of a fatal hematemesis in esophageal cancer with a stent in place, when it may be part of the natural history of the disease. Patients with esophageal cancer who are not undergoing surgery are surviving longer with the combination treatment of stents and chemotherapy, so this complication may be seen more often. There is a need for more post-mortem examinations in these patients to establish whether the fatal hemorrhage was secondary to stent damage to the esophageal wall or due to the underlying tumor or a combination of the two.

Esophageal stents have a valuable role in the palliation of malignant dysphagia and it would be unfortunate if they were incorrectly implicated in a high incidence of fatal hemorrhage.

*Acknowledgment.* We thank Dr. Andrew Giles, Consultant Pathologist, University Hospital Lewisham, for his help with the pathology and for the photomicrographs.

## References

1. O'Sullivan GJ, Grundy A (1999) Palliation of malignant dysphagia with expanding metallic stents. J Vasc Interv Radiol 10:346–351
2. Clements WD, Johnston LR, McIlwrath E, Spence RA, McGuigan J (1996) Self-expanding stents for malignant dysphagia. J R Soc Med 89:454–456
3. Cwikiel W, Stridbeck H, Tranberg KG, Steal von Holstein C, Hambreaus G, Lillo-Gil R (1993) Malignant esophageal strictures: Treatment with a self-expanding nitinol stent. Radiology 187:661–665
4. Ellul JP, Watkinson A, Khan RJ, Adam A, Mason RC (1995) Self-expanding metal stents for the palliation of dysphagia due to inoperable esophageal carcinoma. Br J Surg 82:1678–1681
5. Miyayama S, Matsui O, Kadoya M, Yoshikawa J, Gabata T, Kitagawa K, Arai K, Takashima T (1995) Malignant esophageal stricture and fistula: Palliative treatment with polyurethane-covered Gianturco stent. J Vasc Interv Radiol 6:243–248
6. Song HY, Do YS, Han YM, Sung KB, Choi KY, Sohn KY, Kim HR, Kim SH, Min YI (1994) Covered, expandable esophageal metallic stent tubes: Experience in 119 patients. Radiology 193:689–695
7. Watkinson AF, Ellul J, Entwisle K, Mason RC, Adam A (1995) Esophageal carcinoma: Initial results of palliative treatment with covered self-expanding endoprosthesis. Radiology 195:821–827
8. Adam A, Watkinson AF, Dussek J (1995) Boerhaave syndrome: To treat or not to treat by means of insertion of a metallic stent? J Vasc Interv Radiol 6:741–746
9. Grundy A, Glees JP (1997) Aorto-esophageal fistula: A complication of esophageal stenting. Br J Radiol 70:846–849
10. Saxon RR, Barton RE, Rosch J (1994) Complications of esophageal stenting and balloon dilatation. Semin Interv Radiol 11:276–282
11. McCray RS (1997) Endoscopic palliation of malignant dysphagia. N Engl J Med 336:294–282
12. Bouchier IAD, Allen RN, Hodgson HJF, Keighley MRB (1993) Gastroenterology: Clinical science and practice, 2nd ed. WB Saunders, Philadelphia