

A Free Jejunal Reconstruction Following the Failure of an Initial Esophageal Reconstruction with Colic Pedicle - Report of a Case

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A 58-year-old man who had undergone a gastrectomy for early cancer was admitted with a diagnosis of esophageal cancer. A subtotal esophagectomy with a reconstruction using the right hemicolon was performed. However, the reconstructed colon became necrotic and, as a result, the necrotic section of the colon was removed and the temporary esophagectomy and colostomy were made. A repeat reconstruction using free jejunal graft with micro vascular anastomoses was thus performed and the results were satisfactory.

Key words: esophageal cancer, free jejunal graft, secondary reconstruction

Introduction

Although the use of a gastric or colic pedicle is the established method for thoracic esophageal reconstruction, partial necrosis and/or fistula formation occasionally occurs because of either insufficient blood circulation or other negative side-effects related to the surgery. In such cases, a complete replacement can seldom be performed of inflammation and/or an infection of the surrounding tissue. A secondary reconstruction should be performed after both local inflammation and infection have been controlled.

We herein report a patient who had undergone a previous gastrectomy in whom a successful second reconstruction of the thoracic esophagus was performed using a free jejunal graft, after the initial failure of the right coloplasty using the presternal route.

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Case Report

A 58-year-old Japanese man was referred to our hospital with a diagnosis of esophageal cancer. His medical history included a distal partial gastrectomy for early cancer at the age of 46. On admission, no evidence of cervical lymphadenopathy was observed. The laboratory data were as follows: red blood cells, 435×10^4 /ml; white blood cells, 7500/ml; hemoglobin, 11.8 g/dl; hematocrit, 36.2%; and platelet count, 40.6×10^4 /ml. The serum chemistry findings showed no remarkable abnormalities. The tumor markers in the serum, including squamous cell carcinoma related antigen (SCC), carcinoembryonic antigen (CEA), and carbohydrate antigen 19-9 (CA19-9), were all within the normal limits.

Esophagography revealed a tumor which measured 7cm in size at the mid-thoracic portion of the esophagus, and endoscopy demonstrated an ulcerated tumor with an irregular border which occupied half of the entire esophageal wall (Fig.1). A biopsy specimen taken from the tumor was histologically proven to be squamous cell carcinoma. Computed tomography (CT) of the neck, chest and abdomen showed the thoracic esophageal wall to be thicker than normal and no evidence of invasion to the adjacent organs or any distant metastasis. As a result, the patient was considered to be a candidate for surgery.

On August 24, 1998, a subtotal esophagectomy with a regional lymph node dissection and thoracic esophageal reconstruction using the pedicled right colon was performed by the presternal route. There was no evidence of invasion of any neighboring organs. The tumor in the resected specimen measured 6.5×2.5 cm in size (Fig.2). A histological examination revealed poorly differentiated squamous cell carcinoma with evidence of lymph node metastasis. On the 7th postoperative day, the cervical end of the colon used for reconstruction was found to be necrotic due to dirty discharge and,

therefore, a resection of the necrotic area (7cm) together with an esophagostomy plus colostomy were performed. The cephalic end of the colostomy was exteriorized in the midline 7cm from the supra sternal notch. On the 36th postoperative day, an esophageal reconstruction using a free jejunal graft was attempted. A 20 cm-long segment of the jejunum was simultaneously harvested based on the second jejunal vascular system. The ves-

sels of the grafted jejunum were anastomosed to the right superior thyroidal artery and the internal jugular vein, respectively, under a microscope (Fig.3). The patient's postoperative course was uneventful and he was discharged on the 130th postoperative day after the initial surgery, tolerating a normal diet but experiencing a feeling of slight regurgitation. (Fig.4).



Fig.1. A barium esophagogram revealed a tumor in the middle thoracic esophagus.

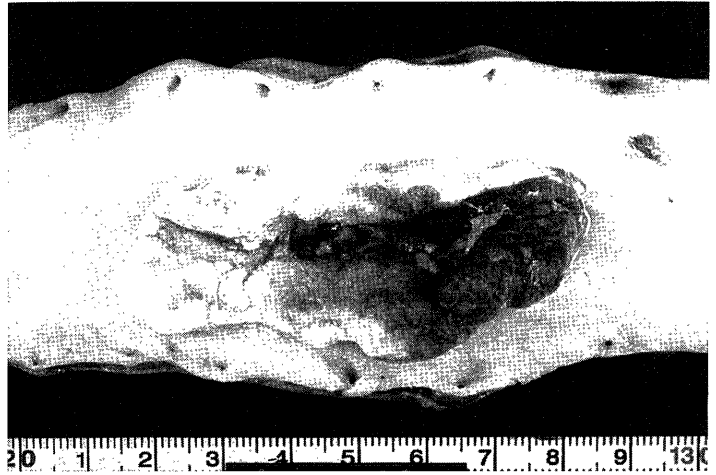


Fig.2. The resected specimen showed a Borrmann type 2 tumor in the middle thoracic esophagus.



