Learning from errors

Small bowel fistula and its impact: incorrect placement of left ventricular assist device cannulas leads to severe intestinal complications

Kadir Yilmaz, Heinrich Erpenbeck, Thorsten Drews, Roland Hetzer

Cardiovascular Surgery Department, German Heart Institute Berlin, Berlin, Germany

Correspondence to Dr Kadir Yilmaz, kdrylmz@gmx.de

Summary

A young man presented with a chronic abdominal dermal irritation 4 years after implantation of a left ventricular assist device (LVAD; Berlin heart excor). The LVAD was needed because of end-stage heart failure following a chronic parvovirus B19 infection. The implantation of mechanical circulatory support systems (MCS) has nowadays become an accepted treatment modality for patients with end-stage heart failure. Recent literature shows several intestinal complications related to MCS, but no case presents the development of a small bowel fistula to the jejunum, transversal colon and stomach. We present a case of inaccurate placement of Berlin heart excor LVAD cannulas and its impact. This case emphasises the importance of correct placement of VAD cannulas to achieve an optimal long-term result. After surgical treatment the postoperative course was prolonged because of increasing peritonitis probably based on ongoing intraperitoneal chronic contamination with intestinal germs. The patient unfortunately deceased.

BACKGROUND

There is a need of appropriate patient selection for implanting extracorporeal assist devices, and demonstrates that patients with less than optimal results should be referred for surgical correction early, before the device produces severe secondary damage.

No case presents the development of a small bowel fistula to the jejunum, transversal colon and stomach.

CASE PRESENTATION

A man in the early 30s presented with a chronic abdominal dermal irritation 4 years after implantation of a left ventricular assist device (LVAD (excor)). The LVAD was needed because of end-stage heart failure following a chronic parvovirus B19 infection.¹ Medical history included several hospitalisations caused by multiple infections in the area of cannula emersion points beside multiple intestinal

Figure 1 Preoperative photograph showing high surface inflammation around the ventricular assist device cannula emersion points.

Figure 2 Intraoperative photograph showing fistula and adhesion in the transition of jejunum to the ileum.

dysfunctions. At the time of admission the patient's clinical status was very poor, and he was suffering from significant abdominal dermal irritations as well as secretion of diffuse purulence at the emersion points of the LVAD excor cannulas (actinomorph distance 5 cm) (figure 1). The microbiological examination detected a wide range of partially resistant aerobic and anaerobic bacteria, including *Enterobacter cloacae*, *Escherichia coli* (extended-spectrum β -lactamase (ESBL)), *Corynebacterium amycolatum*, *Proteus mirabilis* and *Staphylococcus aureus* (methicillin-resistant *Staphylococcus aureus* (MRSA) and fungi (*Candida albicans*) with high convergence. Antibiosis was applied under consideration of the resistogram. CT located a fistula of the small bowel rolled into a large adhesion to the right cannula with loss of contrast medium into the highly inflamed surrounding area. Therefore it was decided to treat the condition surgically. Following median abdominal incision and cautious preparation, requiring sharp resection of most of the intraperitoneal tissue, the adhesive right cannula was set free (figure 2). We saw large fistula measuring 3×1 cm within an adhesion in the transition from the jejunum to the ileum. After release and dissection of the colon segments, the fistula was closed. A further adhesive fistula from the transverse colon to the right cannula was resected and the stomach showed another large adhesion to the cannula.

INVESTIGATIONS

The microbiological examination detected a wide range of partially resistant aerobic and anaerobic bacteria, including *E cloacae*, *E coli* (ESBL), *C amycolatum*, *P mirabilis* and *S aureus* (MRSA) and fungi (*C albicans*) with high convergence.

DIFFERENTIAL DIAGNOSIS

No clinical signs for acute abdomen or a systemic inflammatory response syndrome were present.

OUTCOME AND FOLLOW-UP

The patient unfortunately deceased.

DISCUSSION

Recent literature shows several intestinal complications related to mechanical circulatory support,^{2–4} but no case presents the development of a small bowel fistula to the jejunum, transversal colon and stomach.

Learning points

- Each decision for implanting a ventricular assist device (VAD) emphasises the importance of correct placement of extracorporeal cannulas to achieve an optimal long-term result
- Patients with mechanical circulatory support must be in close collaboration with psychologists
- Patients with mechanical circulatory support related complications should be referred to appropriate medical centres early.

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Competing interests None.

Patient consent Obtained.

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