

Case study

Pitfalls and Pearls Obtained from a Case of Strangulated Spigelian Hernia Repair

Abstract

Strangulated Spigelian hernia is an uncommon abdominal emergency. This condition requires open emergency surgery, which often involve bowel resection. Here I have described a case of strangulated right sided Spigelian hernia with gangrenous small bowel. The surgery was conducted through a lower abdomen transverse incision with small bowel resection and anastomosis. The hernia defect was closed with tension free Darning's repair. Post operative day 4, the abdomen was reexplored as patient had signs of intestinal obstruction. Intraoperative findings showed distal small bowel kinking with anastomosis dehiscence. Lessons learnt from this case highlights the importance of adherence to general principles of emergency surgery such as, choice of abdominal incision, safe method of hernia closure, prevention of intraperitoneal adhesion and safety of bowel anastomosis in emergency surgery.

Keywords

Strangulated Spigelian hernia, Strangulated ventral hernia, Spigelian hernia, Ventral interstitial hernia, Emergency ventral hernia repair, Early Adhesion Small Bowel Obstruction (ASBO), Darning's repair

Introduction

Spigelian hernia is a rare abdominal hernia (0.1-2% of all abdominal hernias) which occurs in the obese population, commonly from the age of 40-70 years¹. The defect of a Spigelian hernia, occurs through the weaken transversus abdominis aponeurosis, at the semilunar line and below the arcuate line². Spigelian hernia is difficult to identify clinically as the contents often slips in between the muscular layers (hence, the name ventral interstitial hernia) and 90% of patients are asymptomatic³. Nevertheless, it should be sought and repaired because it carries a high risk of strangulation, 20-40%³.

Limited literature about repair of strangulated Spigelian hernia, have shown that a transverse lower abdominal incision and primary tissue repair technique to close the hernia defect is popular choice^{4,5}.

Case History

A 52 years of age gentleman presented with two days history of painful right iliac fossa swelling which was associated with symptoms of intestinal obstruction. Further history revealed that he was having intermittent pain at that site for the past two years but did not seek medical attention. On examination, the abdomen was distended with a tender 15 x 7 cm oblong parietal swelling at the right iliac fossa (Picture 1). Abdominal x ray showed dilatated small bowel with absent gas in large bowel. A clinical diagnosis of strangulated Spigelian hernia was made and surgery was done within an hour of presentation.

At surgery, a transverse right lower abdomen incision was made along the horizon of the swelling and the wound was explored. The hernia sac was seen at the subcutaneous plane having breached the external oblique aponeurosis (Picture 2). The hernia defect was found to be 5 x 7 cm in dimension involving all musculo-aponeurotic layers of the abdomen. The edges of the defect was extended horizontally to release the constriction and facilitate inspection of the content (Picture 3). The hernia content was gangrenous small bowel about 20cm from the terminal ileum and omentum (Picture 4). After thorough inspection of the small bowel length by retraction and exteriorizing through the wound, an omentectomy and small bowel resection was done. Proximal bowel was oedematous and dilated, but had good vascularity. A Cheatle's slit at distal bowel end was done to achieve a good mucosal apposition and hence, the small bowel was repaired in single layer with interrupted polyglactin 3/0 sutures (Picture 5).

Subsequent to the repair, the small bowel was reduced into the abdomen and primary tissue repair for the hernia defect was done in layers. The peritoneum was closed with absorbable sutures in a continues fashion. The tranversus abdominis and internal oblique muscle was closed with horizontal mattress technique utilising 2/0 nylon sutures (Picture 6). This was reinforced with Darning stiches from the inguinal ligament to the lateral border of rectus sheath (Picture 7). The external oblique aponeurosis was the approximated with nylon 0 sutures in continuous fashion. The wound was closed

Comment [DDM1]: Was presented

Comment [DDM2]: Painful right iliac fossa swelling since couple of days

Comment [DDM3]: With symptoms associated with

Comment [DDM4]: The symptoms may be briefed in next sentence

Comment [DDM5]: radiograph

Comment [DDM6]: revealed

Comment [DDM7]: idea is not clear. Kindly make it clear

Comment [DDM8]: abdominal

Comment [DDM9]: sq. cm.

Comment [DDM10]: were

Comment [DDM11]: continuous

Comment [DDM12]: delete

with skin staplers after placement of a subcutaneous vacuumed drain to eliminate the dead space (Picture 8).

Patient did recover well for the first post two post operative days. But on day three, he developed signs of intestinal obstruction. As the possibility of post operative ileus was entertained, he was kept nil by mouth with a nasogastric tube inserted, which produced about 2 litres of bilious fluid. The differentials at this juncture were deep wound dehiscence with bowel herniation or anastomotic stenosis. CT scan done on post op day four, showed dilated small bowel with a transition point at terminal ileum and no features of herniation or anastomotic leak (Picture 9).

