Reminder of important clinical lesson

Rupture of an inferior epigastric artery pseudo-aneurysm following laparoscopic port insertion

William Reginald Joseph Carr, Zakir K Mohamed, Jeremy Cundall

Department of Colorectal Surgery, University Hospital North Durham, Durham, UK

Correspondence to William Reginald Joseph Carr, wrjcarr@doctors.org.uk

Summary

Laparoscopic port insertion is a potential cause of trauma to the inferior epigastric artery, resulting in pseudo-aneurysm formation. Treatment of pseudo-aneurysms includes thrombin injection, coil embolisation, embolisation with *N*-butyl cyanoacrylate, compression therapy or surgical excision and ligation. The authors present a case of pseudo-aneurysm caused by port insertion during laparoscopic sigmoid colectomy. The pseudo-aneurysm was identified using CT and Doppler ultrasound scans, but underwent spontaneous resolution with cessation of flow prior to intervention. The patient was therefore discharged, but he presented again as an emergency with rupture of a clinically infected pseudo-aneurysm and needed emergency surgical intervention.

BACKGROUND

Pseudo-aneurysm of the inferior epigastric artery (IEA) is a rare event with less than 20 reported cases and varying management techniques. A guideline on the management of this is lacking and management, so far, has depended on the size of the aneurysm and the expertise available. The aneurysm in our patient was relatively small (3.5 cm) at diagnosis with cessation of flow within a week and yet the aneurysm ruptured within 4 weeks of discharge of the patient. This shows that there is a potential for rapid expansion and life-threatening complications to occur without aggressive intervention and prompt follow-up, especially if there are concerns over infection with the pseudo-aneurysm.

CASE PRESENTATION

A 68-year-old gentleman presented through the National Bowel Screening Program with a malignant polyp in his sigmoid colon that had been incompletely excised endoscopically. His past medical history included obesity (body mass index 30) and hypertension.

He underwent a laparoscopic sigmoid colectomy with a stapled end-to-end anastomosis. Access was gained through an umbilical cutdown with further ports inserted and removed under direct vision, including a 10 mm port in the right iliac fossa, a 5 mm suprapubic port and a further 5 mm left iliac fossa port. The specimen was extracted through a small Pfannenstiel excision.

On the fourth postoperative day, he deteriorated suddenly with a respiratory arrest requiring intubation and transfer to the intensive treatment unit (ITU). He was treated for pneumonia after a CT angiogram ruled out pulmonary embolism. An abdominal CT scan on the 7th day showed a 7 × 6 × 7 cm thin-walled collection in the left iliac fossa with a small amount of free gas. A diagnostic laparoscopy was performed, regaining access through the umbilicus with further ports placed through the existing left and right iliac fossa incisions. Old blood was washed out, but no evidence of an anastomotic leak was noted.

After being for 2 weeks in the ITU, he made a gradual recovery from pneumonia and was transferred to the ward on day 19 postoperative. On day 25 postoperative, he complained of increasing pain in the left iliac fossa and clinical examination revealed a 5 cm swelling in the left iliac fossa consistent with a haematoma. There were no signs of overlying cellulitis or erythema. At this point he was afebrile, but inflammatory markers had risen after cessation of intravenous antibiotics for pneumonia. A repeat CT was performed, which identified a high-attenuation lobulated lesion measuring 35 mm in the left lower rectus abdominus sheath close to IEA (figures 1 and 2). A Doppler ultrasound (US) scan confirmed a 3 cm pseudo-aneurysm with active flow.

DIFFERENTIAL DIAGNOSIS

On identification of a swelling in the left iliac fossa the differential diagnosis included a port site incisional hernia, haematoma, deep wound infection or pointing abscess possibly resulting from an anastomotic complication. The CT scan followed by ultrasound scan confirmed the diagnosis of pseudo-aneurysm.

TREATMENT

A decision was made to treat this with percutaneous thrombin injection, but due to a national shortage of thrombin this was delayed for 6 days. Repeat ultrasound performed just prior to thrombin injection identified spontaneous thrombosis with cessation of flow in the pseudo-aneurysm (figure 3). The patient was therefore discharged home with plans for a follow-up ultrasound scan.

