



Evaluation of the mesh fixation technique in laparoscopic incisional hernioplasty

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ABSTRACT

The laparoscopic repair of incisional hernias still has controversial aspects, among which is the technique for mesh fixation to the posterior abdominal wall. Whereas some authors advocate single fixation with mechanical suture, others recommend a combined fixation of transmural sutures and staples. **Case history:** We report the case of a recurrent incisional hernia, which was treated via the laparoscopic approach and found to be caused by a failure in mesh fixation. The re-operation was completed via laparoscopy and 12 months after surgery she remains asymptomatic with no apparent recurrence. **Conclusion:** (1) 'Ideal mechanical fixation' does not yet exist and must always be tested before the operation can be considered completed and (2) folds or creases in double-layer meshes must be avoided as they seem to favour the formation of visceral adhesions.

Key words: Incisional hernia, laparoscopy, mesh fixation

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The laparoscopic repair of incisional hernias still has controversial aspects, among which is the technique for mesh fixation to the posterior abdominal wall. Whereas some authors currently advocate single fixation with mechanical suture, others recommend a combined fixation of transmural sutures and staples.^{[1]-[4]} We report the case of a recurrent incisional hernia which was operated on via laparoscopy and found to be caused by a failure in the mechanical fixation of the mesh.

CASE HISTORY

A 42-year-old woman with a body mass index of 38, underwent surgery for hysterectomy, double anexectomy and appendectomy some years ago. Later on, an incisional hernia was repaired by means of the anterior approach, then she developed a recurrence of the inci-

sional hernia, which was repaired via laparoscopy. Existing doubts as to a possible early recurrence after a month's follow-up were confirmed by tomography (Figure 1). After 3 months follow-up and with the patient's written consent we decided on a further laparoscopic operation in an attempt to complete the repair of the defect. At the start of adhesion lysis the presence was noted of loose omental and visceral (small intestine) adhesions, which were finally dissected without lesions revealing the mesh with a creased edge and a loose staple in the posterior abdominal wall (Figures 2 and 3). The operation was completed via laparoscopy and the patient was discharged 8 h later with no intra- or postoperative complications and requiring analgesic treatment for 8 days. Twelve months after surgery she remains asymptomatic with no apparent recurrence (after physical examination and follow-up tomography).

Surgical technique

With the patient under general anaesthesia and in the decubitus supine position three trocars were placed along the mid-clavicular line: one 10-mm trocar for

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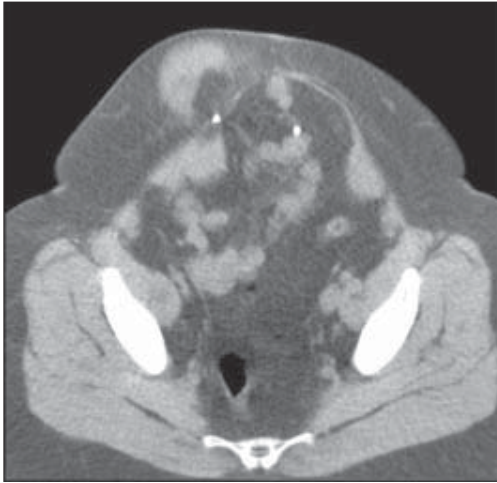


Figure 1: Computed axial tomography. Note the defect in the continuity of the mesh to the posterior abdominal wall, with a loose edge in the abdominal cavity



Figure 2: Image of the reoperation showing the failure in mesh fixation. Note the free vertex towards the intra-abdominal cavity with visceral adhesions on the small intestine

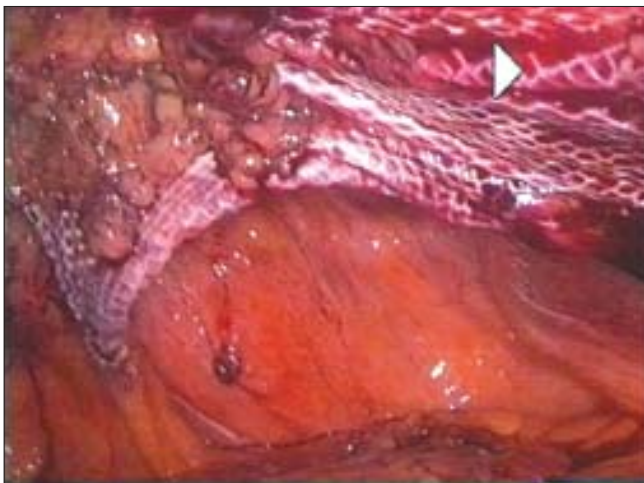


Figure 3: Image of the reoperation showing the failure in mesh fixation. Note a loose staple on the posterior abdominal wall

the subcostal telescope and two 5-mm trocars below. The size of the defect was assessed by intramuscular needles ($10 \times 8 \text{ cm}^2$, 62.8 cm^2) and traced on the skin with a 6–8-mm margin added around the whole perimeter. A $20 \times 15\text{-cm}^2$ double-layer mesh (Parietex® composite, Sofradim, Villefranche sur Saone, France) was prepared with a suture at each medial vertex and a long thread left for reference. Once inserted in the intra-abdominal cavity it was extended to ensure it was arranged correctly, and the two transabdominal reference sutures were pulled out with a Gore suture passer instrument (Gore-Tex®). The mesh was fixed with an external ring of nonreabsorbable helical suture (Pro-tack®, Tyco, USA) and an internal ring of I-clip reabsorbable suture (Pariefix), both in a clockwise direction. Several tractions were done on the mesh to check its fixation to the posterior wall. To finish the operation the trocars were removed under direct visual guidance, the two unknotted reference sutures cut and the pneumoperitoneum emptied.

DISCUSSION

The use of laparoscopy has become widespread in recent years as an alternative therapeutic method for correcting incisional hernias. Although, the technique has proved to be efficient and involve a low-morbidity rate, there are still controversial aspects such as recommended indications, whether or not to treat the herniary sac, whether or not to approach musculo-aponeurotic planes, type of mesh used, recommended fixation for the mesh, etc. The latter aspect is of particular interest, as it can lead to surgical failure due to early recurrence of the hernia. Leblanc recommends fixing the mesh using a combined technique of transmural sutures with staples despite the postoperative pain this may involve. In Leblanc's opinion this option is justified by a high rate of recurrence when using only a mechanical fixation.^[1] Heniford et al. also advocates this posture as a method of preventing recurrences.^[2] Berger and coauthors,^{[3]-[5]} however, prefer to use single fixation with mechanical suture, as they have had good results with recurrence rates, and the immediate postoperative period is improved by the reduction in pain and possibility of parietal haematomas. Our case clearly shows that mechanical suture is still not completely safe, and we therefore need to find new devices to improve rapid mesh anchorage to the posterior abdominal wall. Whilst waiting for technological development to offer us new and more reliable apparatus, we must recommend that any mechanical fixation be tested with mesh traction manoeuvres on the posterior abdominal wall and if necessary add more staples in areas of apparent failure or weakness. Furthermore, after several operations for recurrence fol-



lowing laparoscopic surgery we have seen that once the double-layer mesh is integrated without creases or folds, all the adhesions that form have been loose omental adhesions; however, if the mesh has creases then intestinal adhesions appear, something that might be explained by a possible mechanism of contact and friction during bowel movements. In such cases, surgery becomes far more complex (longer operating time) and may favour the appearance of a visceral lesion that is potentially serious for the patient. In conclusion (1) 'ideal mechanical fixation' does not yet exist and must always be tested before the operation can be considered completed and (2) folds or creases in double-layer meshes must be avoided as they seem to favour the formation of visceral adhesions.

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