Hence, he was re-explored via a midline laparotomy on the same day. At laparotomy, the small bowel was kinked due to fibrinous adhesion at the terminal ileum distal to the anastomosis, hence resulting in dehiscence of the anastomosis at the mesenteric border (Picture 10). The anastomosis was taken apart and both ends of the bowel was brought out as end double barrel ileostomy. The hernia repair was intact, hence was not disturbed.

He made a slow recovery thereafter in the Intensive Care Unit, and was discharged home well after 2 weeks of hospital stay.

Comment [DDM13]: post-operative

Comment [DDM14]: delete

Comment [DDM15]: 4th post-operative day

Comment [DDM16]: were





Picture3: The hernia defect measures 5 x 7 cm



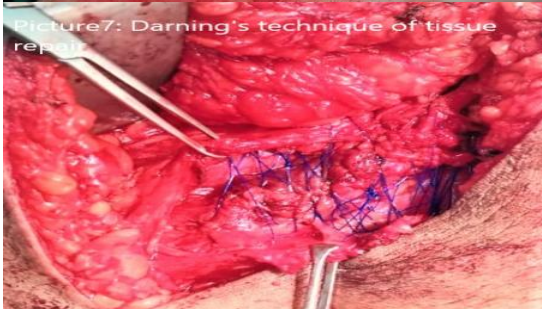
Picture4: Gangrenous small bowel and omentum are the content of the hernia sac.



Picture5: Anastomosis of small bowel ends



Picture6: Repair of the Transversus Abdominis and Internal Oblique muscles



Picture7: Darning's technique of tissue repair



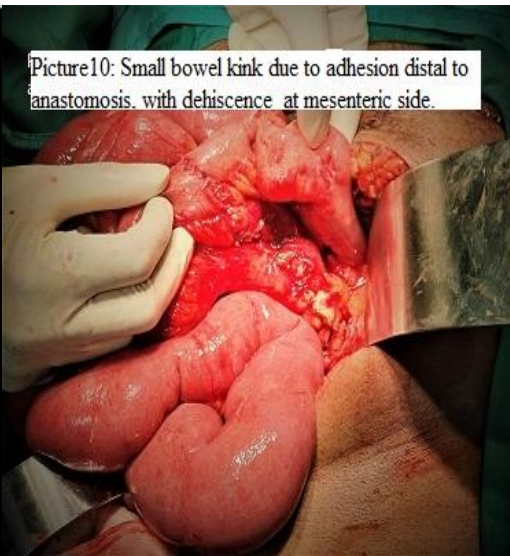
Picture8: Post operative wound

Comment [DDM17]: Description of picture is not visible. Required correction may be done

UNDEL



Picture9: CT scan showing bowel clumping with transition at terminal ileum



Picture10: Small bowel kink due to adhesion distal to anastomosis, with dehiscence at mesenteric side.

Discussion

The principles of strangulated Spigelian hernia repair require two important considerations. The first is the ideal access into the abdomen to facilitate resection and reconstruction of bowel. And the second is the safest method of hernia repair in emergency situation. The choice of access is divided between a midline laparotomy or a lower abdomen transverse incision. A midline laparotomy allows flexible wound extension in situations where access to all four abdominal quadrants is required. This is important especially if a complex resection is required such as a hemicolectomy^{5,6}. The drawbacks of a midline approach compared to a transverse incision include, more pain and significant scarring⁵. A transverse lower abdominal incision gives direct access to the hernia defect facilitating an easy layered tissue repair, but has limited access to the entire abdominal cavity⁶. Nevertheless, resection and anastomosis of small bowel can be achieved by exteriorizing the small bowel and its mesentery from the wound^{4,5,7,8}.

Comment [DDM18]: As a

Comment [DDM19]: scarring

Techniques of repair for the hernia defects in emergency setting especially if bowel resection is involved, is still controversial in the clinical setting. By principle a tension free tissue repair reduces the risk of bacterial contamination and is faster to perform in emergency setting. Studies with strangulated inguinal and ventral hernia surgeries have shown that mesh placement in surgeries

Comment [DDM20]: insert comma

Comment [DDM21]: insert comma

requiring bowel resection produce equal rates of infective complications as tissue repair with a lower recurrence rate^{9,10}. An ideal mesh for such setting is either a medium (0.8mm) pored polypropylene mesh or an absorbable mesh¹¹. Extrapolating these data, a mesh repair can be considered for cases with bowel resection in a Spigelian hernia repair, as did Lucien *et al.*, who placed a mesh at the preperitoneal space when they repaired a strangulated Spigelian hernia with bowel resection⁴. This case report, emulates the success in managing a similar case by Ndong *et al.*, who performed the tension free Darning tissue repair⁵.