After 4 weeks, he was re-admitted with increasing pain and erythema surrounding a 10 cm pulsatile swelling in the left iliac fossa associated with a bloody purulent discharge from the old port site incision. He was immediately taken to the operation theatre for exploration, which revealed an actively bleeding pseudo-aneurysm requiring ligation and excision.

Figure 1 CT scan showing 3.5 cm pseudo-aneurysm arising from the left inferior epigastric artery.

OUTCOME AND FOLLOW-UP

Postoperatively he made an uneventful recovery and was discharged after 2 days. Outpatient review at 6 months revealed well-healed scars with no signs of herniation or recurrent abdominal wall swellings.

DISCUSSION

The IEA branches off the external iliac artery just above the inguinal ligament, passing in front of the posterior layer of rectus sheath, most commonly 4–8 cm from the midline.¹ This makes it prone to injury, during laparoscopic procedures, potentially resulting in a pseudo-aneurysm. A pseudo-aneurysm is a pulsating,

Figure 2 CT scan showing 3.5 cm pseudo-aneurysm arising from the left inferior epigastric artery.

Figure 3 Doppler ultrasound scan showing no flow in the pseudo-aneurysm.

encapsulated haematoma in communication with the lumen of a ruptured vessel. It differs from a true aneurysm in that not all the layers of the artery wall are involved. Less than 20 cases of IEA pseudo-aneurysm have been reported in the literature. The majority are iatrogenic, following paracentesis, open surgical incision, laparoscopic port insertion and tenckhoff catheter removal although a few spontaneous cases have been reported.²

The presentations of IEA pseudo-aneurysms are very vague, making the clinical diagnosis difficult. They often present as painful swelling and pulsation of the mass is the exception rather than the rule. The initial clinical impression is often of a haematoma, as in our case, and subsequent imaging can confirm the diagnosis. Contrast-enhanced CT scan and Doppler US scans are the modalities of choice for diagnosis and a classical finding of 'to and fro' flow is diagnostic on Doppler US scan.³ The time of presentation is usually within 8 weeks from the initial injury, although a delay of up to 4 years has been reported.⁴

The traditional treatment of IEA pseudo-aneurysm has been surgical excision and ligation. Although the success rate of this method is high, it involves a general anaesthesia and incision, with possible complications. With the development of endovascular techniques, coil embolisation of the feeding vessel became popular.⁵ This had a high success rate, but with the possibility of complications at the entry puncture site, usually a femoral vessel. Percutaneous injection of thrombin for IEA pseudo-aneurysm was first described in 2002⁶ and this method has been established in treating pseudo-aneurysms at other sites, with a success rate of around 91–100%.⁷ The simplicity of percutaneous injection with no significant complications, except for the theoretical risk of thrombin migration into the patent artery, makes this procedure the first choice. Failure can be managed by coil embolisation or surgical ligation.⁸ Other conservative methods like US compression of neck of aneurysm has fallen out of favour due to a lower success rate, discomfort to the patient and practical difficulties of continuous lengthy compression with US probe.⁴

We chose to inject thrombin in our patient for this reason, although a 3 cm pseudo-aneurysm is considered small.⁴ However, the US scan prior to injection, after a delay of 6 days to obtain the thrombin, showed a cessation of

flow in the aneurysm and we organised a 3 month follow-up Doppler scan to reassess. Unfortunately, this patient presented prior to this with a rupture of the pseudo-aneurysm, requiring surgical ligation. We recommend a closer follow-up and prompt treatment of pseudo-aneurysm with the above methods, irrespective of the size at presentation, due to the risk of rupture. If there is clinical suspicion of infection in the pseudo-aneurysm then surgical management is preferable to less invasive methods.

Learning points

- ▶ Care needs to be taken to insert and remove laparoscopic ports under direct vision to avoid injury to the inferior epigastric artery and detect bleeding.
- ▶ Thrombin injection of a pseudo-aneurysm has a high success rate with minimal complications.
- ▶ An infected pseudo-aneurysm needs more aggressive intervention.
- ▶ Follow-up with Doppler ultrasound scan should be performed to confirm complete resolution of the pseudo-aneurysm.

Competing interests None.

Patient consent Obtained.

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