

Laparoscopic Surgical Treatment of Umbilical Hernia and Small Eventrations with Prosthetic Mesh using Omentum Overlay

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Rezumat

Cura chirurgicală laparoscopică a herniei ombilicale și a eventrațiilor de mici dimensiuni cu allogrefă textilă placată cu epiplon

Introducere: Herniile ombilicale și eventrațiile abdominale postoperatorii reprezintă patologii de actualitate cărora li s-au atribuit numeroase modalități de rezolvare chirurgicală în variantă open surgery, miniminvasivă, tisulară sau protetică. Procedul propus de noi este o variantă mai puțin costisitoare și fără riscuri suplimentare comparativ cu alte procedee similare ca tehnica operatorie.

Material și metodă: Am efectuat un studiu retrospectiv pe perioada 01.01.2008 - 01.06.2013 în care am luat în calcul un număr de 23 pacienți cu hernie ombilicală și eventrație postoperatorie care au beneficiat de cură chirurgicală cu allogrefă textilă proepiploică cu placarea epiplonului, procedeu aplicat în Clinica Chirurgie II a Spitalului Clinic de Urgență Sibiu.

Rezultate: Pentru un număr de 23 pacienți cu hernie ombilicală și eventrație postoperatorie din care 16 hernii ombilicale și 7 eventrații am folosit această modalitate terapeutică, durata medie a intervenției chirurgicale fiind de o oră și 40 minute, înregistrând 4 complicații postoperatorii remise sub tratament conservator, cu o durată medie de spitalizare de 4,1 zile.

Concluzii: Tratatamentul laparoscopic cu montarea protezei

proepiploic reprezintă o alternativă fezabilă față de un procedeu mai scump și mai dificil tehnic cu allogrefă Dual Mesh.

Cuvinte cheie: hernie ombilicală, eventrație postoperatorie, miniminvasivitate, abord laparoscopic, placarea allogrefei textile cu epiplon

Abstract

Introduction: Umbilical hernias and abdominal incisional hernias represent current pathologies which require numerous surgical alternative ways of treatment in prosthetic or non-prosthetic, open or minimally invasive surgery. The method proposed by us is a less expensive option with no additional risks compared to other similar procedures as surgical technique.

Materials and methods. We conducted a retrospective study between 01.01.2008 - 01.06.2013 in which we considered a number of 23 patients with umbilical hernia and eventration, patients who received laparoscopic intraperitoneal polyester mesh covered with omentum, procedure applied at the IInd Surgery Clinic, Clinical County Emergency Hospital Sibiu.

Results: Out of 23 patients with postoperative umbilical hernia and eventration cases in which we used this surgical technique, 16 were umbilical hernias and 7 post incisional hernias. The average time of surgery was 1 hour and 40 minutes, recording 4 postoperative complications remitted under conservative treatment, with a mean hospitalization of 4.1 days.

Conclusions: Proepiploic laparoscopic treatment using omentum is a reliable alternative to a more expensive and difficult procedure involving Dual Mesh.

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Key words: umbilical hernia, postincisional hernia, minimally invasive, laparoscopic approach, overlaid omentum mesh

Introduction

Abdominal wall defect treatment has been an ongoing concern, surgical solutions being in a continuous innovative dynamic.

Ebers Egyptian Papyrus (1552 BC) is the first documented evidence of umbilical hernia, the first detailed description appears in Charaka, an old Indian document, and the first description of umbilical hernia surgical cure belongs to Abdul Qasim al-Zahrawi. (1,2)

Although abdominal wall incisional hernias are described only from the late nineteenth, early twentieth century, awareness of the risk dates back to ancient times. Umbilical hernias represents approximately 6% of all abdominal hernias. Postoperative incisional hernia has a relatively low incidence under local favorable evolution (1-3%), its incidence being increased significantly to 25-50% in postoperative evolutions complicated with wound infection.

The therapy for these two types of parietal defects has known numerous ways of surgical repair both in tissular and prosthetic approach. Surgical treatment in "open surgery" of umbilical and incisional hernias acquired in the last decades minimally invasive surgery as an alternative, more frequently its laparoscopic variant.

