



A SURGICAL CHALLENGE IN THE REPAIR OF INFRAUMBILICAL INCISIONAL HERNIAS

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Abstract

Background: Incisional hernia (IH) is one of abdominal surgery's most prevalent postoperative complications. Its recurrence rate is still high despite the many techniques and procedures described for repairing IH and its prevention. The management of IH requires knowledge and expertise to reduce the high rates of postoperative complications and recurrence. The diversity and complexity of IH may force the hernia surgeon to individualize the treatment because it seems that. The aim of the study is the surgical challenge in the repair of infraumbilical incisional hernias.

Case report: The patient, a 51-year-old woman, had an infraumbilical edema. She had a scar in the midline of the infraumbilical region from tubal ligation (Figure 1). She experienced swelling in the infraumbilical region 15.18 months ago, which grew larger and became intractable. She described her history of suffering in this area. No further grievances were raised. 1-0 Vicryl was used to seal the peritoneal layer. On either side of the midline, a gap was formed between the layer of muscle and the aponeurosis that covered it. Interrupted 1-0 Vicryl sutures were used to approximate the rectus muscle to the midline. Over the muscle layer, a polypropylene mesh was positioned and secured. After being positioned over the mesh's surface, the negative suction drain was removed via a different incision. Horizontal mattress sutures without any polypropylene sutures were used to approach the aponeurotic layer. On the twelfth postoperative day, skin staples were taken out. The post-operative period went smoothly. For the past three months, the patient has been monitored with no signs of a recurrence or related symptoms.

Conclusion: Due to the physical lack of strong musculo-aponeurotic components in the area, infraumbilical incarcerated incisional hernias present the greatest surgical challenge. Due to the hernia's complete irreducibility, a laparoscopic procedure is deferred. The safest method is the open approach, notwithstanding its technological difficulties. This involves making room for a mesh to be placed between the aponeurosis and the muscle layer. This prevents all of the issues associated with the onlay technique as well as the peritoneal penetration of an inlay procedure.

Keyword: Infraumbilical incisional hernia, Surgical Challenge

Introduction

Infraumbilical incisional hernia in women is usually seen following gynecological operations. Since the aponeurotic structures become sparse as one proceeds below the umbilicus, placement of the mesh and its fixation becomes difficult.[1] A modified technique of dissection was performed to create a good space to place the mesh safely below the aponeurotic layer. A laparocele is the protrusion under the skin of internal organs through a previous surgical scar of the abdominal wall. It is a progressive disease, and its prevalence has not changed over the years, despite the improvement of the surgical technique of repair. [2-5] and the introduction of valid prosthetic materials [6-7]. The use of prostheses has significantly reduced the rate of recurrences, from 30-50% of the traditional surgery up to 5-10% of the current “tension-free” procedures [8], yet it is still considered high. Several factors are involved in the etiopathogenesis of laparocele recurrence, such as patient age, associated chronic diseases, metabolic disorders, alterations of the interstitial collagen, and, as a consequence, the wound healing process [9-10]. The prosthetic repair of the abdominal wall by laparoscopic or “open” approach is the current standard of care: reducing the number of recurrences and complications, minimizing the risk of respiratory deficit typical of no “tension-free” techniques, and obtaining a more acceptable aesthetic outcome are the goals of this kind of surgery [11]. Only in a few cases is a direct closure of the parietal defect considered a valid solution. The currently practiced surgical techniques differ from each other for the collocation of the prosthesis, which can be over the rectus muscles plan according to Chevrel’s procedure (“onlay technique”), between the rectus muscles and the posterior rectus sheath or peritoneum according to the Rives-Stoppa’s (“inlay technique”), or intraperitoneally in direct contact with the bowel (“underlay technique”), being performed by either laparoscopic or laparotomic approach [12-13]. The prevalence of recurrences is still significant in laparoscopic surgery, despite different surgical approaches and the range of prosthetic materials employed. The authors analyse the causes of this complication through the examination of their caseload, trying to formulate some suggestions in order to reduce occurrence.

Case report

The patient, a 51-year-old woman, had an infraumbilical edema. She had a scar in the midline of the infraumbilical region from tubal ligation (Figure 1). She experienced swelling in the infraumbilical region 15-18 months ago, which grew larger and became intractable. She described her history of suffering in this area. No further grievances were raised. History and Physical Examination Radiology

An incarcerated infraumbilical midline incisional hernia with a significant amount of the omentum protruding was discovered by contrast-enhanced computed tomography (CECT) (Figure 2). An open surgical operation was performed on the patient. The prior surgical scar was removed, and a vertical elliptical incision was formed. It was determined that the sac, which contained omentum, was about 15 cm in diameter. The borders of the defect were well defined during the dissection, which was completed up to the neck (Figure 3). The omentectomy was carried out with extreme caution to protect the small bowel loops underneath. The peritoneal repair was then separated from the muscle layer above to create a gap (Figure 4).



