CASE REPORT

Minimally invasive esophagectomy in a patient with end-stage renal disease

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SUMMARY

Renal failure has been identified as a major predictor of surgical complications and esophagectomy carries high morbidity for patients. We discuss the preoperative and postoperative considerations for performing a minimally invasive Ivor-Lewis esophagectomy for a benign long-segment stricture in a patient with end-stage renal failure.

BACKGROUND

The incidence of end-stage renal disease (ESRD) has increased over the past few years with more than 114 000 new cases per year.¹ Surgery on patients with ESRD presents a challenge for the surgeon and requires a multidisciplinary team approach. These patients commonly have multiple metabolic and cardiovascular comorbidities, which makes them high-risk surgical candidates. Esophagectomy by itself carries a mortality of 4–10% and a complication rate of 26–41%.^{2–3} Chronic kidney disease is an independent risk factor for postoperative cardiovascular complications in general.⁴ A careful preoperative evaluation in the elective setting is essential to minimise perioperative and postoperative complications.⁵ We present the case of a minimally invasive Ivor-Lewis esophagectomy (MIE) performed on a patient with ESRD and discuss the considerations for the case.

CASE PRESENTATION

A 64-year-old man with long segment distal esophageal stricture secondary to long-standing

reflux (figure 1A) had undergone multiple balloon dilations for a year and eventually had an esophageal stent placement with short periods of symptomatic relief. The patient was eventually offered an esophagectomy. He had a history of stroke, ESRD on haemodialysis, hypertension, gastro-oesophageal reflux disease and chronic pancreatitis. His surgical history was significant for a prior appendectomy, cholecystectomy and arteriovenous fistula creation.

INVESTIGATIONS

The patient underwent a preoperative esophagram, showing a long segment distal esophageal stricture (figure 1A).

TREATMENT

We scheduled the patient's procedure on a day following his regular haemodialysis. He underwent an MIE with feeding jejunostomy tube placement. Intrathoracic mediastinal dissection was difficult due to chronic inflammation from his long segment stricture (figure 2A). A 28 mm end-to-end anastomosis stapler was used to create the gastric conduit to esophageal anastomosis (figure 2B). His intraoperative course was significant for hypotension requiring pressor support. Pressors were weaned off postoperatively after volume resuscitation. He was admitted to the intensive care unit after the operation and a nephrology consultation was obtained immediately to manage his haemodialysis.

Figure 1 Image of esophagram. (A) Preoperative esophagram showing long segment stricture. (B) Postoperative esophagram showing no leak at the anastomosis.

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Figure 2 Minimally invasive esophagectomy. (A) Mobilisation of the esophagus with long segment esophageal stricture. (B) Anastomosis of the gastric conduit to the esophagus with end-to-end anastomotic stapler.

He underwent dialysis the following day. An esophagram was obtained on postoperative day 7 (figure 1B), which showed no leak. He had no immediate complications in the perioperative period. He was discharged to a skilled-nursing facility on postoperative day 8.

OUTCOME AND FOLLOW-UP

The patient returned a week later with anaemia requiring blood transfusion, presumed to be secondary to a gastrointestinal bleed from either the anastomotic site or the J-tube site. This was not seen during the upper endoscopy. It was attributed to uraemic platelet dysfunction secondary to ESRD. There was no evidence of leak or stricture on repeat imaging. The patient's oral intake was advanced to a regular diet after this admission.

DISCUSSION

With the increasing incidence of ESRD, surgeons need to be familiar with the perioperative management of these patients as more of them are requiring major surgery especially in tertiary care centres. In a recent analysis of the Society of Thoracic Surgeons database, looking at predictors of morbidity and mortality after esophagectomies, three patients with renal failure were identified who underwent an esophagectomy for esophageal cancer and 66% had a major complication compared to a rate of 24% overall.² In another retrospective analysis of 412 Ivor-Lewis esophagectomies, renal failure was found to be a significant predictor of anastomotic leak, using univariate analysis, where one of six patients with renal failure had a leak.⁶ Although these were very small samples, they draw attention to the significantly increased risk of complications in this population, such as anastomotic leak, and morbidity and mortality in general. Thus, an experienced surgeon with a high volume of esophagectomy per year should perform minimally invasive esophagectomy in this group of patients.³

We also recommend an early consultation with a nephrologist to manage the patients' haemodialysis, volume status and electrolytes. To improve patient factors, preoperative conditioning such as promoting cardiovascular fitness by encouraging walking a mile a day and using a spirometer for a month prior to surgery, as well as smoking cessation to decrease the risk for morbidity, is suggested. Using the minimally invasive technique also decreases hospital stay, and allows for early ambulation and participation in physical therapy due to lower pain scores after surgery.⁷ All medications must be renally dosed, and those with active metabolites that are renally excreted, such as Demerol, must be avoided. Attention must be paid to preventing volume overload and electrolyte abnormalities, mainly hyperkalaemia. Dialysis on the day prior to the operation is essential to prevent such complications intraoperatively. However, there are postoperative concerns regarding haemodialysis-induced hypotension, especially in a procedure resulting in a tenuous blood supply such as an esophagectomy. Careful preoperative and postoperative management after minimally invasive esophagectomy can provide good outcome in this high-risk group of patients.

Learning points

- ▶ Preoperative conditioning and optimisation is essential to minimise postoperative complications and morbidity in patients with end-stage renal disease.
- ▶ Haemodialysis the day prior to surgery prevents volume overload and electrolyte derangements prior to surgery.
- ▶ Careful management of blood pressure is mandatory during the operation as well as in the perioperative period, especially during haemodialysis.

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Competing interests None declared.

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