The first description of a laparoscopic parietal repair procedure was made in 1992 by Karl Leblanc, and the technique was published a year later in 1993. The technique of laparoscopic ventral hernia repair (LVHR) became commonplace about 10 years later when the first wider studies appeared. The procedure proposed in this article has been published in 2010 by a team from Lahore Pakistan led by Dr. Muhammad Farooq Afzal (3).

Materials and Methods

We conducted a retrospective study over a period of 4 years and 6 months between 2009 and 2013 on a total of 217 cases with the diagnosis of umbilical hernia and abdominal postoperative incisional hernia patients hospitalized in the Sibiu Surgery Clinic II. 124 of the cases studied were postoperative incisional hernias, 93 cases were umbilical hernias.

Laparoscopic proepiploic mounted mesh approach with great omentum lining was applied to 16 cases with the diagnosis of umbilical hernia and 7 cases of postoperative incisional hernias.

Cases coming in acute complicated phase (incarceration, strangulation) have not benefitted from laparoscopic mesh repair with epiploic lining.

The parameters analysed were: parietal defect dimensions, localization (for incisional hernias), the average length of

surgical intervention, intraoperative accidents/complications, average length of hospitalization, socio-professional reintegration, the rate of recurrence.

Preoperative therapy with antibiotics was reserved only for selected cases (patients with ascites, chronic bronchitis etc). Deep venous thrombosis prophylaxis is assured by 5000 units of subcutaneous heparin in the day before surgery, and by sequential leg compression. After general endotracheal anesthesia is induced, an orogastric tube and Foley catheter are placed.

The pneumoperitoneum is achieved with a Veress needle insertion, mostly inserted in the left upper quadrant 3 cm inferior to the left costal margin in the midclavicular line (Palmer's point). Alternative sites include the right hypocondrium and the right or left iliac fossae depending on the parietal defect placement. (4,5)

A 10 mm port is placed percutaneously at a point along the anterior axillary line away from the edge of the abdominal defect. We use a 30° laparoscope providing a wider field of vision placed through the 10 mm port. One or two (more often two) additional 5 mm ports are placed under direct vision, avoiding proximity with the anterior superior iliac spine, which can hinder the mobility of the instruments. Laparoscopic examination of the abdomen is performed, any abnormalities are noted after inspection of abdominal wall for additional hernias, the great omentum's dimensions and quality. Under conditions of low dimensions or poor quality of great omentum we prefer a DualMesh prosthesis. (Fig. 1)

For large, complex hernias a fourth trocar can be placed on the opposite side of the abdomen. Typical instruments for laparoscopic surgery are used, adding EndoClose forceps, Reverdin's needle and LigaSure sealing instrument for a better hemostasis control. If there are no contraindications the incarcerated content is reduced. No attempt is made to remove the hernia sac.

An appropriate size mesh is chosen or tailored to adequately close the defect, with an overlap of 2-4 cm circumferentially. We use Nylon 8 wires anchored at the mesh extremities. The mesh is rolled and inserted through a 1 cm port into the abdominal cavity, and then unrolled in the abdominal cavity. Using EndoClose forceps and Reverdin's needle the sutures are pulled transabdominally through small skin incisions. The sutures are pulled tight and the mesh is raised to the abdominal wall. The anchoring sutures are tied in the subcutaneous tissue, further skin traction placing them on the abdominal muscles' aponeurosis. (Fig. 2)

The posterior face of the mesh is tackled with the omentum, and depending on hemostasis quality we optionally insert a drainage tube in Douglas' sac. (Figs. 3, 4)

Results

The study was focused on the group that received minimally invasive surgical treatment in laparoscopic approach.