Fig.3. A free jejunal graft was transplanted between the cervical esophagus and colic pedicle and the vessels of which were anastomosed to the right superior thyroidal artery and internal jugular vein.

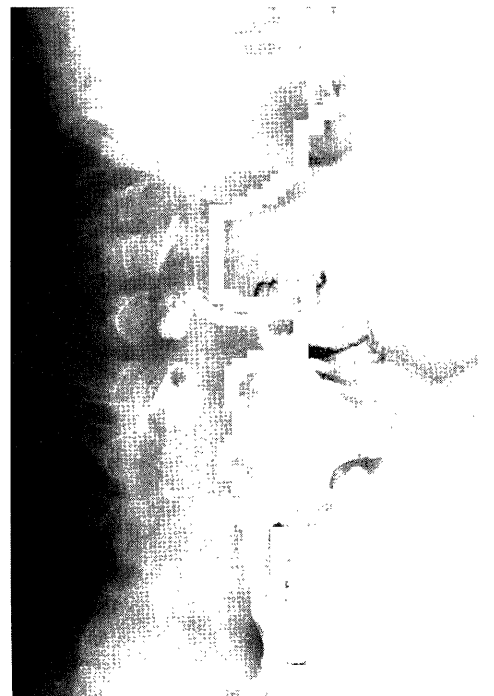


Fig.4. Barium was observed to pass swiftly into the colic pedicle through the transplanted jejunum on the 42th postoperative day.

Discussion

Owing to the recent advances in the treatment of esophageal cancer, the number of perioperative complications and the rates of morbidity have been decreasing. However, hospital mortality is high when patients develop necrosis in the organs used for reconstruction^{1,2)}. These complications occur because of the potential for vascular insufficiency at the cervical end of the pulled-up gastric or colic pedicles. Although, these pedicles are usually well nourished, the blood circulation is occasionally compromised due to¹⁾ tension on the pulled-up stomach or colon for a difficult reach,²⁾ a failure on the part of the operative maneuvers to sufficiently preserve the feeding vessels, and³⁾ the occurrence of negative side-effects due to the operation itself. Insufficient blood circulation is a primary factor in the development of necrosis since the length and type of organ used as an esophageal substitute are important. After a total thoracic esophagectomy for esophageal cancer, the organs used for esophageal replacement include the stomach, isoperistaltic jejunum and the short segment of the colon. The incidence of necrosis in the organs used for a reconstruction is only 1% for the stomach, 11% for the jejunum and from 13-16% for the colon^{3,4)}. In addition, the incidence of necrosis of the stomach used for reconstruction is 6% for the subcutaneous route, and 1% for both the retrosternal and the posterior mediastinal routes. Therefore, the incidence of necrosis of the stomach used for reconstruction was 3% for the presternal route while that of the colon was as high as 30%¹⁾. This is probably because the stability of blood supply to the colon is much less than that to the stomach, and also because the length of the presternal route is 3.7cm longer than that of the orthotopic route⁵⁾.

The diagnosis of necrosis was easy to make based on direct observations of the color of the organs and a check for the odour specific to the necrotic organ immediately after an incision of the skin. If the area of necrosis in an organ used for reconstruction is partial, then conservative treatment may sometimes be possible; however, surgical treatment, consisting of a resection of the necrotic area plus an esophagostomy and gastrostomy/colostomy, are usually required.

In our case, the restoration of esophageal continuity was achieved by a free jejunal transfer, since it is a popular and reliable method for a reconstruction of the pharynx and cervical esophagus⁶⁾. A free jejunal graft seems to provide the ideal material for reconstruction because it allows for the tension-free anastomosis of a well-vascularized intestine.

Patients with presternal colonic reconstructions are

highly selected for several reasons and should thus be considered as high risk candidates for postoperative necrosis of the colon. When necrosis of the organs used for reconstruction is observed, then early drainage and a secondary reconstruction using a free jejunal graft should result in a favorable outcome.

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