Figure 1: Infraumbilical Incisional hernia



Figure 2: CECT showing an irreducible incisional hernia.

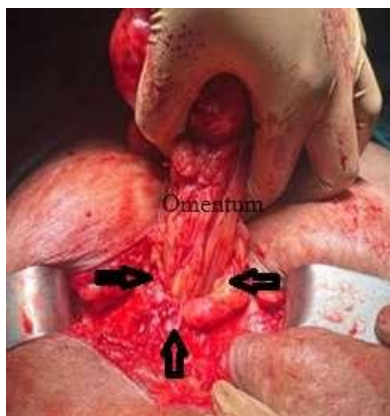


Figure 3: Sac dissected upto the neck muscle layer and overlying aponeurosis.

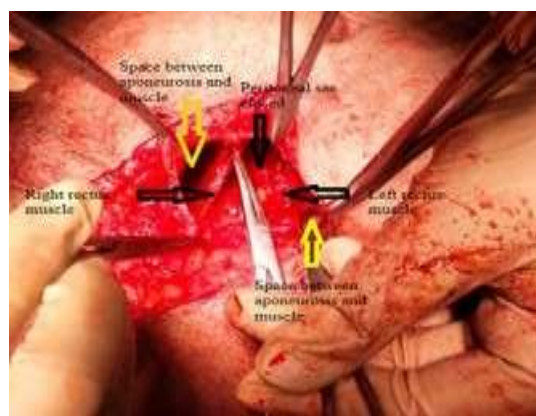


Figure 4: Space created between rectus abdominis



Figure 5: Rectus abdominis on both sides approximated in the midline.



Figure 6: Mesh placed over the muscular layer.

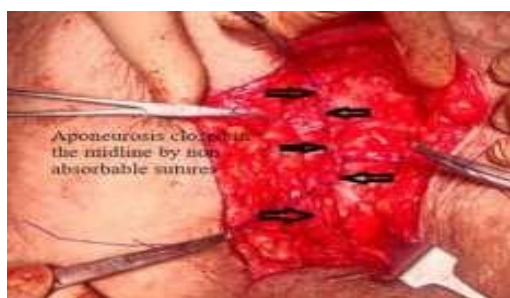


Figure 7: Aponeurosis approximated over the mesh.

1-0 Vicryl was used to seal the peritoneal layer. On either side of the midline, a gap was formed between the layer of muscle and the aponeurosis that covered it. Interrupted 1-0 Vicryl sutures were used to approximate the rectus muscle to the midline (Figure 5). Over the muscle layer, a polypropylene mesh was positioned and secured (Figure 6). After being positioned over the mesh's surface, the negative suction drain was removed via a different incision. Horizontal mattress sutures without any polypropylene sutures were used to approach the aponeurotic layer (Figure 7). On the twelfth postoperative day, skin staples were taken out. The post-operative period went smoothly. For the past three months, the patient has been monitored with no signs of a recurrence or related symptoms.

Discussion

Infraumbilical incisional hernia repair is a complex surgical challenge due to the complex interplay between anatomical, biomechanical, and patient-related factors [1]. An incisional hernia may develop when the abdominal wall at the site of a previous surgical incision is compromised, allowing intra-abdominal contents to pass through a deteriorating fascial layer. Infraumbilical incisional hernias, located below the umbilicus, are particularly problematic due to the relatively weak lower abdominal wall musculature, elevated intra-abdominal pressure, and frequent correlation with previous

operations such as cesarean sections, hysterectomies, and lower gastrointestinal procedures. Risk factors for incisional hernias include obesity, diabetes, smoking, malnourishment, wound infections, and improper closure methods

The biggest obstacle to procedure selection is the infraumbilical region's anatomy. For certain types of hernias, laparoscopic surgeries are advised. [1,14], But in this instance, the laparoscopic procedure was postponed due to the substantial amount of omentum trapped in the hernia. Irreducible omentum and sac management were aided by an open technique. It was easy to establish peritoneal closure. But the most difficult part was determining the level at which the mesh should be positioned. For a good fixation of the mesh, the tissue below and above the mesh needs to be strong. In the case presented, there were two options for placing the mesh, either over the peritoneal layer or as an onlay over the closed aponeurosis. However, as an onlay approach is associated with a multitude of complications, it was deferred. [15-16] Hence, an attempt was made to develop a plane between the aponeurosis and the external oblique muscle. Closure and approximation of the rectus muscle in the midline provided a firm foundation for placing a mesh over it. A polypropylene mesh was placed over the muscular layer and was fixed. A negative suction drain was placed over the plane of the mesh and brought out through a separate incision. A negative suction tube drain helps in obliterating the dead space around the mesh. The drain was removed on the third postoperative day. Skin staples were removed on the twelfth postoperative day with complete healing of the suture line.

This method eliminates the concern that the mesh will pierce the peritoneal layer and guarantees that it is adequately shielded between the layers. The issues that are often linked to an onlay approach were not observed because it is at the intermediate anatomical level. [17-19] This method works quite well for treating complex infraumbilical incisional hernias.