Intraperitoneal adhesion is inevitable after an abdominal surgery, especially with emergency surgeries where bleeding, bowel desiccation and in advent tissue trauma is higher than elective surgeries. Early adhesion formation is due to fibrinous exudative process, which are flimsy and are degraded with time by the fibrinolytic process¹². In this case the early adhesion formation between the small bowels have caused the distal small bowel to kink causing intestinal obstruction. Techniques to reduce adhesion like preventing tissue desiccation by warm packs and prevent prolonged exteriorization of the bowel, gentle tissue handling, and reduce blood and contamination in the field may have reduces adhesion formation.

Small bowel anastomosis in an emergent setting is safe provided patient is physiologically and nutritional normal¹³. Besides that, the bowel ends should have good microvasculature and the anastomosis must be tension free with good mucosal apposition¹⁴. Reflecting back on this case, besides the distal obstruction, the anastomotic dehiscence may have been due to tissue strangulation as the sutures was placed on an edematous bowel end.

Conclusion

Abiding to the core principles of abdominal surgery is important in managing a case of strangulated Spigelian hernia. A tailored approach in managing these patients is important with the intention to normalize patients' physiology with a safest and simplest surgery.

Comment [DDM22]: insert comma

Comment [DDM23]: preventing

Comment [DDM24]: reduce

Comment [DDM25]: nutritionally

Comment [DDM26]: Please follow the format and styling uniformly

Consent

Informed consent was taken from the patient for reporting and publishing this case.

References

1. Rankin A, Kostusiak M, Sokker A. Spigelian Hernia: Case Series and Review of the Literature. *Visc Med*. 2019;35(2):133-136. doi:10.1159/000494280
2. Skandalakis PN, Zoras O, Skandalakis JE, Mirilas P. Spigelian hernia: surgical anatomy, embryology, and technique of repair. *Am Surg*. 2006;72(1):42-48.
3. Moles Morenilla L, Docobo Durántez F, Mena Robles J, Quinta Frutos R de. Spigelian hernia in Spain: An analysis of 162 cases . *Rev Española Enfermedades Dig* . 2005;97:338-347.
4. Lucien W, Sikakulya FK, Peter K, Vincent A. Large Strangulated Spigelian Hernia: Management of an Uncommon Presentation of Abdominal Hernias in Central Uganda. Saha SP, ed. *Case Rep Surg*. 2019;2019:8474730. doi:10.1155/2019/8474730
5. Ndong A, Tendeng JN, Niang FG, et al. Strangulated spigelian hernia with necrosis of the caecum, appendix and terminal ileum: an unusual presentation in the elderly. *J Surg Case Reports*. 2020;2020(6). doi:10.1093/jscr/rjaa115
6. Abdominal incisions in general surgery: a review. *Ann Ibadan Postgrad Med*. 2007;5(2):59-63. <https://pubmed.ncbi.nlm.nih.gov/25161434>.
7. Ng ZQ, Low W, Subramanian P, Stein J. Strangulated Small Bowel in a Spigelian Hernia and a Review of the Literature. 2017;2:1-5.
8. Igwe PO, Ibrahim NA. Strangulated sliding spigelian hernia: A case report. *Int J Surg Case Rep*. 2018;53:475-478. doi:<https://doi.org/10.1016/j.ijscr.2018.10.043>
9. Abd Ellatif ME, Negm A, Elmorsy G, Al-Katary M, Yousef AE-AM, Ellaithy R. Feasibility of mesh repair for strangulated abdominal wall hernias. *Int J Surg*. 2012;10(3):153-156.

doi:<https://doi.org/10.1016/j.ijssu.2012.02.004>

10. Emile SH, Elgendy H, Sakr A, et al. Outcomes following repair of incarcerated and strangulated ventral hernias with or without synthetic mesh. *World J Emerg Surg.* 2017;12(1):31. doi:10.1186/s13017-017-0143-4
11. Brown CN, Finch JG. Which mesh for hernia repair? *Ann R Coll Surg Engl.* 2010;92(4):272-278. doi:10.1308/003588410X12664192076296
12. Arung W, Meurisse M, Detry O. Pathophysiology and prevention of postoperative peritoneal adhesions. *World J Gastroenterol.* 2011;17(41):4545-4553. doi:10.3748/wjg.v17.i41.4545
13. Nair A, Pai DR, Jagdish S. Predicting anastomotic disruption after emergent small bowel surgery. *Dig Surg.* 2006;23(1-2):38-43. doi:10.1159/000093493
14. Goulder F. Bowel anastomoses: The theory, the practice and the evidence base. *World J Gastrointest Surg.* 2012;4(9):208-213. doi:10.4240/wjgs.v4.i9.208