

## Adenocarcinoma arising in an oesophageal colonic interposition graft

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### Abstract

This case report describes the rare complication of an adenocarcinoma developing in a colonic interposition graft 20 years following surgical resection of a postcricoid squamous carcinoma. A free jejunal graft was used for further oesophageal reconstruction following resection of the colonic graft.

**Key words:** Adenocarcinoma; Colonic interposition graft

### Case report

A 75-year-old woman presented with a two-month history of progressive dysphagia. Twenty years previously she underwent pharyngolaryngectomy for a postcricoid squamous cell carcinoma (Figure 1; from biopsy of original tumour). Reconstruction was then achieved using a subcutaneous right colonic interposition graft based on the right branch of the upper left colic artery. After initial post-operative problems with hypocalcaemia she remained well on regular follow-up. Seven and 19 years after surgery she was investigated for episodes of dysphagia, which were treated with good effect by dilatation, being symptom free in the intervening periods. There was no other history of note, in particular no known history of inflammatory bowel disease or family history of colorectal neoplasia.

Investigation showed a tight structure at the upper part of the colonic graft with a luminal diameter of 1 mm (Figure 2). Biopsies and brushings were obtained by flexible endoscopy on two occasions. There were four biopsies in the first sample and eight in the second sample. The first set showed areas of low grade dysplasia, high grade dysplasia and foci representing intramucosal adenocarcinoma and the second set confirmed these findings (Figure 3). The first cytological specimen contained little cellular material but this included several groups of anaplastic malignant cells. The second cytological specimen contained a higher cell yield with sheets of columnar cells showing a spectrum of nuclear abnormalities ranging from mild regenerative changes to severe changes indistinguishable from carcinoma, as seen in the previous specimen. The combination of the biopsies and cytology indicated carcinoma, possibly an early cancer at the site of the stricture, with features of adenocarcinoma indicating the development of a new tumour rather than recurrence of the previous squamous carcinoma.

The upper part of the colonic graft was resected and continuity restored using a free jejunal graft anastomosed proximally to the pharynx and distally to the colonic graft remnant. The mesenteric pedicle was anastomosed to the external carotid artery and the internal jugular vein using microvascular techniques.

The resected specimen measured 9.5 cm long with the surrounding fat and hypertrophic muscle together measuring up to 4 cm in diameter. There was extensive mucosal ulceration in a longitudinal orientation but no tumour mass was evident grossly. The whole specimen was blocked out and processed routinely. Multiple sections showed a spectrum of changes ranging from low grade dysplasia to foci of early adenocarcinoma, limited to small foci only, extending into the submucosa at the deepest point of invasion (Figures 4 and 5), the equivalent of a Dukes' stage A carcinoma if the bowel had been in its original site. These areas were clearly delineated using immu-

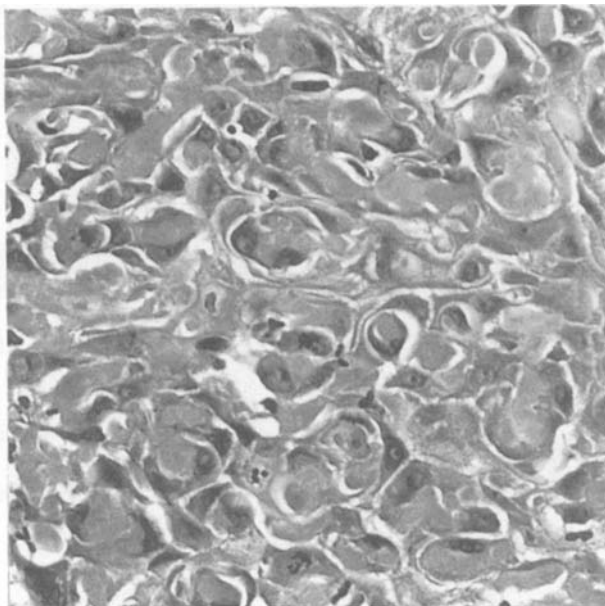


FIG. 1

Biopsy of original postcricoid tumour showing infiltrating squamous carcinoma. (H & E; ×135).

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FIG. 2

Barium swallow X-ray showing tight stricture at the upper end of the colonic graft.

nohistology (Figure 5). There were also areas of extensive ulceration. Inflammatory changes were slight and away from the ulcers. The submucosa showed fibrosis with neural hypertrophy associated with irregular thickening of the muscularis mucosae. There was hypertrophy of the muscularis propria with areas of disruption and fibrosis. No lymph node involvement was identified. The resection margins showed no evidence of tumour infiltration but the lower margin showed extensive ulceration.

The patient made a good post-operative recovery and regained her swallowing function within a week. She was well on initial follow-up.

