CASE REPORT

Spigelian hernia and pitfalls of postoperative anticoagulation

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SUMMARY

Spigelian hernias are a rare lateral ventral abdominal hernia that carry a high risk of strangulation due to their smaller sizes, and require surgical intervention. In more complex cases involving an anticoagulated patient, perioperative management of anticoagulation must be monitored and reviewed to avoid potential pitfalls. We present an 81-year-old woman who presented with right groin pain, and was requiring warfarin anticoagulation due to her cardiac history. The spigelian hernia was diagnosed and reduced laparoscopically, and the defect was repaired and reinforced by mesh. However, the patient suffered from catastrophic complications postoperatively related to her anticoagulation management. Spigelian hernias require surgical interventions. However, in an anticoagulated patient with significant comorbidities, perioperative anticoagulation needs to be closely monitored to balance the risk of thromboembolic disease with acceptable postoperative bleeding risks.

BACKGROUND

Spigelian hernias are a rare lateral ventral abdominal hernia that account for approximately 2% of abdominal hernias.¹ They are characterised by the protrusion of extraperitoneal fat, peritoneal sac or viscus through a defect in the transversus aponeurosis, typically in the interparietal space in between the lateral border of the rectus abdominis muscle (along the semilunar line) and spigelian fascia.² Due to their small sizes, they carry a high risk of strangulation, and thus require surgical repair.³

They are more commonly occurring in females than males,⁴ with incidences peaking between 40 and 70 years of age.³

In this case report, we discuss the surgical approach to management of this hernia, with the added complexity of an anticoagulated patient and review potential pitfalls for perioperative anticoagulation management.

CASE PRESENTATION

An 81-year-old woman presented to a regional hospital with a 1-day history of progressive right groin pain and swelling. Her abdominal pain was positional, with associated nausea but no vomiting. There was no change in her bowel habits. Examination demonstrated a subtle tender lump over the right iliac fossa with no signs of peritonism and no evidence of cough impulse.

Medical history included atrial fibrillation, bioprosthetic mitral valve replacement, tricuspid annuloplasty and a previous coronary artery bypass graft, requiring warfarin anticoagulation. Preoperatively, she had an Internationalised Normal Ratio (INR) of 2.3 and an activated Partial Thromboplastin Time (aPTT) of 73. Bridging heparin infusion therapy was commenced day 1 postoperatively, where the patient had an INR of 1.3 and an aPTT of 33.

INVESTIGATIONS

CT of her abdomen demonstrated a small fat-containing right lower anterior abdominal wall hernia. There were no mass lesions or abnormal fluid collections found. Ultrasound showed a 2.4 cm hernia defect, comprising of partially reducible fat. No other inguinal or femoral hernias were identified.

TREATMENT

After failing initial conservative management for the first 24 hours (due to high risks of surgical intervention in this patient), which included analgesia, bowel rest and ongoing monitoring, the patient then proceeded to have an operative repair of the hernia, with warfarin reversal and bridging heparin infusion therapy. A transabdominal preperitoneal (TAPP) repair was used, where a 10 mm visiport was placed lateral to the left rectus sheath at the level of the umbilicus and two 5 mm ports were placed in the left lower and left upper quadrant, respectively. This allowed the diagnosis of a right fat-containing spigelian hernia to be made at the time of the procedure, approximately 10 cm superior to the deep inguinal ring (figures 1 and 2). The peritoneum surrounding the hernia was incised to allow preperitoneal dissection of the defect. The hernia sac was reduced (figures 3 and 4) and closed with 2–0 vicryl sutures and reinforced by placing a prolene mesh (7.6×15 cm) over the defect on the transversalis fascia layer (figure 5A), while the peritoneum was closed over the mesh with fixation tacks (figure 5B).

OUTCOME AND FOLLOW-UP

The patient was well at 24 hours post repair and, in consultation with cardiology and haematology, was kept on a heparin infusion. At this stage, the patient was handed over from the operating surgeon to another surgeon-in-charge, due to a scheduling arrangement. This heparin infusion continued over the next 48 hours. However, due to errors on the

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Figure 1 Laparoscopic view of spigelian hernia.

ward in monitoring and maintaining an appropriate therapeutic window (aPTT 55–80), it was found that the patient had grossly subtherapeutic aPTT levels of 33 over a 12-hour period. It was decided to switch the patient from heparin infusion to a therapeutic Clexane dose (1 mg/kg two times per day) for ease of administration in a low-acuity nursing facility.

On the evening following the first therapeutic Clexane dose, the patient developed sudden hypotension and acute onset of left flank pain. Urgent CT imaging demonstrated a large pelvic haematoma (1 L) immediately deep to the anterior abdominal wall with mass effect on the urinary bladder and left ureter. Arterial phase indicated no obvious arterial blush or active haemorrhage.

The patient failed to improve despite fluid resuscitation and was taken back to the operating theatre for a diagnostic laparoscopy and washout of haematoma. Laparoscopy confirmed a large extraperitoneal haematoma in the anterior abdominal wall medial and away from the site of mesh repair. This was thought to be due to a spontaneous bleed arising from an inferior epigastric artery and unrelated to her prior mesh repair. Given the size of the haematoma, no signs of active bleeding and the tamponade effects in the abdominal wall, no further surgical intervention was performed at that stage and the patient was transferred to a tertiary referral hospital for interventional radiology management. She subsequently underwent radiological guided angiobolisation of her left inferior epigastric artery, which was identified as the bleeding source (figure 6).