Conclusion

Due to the physical lack of strong musculo-aponeurotic components in the area, infraumbilical incarcerated incisional hernias present the greatest surgical challenge. Due to the hernia's complete irreducibility, a laparoscopic procedure is deferred. The safest method is the open approach, notwithstanding its technological difficulties. This involves making room for a mesh to be placed between the aponeurosis and the muscle layer. This prevents all of the issues associated with the onlay technique as well as the peritoneal penetration of an inlay procedure.

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References

1. De Vries Reilingh TS, van Goor H, Charbon JA, Rosman C, Hesselink EJ, van der Wilt GJ, et al. Repair of giant midline abdominal wall hernias: components separation technique versus prosthetic repair: interim analysis of a randomized controlled trial. *World J Surg.* 2007;31(4):756-63.
2. BOUILLOT JL, SERVAJEAN S, BERGER N, VEYRIE N, HUGOL D. Comment choisir une prothèse pour le traitement des éventrations abdominales? *Ann Chir* 2004; 129: 132-137.
3. AMMATURO C, BASSI G. Surgical treatment of large incisional hernias with an intraperitoneal Parietex Composite mesh: our preliminary experience on 26 cases. *Hernia* 2004; 8: 242-246.
4. LERMITE E, PESSAUX P, TUECH JJ, AUBÉ C, ARNAUD JP. Adhérences viscérales après cure d'éventration par plaque intrapéritonéale: étude monocentrique comparant un renfort conventionnel (Mersilene®) à un renfort composite (Parietex®). *Ann Chir* 2004; 129: 513-517.
5. ARNAUD JP, HENNEKINNE-MUCCI S, PESSAUX P, TUECH JJ, AUBE C. Ultrasound detection of visceral adhesion after intraperitoneal ventral hernia treatment: a comparative study of protected versus unprotected meshes. *Hernia* 2003; 7: 85-88.
6. GONZALEZ R, RODEHEAVER GT, MOODY DL, FORESMAN PA, RAMSHAW BJ. Resistance to adhesion formation: a comparative study of treated and untreated mesh products placed in the abdominal cavity. *Hernia* 2004; 8: 213-219.

7. FLUM DR, HORVATH K, KOEPESELL T. Have outcomes of incisional hernia repair improved with time? A population-based analysis. *Ann Surg* 2003; 237: 129-135.
8. NOVELLINO L, MANCIN A, SPINELLI L, MORELLI A, CIOCCA M. I grandi laparoceli: posizionamento di protesi per via laparoscopica. *Arch Atti Soc Ital Chir* 2002; 2: 29-32.
9. JUNGE K, ROSCH R, ANUROV M, TITKOVA S, OTTINGER A, KLINGE U, SCHUMPELICK V. Modification of collagen formation using supplemented mesh materials. *Hernia* 2006; 10: 492-497.
10. KLINGE U, BINNEBOSEL M, MERTENS PR. Are collagens the culprits in the development of incisional and inguinal hernia disease? *Hernia* 2006; 10: 472-477.
11. TRIVELLINI G, CONTESSINI AVESANI E. Trattamento chirurgico dei disastri parietali. *Arch Atti Soc Ital Chir* 2002; 2: 33-47.
12. ABDOLLAHI A, MADDAH GH, MEHRABI BM, JANGJOO A, FORGHANI MN, SHARBAF N. Prosthetic incisional hernioplasty: clinical experience with 354 cases. *Hernia* 2010; 14: 569-573.
13. Amid PK. Classification of biomaterials and their related complications in abdominal wall hernia surgery. *Hernia* 1997; 1: 15-21.
14. Den Hartog D, Dur AH, Tuinebreijer WE, Kreis RW. Open surgical procedures for incisional hernias. *Cochrane Database Syst Rev*. 2008;2008(3):CD006438.
15. Wéber G, Baracs J, Horváth OP. Onlay" mesh provides significantly better results than "sublay" reconstruction. Prospective randomized multicenter study of abdominal wall reconstruction with sutures only or with surgical mesh—results of a five-year follow-up. *Magy Seb*. 2010;63(5):302-11.
16. Ahmad M, Niaz WA, Hussain A, Saeeduddin A. Polypropylene mesh repair of incisional hernia. *J Coll Physicians Surg Pak*. 2003;13(8):440-2.
17. Langer C, Liersch T, Kley C, Flosman M, Süß M, Siemer A, et al. Twenty-five years of experience in incisional hernia surgery: a comparative retrospective study of 432 incisional hernia repairs. *Chirurg*. 2003;74(7):638-45.
18. Langer C, Schaper A, Liersch T, Kulle B, Flosman M, Füzesi L, et al. Prognosis factors in incisional hernia surgery: 25 years of experience. *Hernia*. 2005;9(1):16-21.
19. Vagholkar K. Retro rectus mesh repair for umbilical hernia in adults: a study of 50 cases. *Int Surg J*. 2020;7:49-53.