Laparoscopic approach using proepiploic mesh accounted overall for the two diseases for 10.59% of all surgical treatment methods. Depending on the size of the abdominal wall defect,

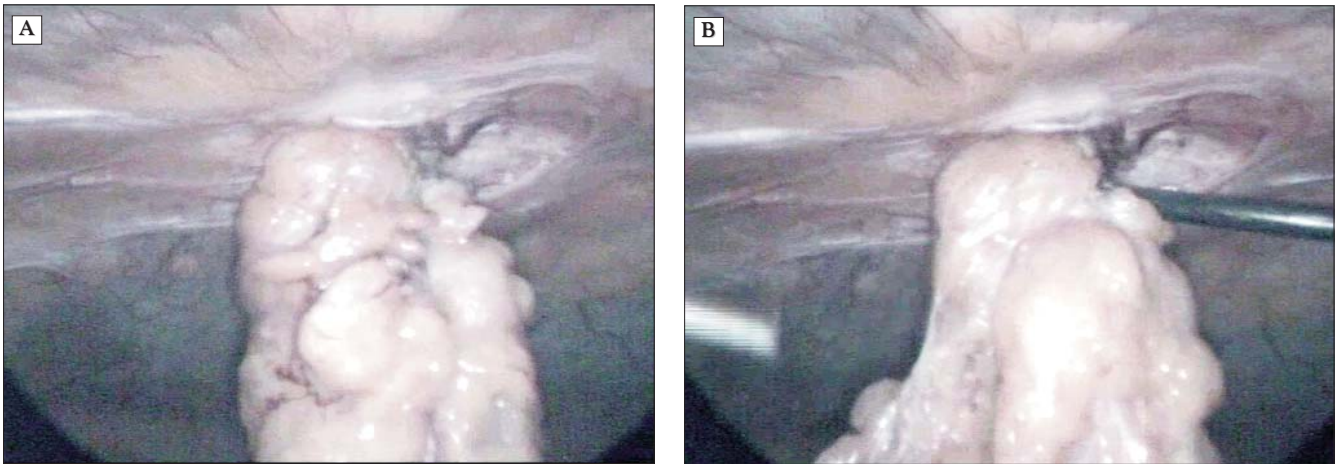


Figure 1. Endoperitoneal images- hernia sac and laparoscopic adhesiolysis maneuvers (IInd Surgery Clinic Sibiu collection)

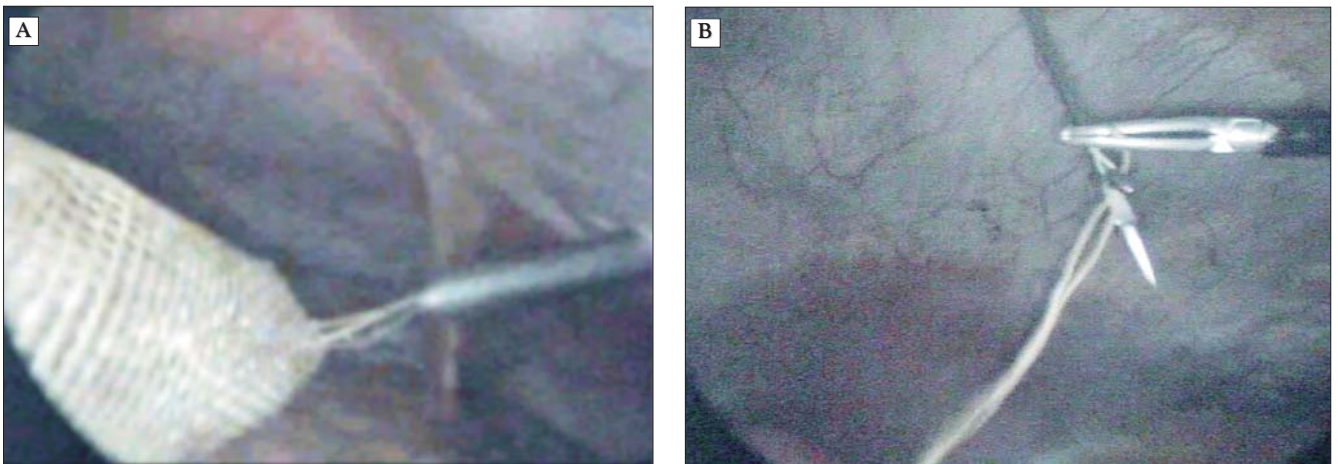


Figure 2. Mesh introduction and anchoring (IInd Surgery Clinic Sibiu collection)

