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Long-term outcome and quality of life after supercharged jejunal interposition for oesophageal replacement

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ABSTRACT

Background: The consequences of major conduit necrosis following oesophagectomy are devastating. Jejunal interposition with vascular supercharging is an alternative reconstructive method if colon is unavailable. Aims of this study were to review the long-term outcome and quality of life of patients undergoing this surgery in our tertiary unit.

Methods: Patients undergoing oesophageal reconstruction with supercharged jejunum were identified and retrospective review of hospital notes performed. Each patient was then interviewed for follow up data and quality of life assessment using the EORTC QLQ-C30 questionnaire.

Results: Six patients (5 men) (median age 59 years (range 34–72) underwent supercharged pedicled jejunal (SPJ) interposition from May 2005–August 2010. Indications for surgery were loss of both gastric and colonic conduits following surgery for oesophageal cancer ($n = 4$), loss of gastric conduit and previous colectomy ($n = 1$) and lastly, gastric and colonic infarction in a strangulated paraoesophageal hernia ($n = 1$). Median time to reconstruction was 12 months [6–15 range]. There were no in-hospital deaths. Median postoperative stay was 46 days [13–118]. Three patients required surgical re-intervention for leak, sepsis and reflux, respectively. Median follow up was 6.5 years [range 7–102 months]. One patient died seven months following surgery due to respiratory complications. On follow up, 5 patients have an enteral diet without supplemental nutrition, maintaining weight and good quality of life scores.

Conclusions: Supercharged jejunal interposition is a suitable alternative conduit for delayed oesophageal replacement in patients with otherwise limited reconstructive options. Good functional outcomes can be achieved despite formidable technical challenges in this group.

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Introduction

Necrosis of the gastric conduit following oesophagectomy is a rare but catastrophic complication associated with significant risk of major morbidity and mortality.[1] While colonic interposition is the first choice technique for reconstruction, there are a small proportion of patients in whom this also has failed, or is not an option due to previous colonic surgery.

The use of jejunum in oesophageal reconstruction is attractive due to its availability, peristaltic activity, very low risk of intrinsic disease and good size compatibility. Jejunum is frequently used as a free flap for pharynx or shorter segment cervical oesophageal reconstructions. For long segment thoracic oesophageal reconstruction, however, use is hindered by the segmental blood supply with short vascular arcades in the mesentery that limit extension to the upper thorax or neck. This can be overcome by performing microvascular anastomosis of the proximal graft to cervical or upper thoracic vessels, a process known as 'supercharging', first described by Longmire in 1948.[2] This challenging technique, in patients who have already experienced significant surgical morbidity, can offer a better solution than long-term cervical oesophagostomy and reliance on jejunostomy tube feeding.[3]

There are few reports on the long-term outcome, patient satisfaction and perception of symptoms following this procedure, offered in limited centres. We describe our experience of supercharged jejunal interposition for delayed oesophageal replacement and patience quality of life assessment.

Patients and methods

Six patients undergoing oesophageal reconstruction with supercharged jejunum (SPJ) were identified from a departmental database over the period from May 2005 to August 2010. Retrospective review of hospital notes was performed with interview of all patients for follow up data. Quality of life assessment was performed using the European Organisation for Research and Treatment of Cancer (EORTC) Quality of Life Questionnaire (QLQ-C30 version 3.0), an integrated system validated for assessing health-related quality of life of cancer patients, with the inclusion of an oesophago-gastric site specific module (QLQ-OG25).[4] Questionnaire C30 is a 30-item questionnaire that comprises five functional scales (physical, role, cognitive, emotional and social), one global quality-of-life scale, three symptom scales (fatigue, pain, and nausea and vomiting), and six single items (dyspnoea, insomnia, appetite loss, constipation, diarrhoea, and financial difficulties). Items in both questionnaires have the following four response categories: (1) not at all, (2) a little, (3) quite a bit, and (4) very much, except for the items within the global quality-of-life scale, which have seven responses that ranged from (1) very poor to (7) excellent. All questionnaire responses were transformed into scores on a linear 0 to 100 scale according to the EORTC scoring manual.[5]

The QLQ-OG25 is a 25-item module designed to increase QLQ-C30 in terms of sensitivity and specificity. This module comprises six multi-item scales: dysphagia; eating restrictions; reflux; odynophagia; pain, and anxiety, and 10 single-item symptoms, with higher scores indicating worse symptomatic problems for both multi- and single-item scales. Mean scores and standard deviations were calculated.

Surgical technique

All patients underwent a thorough preoperative work-up of fitness for surgery. Residual or recurrent disease was excluded by means of computed tomography of the neck, chest and abdomen in combination with PET scanning. Supercharged jejunal interposition surgery was undertaken jointly between the upper gastrointestinal and plastic surgical teams.

The patient is placed in the supine position and the cervical oesophagostomy mobilised through a left neck incision. The left hemi-manubrium, the sternal head of the clavicle and the medial 3 cm of the first rib are resected to expose the left internal mammary vessels. This provides space for the jejunal graft and prevents kinking of both the graft and its vessels in the root of the neck. Simultaneously, a midline laparotomy is performed and adhesions relating to the previous surgery carefully divided. The jejunum is mobilised and the vascular arcades are closely inspected under transillumination to identify appropriate vessels for the microvascular anastomosis (typically the first or second jejunal artery and vein) and the pedicle (usually the fourth or fifth jejunal vessels). Either the subcutaneous or substernal route (with splitting of the sternum) can be chosen as a route for the conduit. The jejunum, as part of a long Roux loop, is brought up into neck [Fig. 1]. With both routes, it is essential that the vascular pedicle of the jejunum is not compressed or under tension. The internal mammary vessels are normally selected for the microvascular anastomosis with an end-to-end arterial anastomosis and an end-to-side venous anastomosis performed with using 9.0 or 10.0 non-absorbable sutures [Fig. 2]. If the internal mammary vein is not suitable for the microvascular anastomosis, the brachiocephalic, internal jugular or cephalic veins can be used. An end-to-side anastomosis between the cervical oesophagus and jejunum is performed with

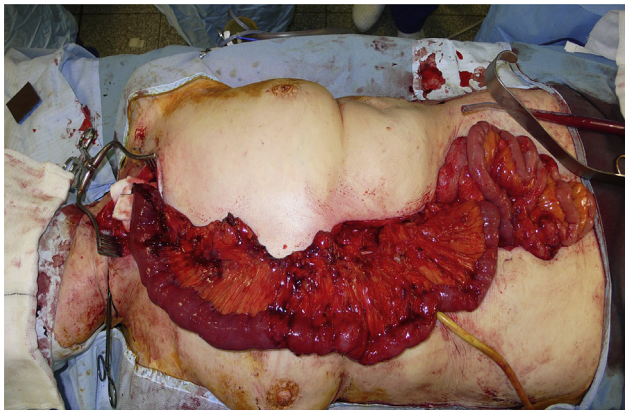

Fig. 1 – Mobilised jejunal limb for substernal or subcutaneous positioning for vascular supercharging with upper thoracic or cervical vessels to augment proximal blood supply.