Fluid optimization guided by oesophageal Doppler significantly improves bowel perfusion

Editor—We report an emergency laparotomy in an elderly patient, where central venous pressure (CVP) did not provide a reliable guide to intraoperative fluid administration. However, oesophageal Doppler-guided fluid resuscitation sufficiently improved perfusion of the compromised gut to allow a definitive and curative operation to proceed, in circumstances where conservative management and a second operation would otherwise have been necessary.

An 82-yr-old lady presented with symptoms and signs of acute bowel obstruction. Examination revealed severe abdominal distension and an irreducible right femoral hernia. She was moderately hypotensive and anuric. Urea and creatinine levels were elevated, and there was a mild metabolic alkalois. The lactate level was 4.8 mmol litre⁻¹. Acute small bowel obstruction secondary to an incarcerated femoral hernia was diagnosed. The patient was taken to theatre for an emergency laparotomy.

Anaesthesia was induced with fentanyl 100 μg, propofol 100 mg, and succinylcholine 100 mg, followed by rocuronium. Anaesthesia was maintained with oxygen 50%, air 50%, and desflurane. I.V. morphine (20 mg) was used for analgesia. An arterial line and a right jugular central venous line were inserted.

At operation, the diagnosis of a strangulated femoral hernia containing ischaemic small bowel was confirmed. Three attempts were made to resect non-viable small bowel, but on each occasion, the ends of the bowel became extremely ischaemic and anastomosis could not be attempted.

As the initial CVP was 15 mm Hg, fluid resuscitation in this first hour of surgery was restricted to 1 litre of Hartmann’s solution and 500 ml of Volulyte®. An oesophageal Doppler probe (Cardio-Q™, Deltex Medical Ltd, Chichester, West Sussex) was inserted, and the stroke volume and cardiac output were found to be significantly reduced, although the CVP was apparently adequate (Table 1). It was determined that severe intravascular volume depletion was the cause of the poor gut perfusion and was preventing the formation of an anastomosis. Surgery was halted, so that intensive fluid resuscitation could be undertaken. The ends of the small bowel were stapled off and returned to the abdomen. Over 45 min, 1.5 litre of Hartmann’s solution and 1.5 litre of Volulyte were infused. Stroke volume and cardiac output improved dramatically (Table 1). Surgery was recommenced.

The cut ends of the small bowel were now well perfused and bleeding freely at the edges. A side-to-side ileal anastomosis was carried out and a defunctioning loop ileostomy was formed. The abdomen was closed easily and the patient was transferred to the intensive care unit.

The trachea was extubated after 12 h, and inotropic support was weaned off after 48 h. Urine output improved to 40–100 ml kg⁻¹ h⁻¹ within 24 h of surgery, and lactate levels decreased rapidly. The patient was discharged from the intensive care unit (ICU) after 5 days. The loop ileostomy was closed without laparotomy some months later.

Clinical trials demonstrating the benefits of oesophageal Doppler-guided fluid management in colorectal surgery have focused almost exclusively on elective bowel resection.¹⁻³ Greater improvements should be seen in patients undergoing emergency bowel resection, but no studies addressing this question have been published. This case demonstrates that the use of oesophageal Doppler can optimize perioperative fluid therapy in the elderly sick laparotomy patient. More fluid was administered than would have been the case had the CVP been used to guide therapy. The patient did not develop pulmonary oedema and was extubated successfully 12 h after admission to ITU. If CVP measurements had been used, the patient would have remained underperfused.

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**Table 1** Comparison of intraoperative CVP and oesophageal Doppler recordings during volume resuscitation. Total volume given 4500 ml

<table>
<thead>
<tr>
<th>Time after induction of anaesthesia (min)</th>
<th>Fluid given cumulative total (ml)</th>
<th>Central venous pressure (mm Hg)</th>
<th>Oesophageal Doppler measurements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hartmann’s solution</td>
<td>Volulyte®</td>
<td>Stroke volume (ml)</td>
</tr>
<tr>
<td>60</td>
<td>1000</td>
<td>500</td>
<td>14</td>
</tr>
<tr>
<td>75</td>
<td>1500</td>
<td>1000</td>
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<td>1500</td>
<td>15</td>
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<tr>
<td>105</td>
<td>2500</td>
<td>2000</td>
<td>20</td>
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and the bowel could have been permanently compromised. The surgical course of the operation, and hence the outlook for the patient, may be changed dramatically by oesophageal Doppler-guided fluid management.

**Conflict of interest**

None declared.

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**A survey of patients discharged to the community on modified-release strong opioids by a tertiary level Acute Pain Service**

Editor—Modified-release strong opioids are commonly prescribed for the management of acute pain in hospital patients. There are little data available on follow-up of such patients in the community. Most of the available literature focuses on aspects of long-term use of strong opioids in chronic pain conditions.¹

To quantify this issue in our institution, we carried out a retrospective survey of our practice on this aspect of patient care. In our hospital, patients on modified-release strong opioids being discharged home are given a letter detailing medications and a request to the general practitioner to review the analgesia and reduce opioid dosage as appropriate. Verbal consent is sought from all patients to telephone them 6 weeks after discharge to assess progress. Results of the telephone follow-up are documented and retained by the Acute Pain Service (APS) and we have reviewed these data.

Local Ethics Committee Approval was sought but was judged to be not necessary for this anonymized review of our existing clinical practice. Over a period of more than 2.5 yr, 264 patients were discharged to the community on modified-release strong opioids. Of these, 48% were prescribed oxycodone-sustained release tablets, 42% received morphine-sustained release tablets, 8% with fentanyl patches, and 2% were discharged on oral hydromorphone. The telephone follow-up rate was 50% with an average time to follow-up of 63 days. Of the 131 patients successfully followed-up, 75% had discontinued the strong opioid. Thirty-three patients (25%) were still on the strong opioid. There was active participation from the patient’s general practitioner in the titration of the opioid medication in 70 patients (53%).

There are concerns about discharging patients with acute pain conditions into the community on strong opioids. These involve aspects of care such as dose titration, reviewing for possible side-effects, withdrawal effects from the opioids, and potential for misuse or addiction. Opioids are legally regulated medications and there is a need for strict accounting of prescriptions. This is particularly so in the context of acute pain management, since the medication requirements should reduce as the acute pain condition resolves. This leads us to the issue of whether it is safe to discharge patients into the community on modified-release strong opioids for acute pain. In our survey of 131 patients discharged from the APS, the majority of patients (75%) had successfully weaned off the opioid medication. While the results from those patients whom we contacted were encouraging, 50% of the patients were lost to follow-up. One of the major reasons for poor follow-up rate was an inability to contact patients by telephone. Despite this, we have had no letters or telephone calls from Primary Care to ask advice or express concerns over these prescriptions.

This survey has highlighted the difficulties of prescribing strong opioids for acute pain in patients who are discharged into the community and their continued follow-up. APSs across the UK have striven to improve analgesia for patients, but by doing so, there is the potential that we may create problems for our colleagues in Primary Care. Despite this, we should strive to follow-up these patients in a more robust manner through improved liaison with our Primary Care colleagues, patients, and their carers. The importance of careful documentation of a management plan in the patient’s case notes cannot be stressed enough.

**Conflict of interest**

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