### Discussion

Colonic grafts have been used in the treatment of both benign

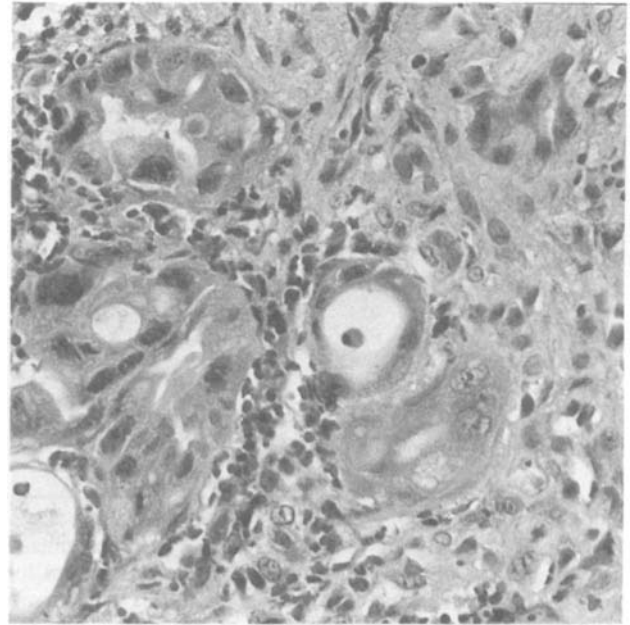


FIG. 3

Biopsy from stricture showing small focus of invasive adenocarcinoma. (H & E;  $\times 330$ ).

and malignant oesophageal strictures. The interposed colon may provide a durable conduit but long-term survival is unusual in patients with malignant tumours due to the risk of recurrence of the original tumour (Isolaurei *et al.*, 1991). Early post-operative complications are common (Larson *et al.*, 1985) and usually due to ischaemia causing a spectrum of changes from mucosal oedema to full thickness infarction, anastomotic leaks and fistula formation. The upper end of the graft is most vulnerable. Healing of acute ischaemic damage may result in stricture formation. Late complications are rarer but reported cases include peptic ulceration with perforation (Malcolm, 1968), colopericardial fistula (Isolaurei and Markkula, 1991) and colobronchial fistula (Perlmutter *et al.*, 1984).

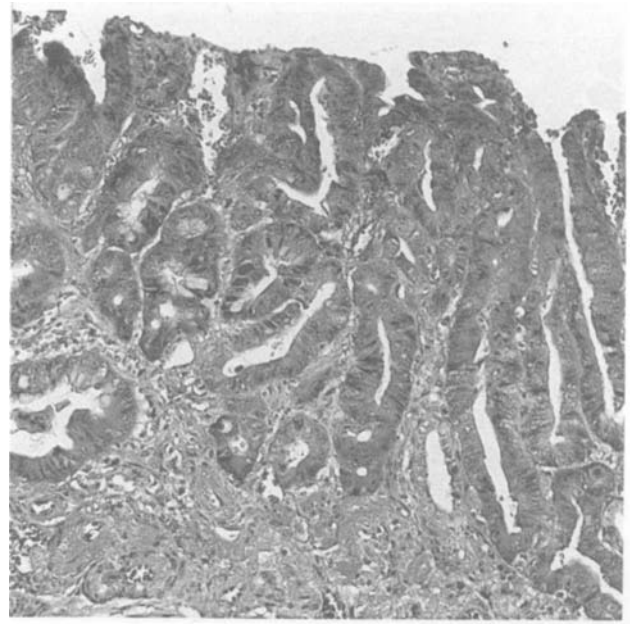


FIG. 4

Resected colonic graft showing flat adenomatous dysplasia with crowded distorted glands lined by atypical epithelium. (H & E;  $\times 135$ ).

TABLE I  
OTHER CASES OF ADENOCARCINOMA ARISING IN COLONIC INTERPOSITION GRAFTS

Author	Age	Sex	Original disease	Time since graft (years)	Details
Goldsmith and Beattie, 1968	48	Female	Squamous carcinoma in oesophagus	2	Polyp on barium swallow in distal graft. Adenocarcinoma invading muscle, said to be in a villous tumour.
Licata <i>et al.</i> , 1978	51	Male	Stricture following lye	1.5	Mass in colonic interposition, eroded sternum with metastases in lungs, peritoneum, ribs and vertebrae.
Haerr <i>et al.</i> , 1987	72	Male	Squamous carcinoma in oesophagus	7	Tight stricture at upper oesophagus with circumferential ulcerated adenocarcinoma, proximal to distal anastomosis, eroding sternum. Died with metastatic tumour deposits. 1 year later.
Houghton <i>et al.</i> , 1989	64	Male	Benign	20	Dukes' A carcinoma growing into oesophageal remnant.

