Early Experience with Laparoscopic Ischemic Conditioning of the Gastric Conduit prior to Gastropharyngeal Anastomosis in Total Esophagectomy

Domenech Asbun, MD, Steven P Bowers, MD

MAYO CLINIC

BACKGROUND

Gastric tube conduit is commonly used for reconstruction after esophageal resection extending to the pharynx. Significant morbidity and mortality may result from conduit necrosis. Ischemic conditioning of the gastric conduit many weeks prior to reconstruction has been employed to decrease the risk of conduit necrosis. We present our early experience using laparoscopic ischemic conditioning of the stomach prior to gastropharyngeal reconstruction after total esophagectomy.

METHODS

A review was done of all patients between 3/2019 and 3/2020 who underwent ischemic conditioning of the gastric conduit prior to total esophagectomy and gastropharyngeal anastomosis at our institution. Ischemic conditioning included laparoscopic ligation of the left gastric and short gastric vessels. Esophagectomy was performed at the time of gastropharyngeal anastomosis. Patient and disease-specific factors were recorded, along with perioperative details and outcomes.

RESULTS

Four patients were identified (Table 1). Two underwent operations for resection of malignant lesions, and two for severe benign esophageal strictures refractory to alternative management. Concomitant procedures were performed at the time of gastric conditioning and at the time of esophagectomy. Time between gastric conditioning and esophagectomy spanned from 55 to 67 days. Operative times for ischemic conditioning lasted between 97 min to 134 min. Esophagectomies lasted between approximately 7 hours to over 12 hours. There were no mortalities nor major complications within 30 days of the procedure. Two contained anastomotic leaks were managed without need for subsequent procedures.

Table 1. Patient demographic and perioperative details

Age (years)	Diagnosis	Chemo/ XRT	Other procedures during ischemic conditioning	Other procedures during esophagectomy	30-day complications and management
62	Chronic esophageal stricture	Y	Removal G tube, placement J tube	N	N/A
56	Chronic tracheoesophageal stricture	N	Removal G tube, placement J tube	N	N/A
64	Recurrent tonsillar squamous cell carcinoma	Y	Removal G tube, placement J tube	Pharyngolaryngectomy, pectoralis myofascial flap, bilateral neck dissection	Contained leak. Managed nonoperatively
66	Adenoid cystic carcinoma of esophagus	N	Placement J tube	Latissimus dorsi myofascial flap, selective neck dissection	Contained leak, superficial SSI. Managed nonoperatively.

Y: yes. N: no. Chemo: chemotherapy. XRT: radiation. G tube: gastrostomy tube. J tube: jejunostomy tube. SSI: surgical site infection

CONCLUSIONS

In our small cohort, ischemic conditioning of the gastric conduit prior to gastropharyngeal anastomosis was associated with acceptable outcomes in this high-risk patient population. Further studies are warranted to show reproducibility of favorable results on a larger scale, and to delineate which patients may benefit most from this approach to reconstruction after total esophagectomy.

REFERENCES

1. Mingol-Navarro, F., Ballester-Pla, N. & Jimenez-Rosellon, R. Ischaemic conditioning of the stomach previous to esophageal surgery. *J Thorac Dis* **11**, S663–S674 (2019).
2. Pham, T. H. *et al.* Laparoscopic ischemic conditioning of the stomach increases neovascularization of the gastric conduit in patients undergoing esophagectomy for cancer. *Journal of Surgical Oncology* **116**, 391–397 (2017).
3. Siegal, S. R. *et al.* Gastric Ischemic Conditioning Prior to Esophagectomy Is Associated with Decreased Stricture Rate and Overall Anastomotic Complications. *J Gastrointest Surg* **22**, 1501–1507 (2018).
4. Zhuo, Z.-G. *et al.* The efficacy of ischemic conditioning in the prevention of gastroesophageal anastomotic complications: a meta-analysis. *Annals of Palliative Medicine* **9**, 1586595–1581595 (2020).