A repeat CT done day 10 postoperatively indicated that the pelvic haematoma had reduced marginally in volume. Despite this, the patient suffered another hypotensive episode and an acute haemoglobin drop to 54. Attempts at resuscitation with

Figure 2 Laparoscopic instrument indicating hernia defect.

Figure 3 Incision of surrounding peritoneum.

3 bags of packed red blood cells and 1 L crystalloid fluid were unsuccessful and she passed away shortly after.

DISCUSSION

This case highlights the complexity of managing a high-risk elderly patient with significant comorbidities, despite a multi-disciplinary approach, to a complex procedure. It once again reinforces the need to weigh up all the pros and cons when considering surgery in this population.

The general recommendation for spigelian hernias is operative management, due to the high risk of strangulation.² This can be done either via an open or laparoscopic approach. Laparoscopic repairs have been associated with lower morbidity rates and shorter length of hospital stay.^{2,5} Carter and Mizes performed the first intra-abdominal laparoscopic repair of spigelian hernias in 1992.⁶ Since then, multiple successful laparoscopic repairs have been recorded, where the mesh is placed intraperitoneally via TAPP approach. This approach is also particularly useful for cases where the nature of the diagnosis is not definitively established preoperatively, as was in the case described here.

However, despite providing the advantages of a minimally invasive approach, there are associated risks of visceral injury and postoperative obstruction.⁷ Alternatively, a total extraperitoneal approach, where a prolene mesh is placed extraperitoneally, has also been utilised in clear-cut cases, as it decreases the risks of complications such as intestinal obstruction and fistulisation of bowel, while still offering the benefits of a laparoscopic approach.^{8,9}

An alternate approach would be an open anterior hernioplasty repair, where a prolene mesh is placed in the preperitoneal space, over the abdominal wall defect.¹⁰ However, the only prospective study by Moreno-Egea *et al*¹¹ compared 11 patients who

Figure 4 Reduction of hernia through anterior abdominal wall defect.

Figure 5 (A) Hernia site postmesh repair. (B) Closure of peritoneum over mesh overlay.

underwent open repair with 11 patients who underwent laparoscopic repair of a spigelian hernia. It showed that although both laparoscopic and open approach had similar operating times and rates of recurrence, morbidity was significantly lower with

Figure 6 Angioembolisation showing extravasation from a proximal medial branch of left inferior epigastric artery. Arrow depicts contrast extravasation site.

laparoscopic versus open approach (0% vs 36.4%; $P < 0.05$), with four patients who underwent an open repair developing a postoperative haematoma. Furthermore, laparoscopic repairs resulted in much lower readmission rates (9% vs 90% in this study) and length of hospital stay (1 vs 5 days; $P < 0.001$).¹¹

Despite recovering well from the operation itself, our patient unfortunately succumbed to the complications of the postoperative management of anticoagulation.

It is well-established that postoperative anticoagulative measures are imperative, due to the increased risk of thromboembolic disease.¹² However, balancing these risks of thromboembolism against surgical bleeding remains an ongoing challenge in current surgical practice. A multitude of studies have tried to quantify the risks and benefits and to provide guidelines to best practice in these cases.

A large review focusing on the administration of postoperative intravenous heparin analysed 10 000 patients with atrial fibrillation. They demonstrated that intravenous heparin bridging therapy resumed immediately postoperatively increased the risk of morbidity, with 300 patients developing a major bleed postoperatively, while thromboembolic events were only prevented in 4 out of the 10 000 patients.¹³ This is largely attributed to the higher risk of postoperative heparin-induced bleeding, as compared with the lower risks associated with postoperative thromboembolism.¹²

The authors suggested that although patients require both warfarin and bridging therapy postoperatively, warfarin anticoagulation should be recommenced on the evening following surgery while bridging therapy, using low molecular weight (LMW) subcutaneous heparin at a therapeutic dose, should only be commenced 24–48 hours post-surgery to reduce risks of postoperative bleeding.¹⁴

A multidisciplinary team managed our patient with up-to-date management protocol, given the patient's comorbidities, including having a CHAD₂S₂-VASc score of 5, with 10% risk of stroke, transient ischaemic attack (TIA)s or systemic embolism.¹⁵ However, despite this and perhaps also due to some human error in postoperative monitoring, the patient's outcome was poor.

Learning points

- ▶ Spigelian hernias remain a rare abdominal wall hernia that are difficult to diagnose clinically.
- ▶ Early surgical repair is recommended, given the high risk of strangulation, with laparoscopic repairs for uncomplicated cases generally having low morbidity and complications.
- ▶ Perioperative anticoagulation requires close monitoring to avoid thromboembolic disease with acceptable postoperative bleeding risks.
- ▶ Surgeons must be cognizant of this issue when performing operations on an increasingly high-risk subset of patients that require anticoagulation.

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