Primary carcinomas have been recorded in the reconstructed oesophagus but predominantly when the stomach is used for reconstruction (Akiyama and Nakayama, 1982). Our case demonstrates the rare development of an adenocarcinoma arising *de novo* within a colonic graft. To our knowledge only four cases have been reported previously (Table I). In both cases where the patients died from disseminated tumour there was some delay in the diagnosis as initial contrast studies of the grafts failed to demonstrate the tumours and the diagnosis was only established later when endoscopies were performed (Licata *et al.*, 1978; Haerr *et al.*, 1987). In the other two cases the tumours were successfully resected and further reconstructions were achieved with gastric interposition (Houghton *et al.*, 1989) and the creation of a new cologastrostomy (Goldsmith and Beattie, 1968). Our case also shows an early invasive carcinoma with an additional feature not previously noted i.e. of arising within flat adenomatous dysplasia rather than a polyp within the colonic graft. It is interesting that the patient had a history of dysphagia over many years as it is generally recognized that carcinoma can be a complication of oesophageal strictures e.g. following the ingestion of lye.

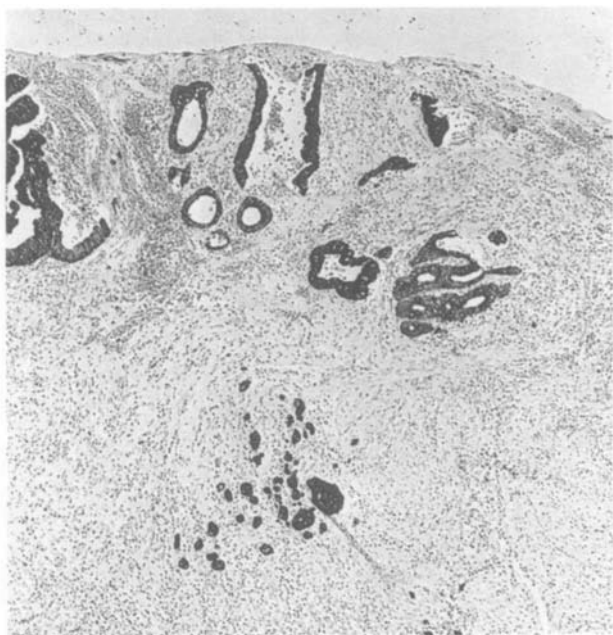


FIG. 5

Resected colonic graft showing invasive adenocarcinoma penetrating the muscularis mucosa. (Immunoperoxidase staining for cytokeratin;  $\times 55$ ).

The late development of dysphagia in a patient with a colonic interposition graft should always be taken seriously and thoroughly investigated. Contrast studies of colonic grafts can be difficult to interpret due to altered anatomy (Licata *et al.*, 1978; Haerr *et al.*, 1987). Endoscopy and biopsy should therefore be considered early. Rigid endoscopy can be difficult and sometimes impossible to perform in a colonic graft placed subcutaneously. Flexible endoscopy is often useful under these circumstances. Early detection is likely to give the best chance of a cure with complete surgical resection of the diseased segment of the graft.

Reconstruction after pharyngolaryngectomy for carcinoma of the hypopharynx and cervical oesophagus can be achieved with a variety of techniques including colonic interposition, gastric pull-up, myocutaneous and axial flaps. More recently advances in microvascular surgical techniques offer the option of reconstruction using free revascularized loops of jejunum. This technique was employed in the present case following resection of the diseased colonic segment.

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#### References

- Akiyama, H., Nakayama, K. (1982) Carcinomas arising in the reconstructed oesophagus. *International Advances in Surgical Oncology* **5**: 145–161.
- Goldsmith, H., Beattie, E. Jr. (1968) Malignant villous tumour in a colon bypass. *Annals of Surgery* **167**: 98–100.
- Haerr, R. W., Higgins, E. M., Seymore, C. H., el-Mahdi, A. M. (1987) Adenocarcinoma arising in a colonic interposition following resection of squamous carcinoma. *Cancer* **60**: 2304–2307.
- Houghton, A. D., Jourdan, M., McColl, I. (1989) Dukes' A carcinoma after colonic interposition for oesophageal stricture. *Gut* **30**: 880–881.
- Isolauri, J., Helin, H., Markkula, H. (1991) Colon interposition for oesophageal disease; histological findings of colonic mucosa after a follow-up of five months to 15 years. *American Journal of Gastroenterology* **86**: 277–280.
- Isolauri, J., Markkula, H. (1991) Recurrent ulceration and colopericardial fistula as late complication of colonic interposition. *Annals of Thoracic Surgery* **86**: 277–280.
- Larson, T. C., Shuman, L. S., Libshitz, H. I., McMurtrey, M. J. (1985) Complications of colonic interposition. *Cancer* **56**: 681–690.
- Licata, A. A., Fecanin, P., Glowitz, R. (1978) Metastatic adenocarcinoma from oesophageal colonic interposition graft for oesophageal stricture. *Lancet* **1**: 285.

- Malcolm, J. A. (1968) Occurrence of peptic ulcer in colon used for oesophageal replacement. *Journal of Thoracic and Cardiovascular Surgery* **55**: 763–772.
- Perlmutter, D. H., Tapper, D., Teele, R. L., Winter, H. S. (1984). Colobronchial fistula as a late complication of coloesophageal interposition. *Gastroenterology* **86**: 1570–1572.

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