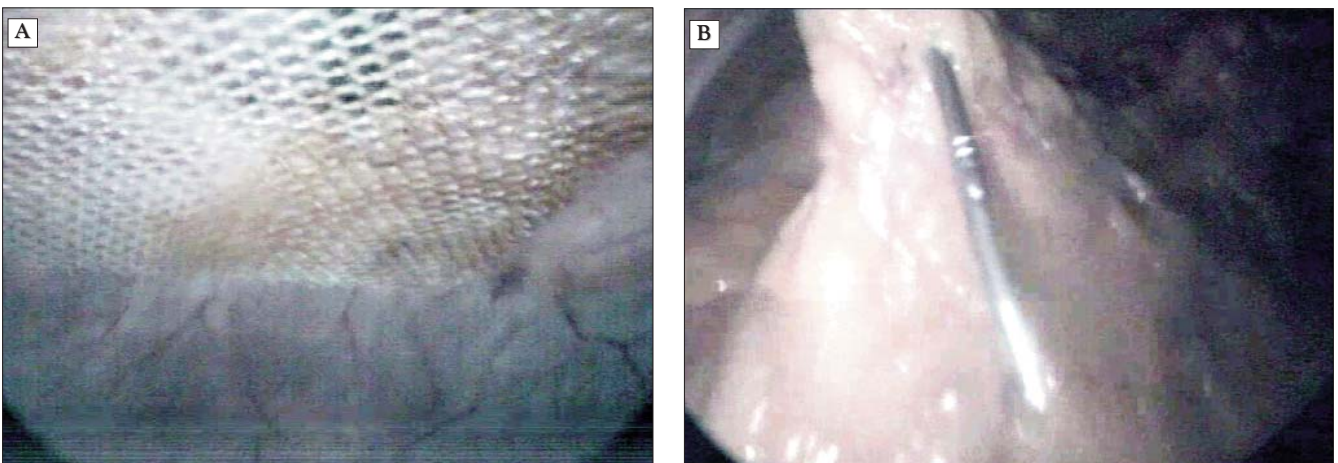
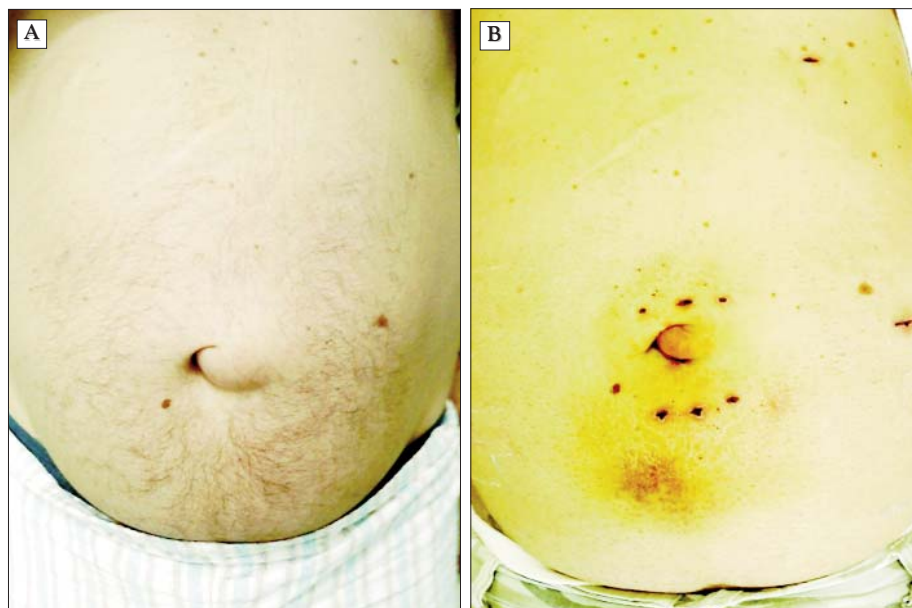


Figure 3. The appearance of the prosthesis and its subsequent overlaid omentum (IInd Surgery Clinic Sibiu collection)

distribution for umbilical hernia was: 4 cases under 2 cm, 7 cases with sizes between 2-4 cm, 3 cases with sizes between 4-6 cm, 2 cases with parietal defects ranging between 6-8 cm.

Parietal defect dimensions for post incisional hernias were: 5 cases with sizes under 5 cm, 2 cases with sizes between 5-7 cm, more frequently their location being 71.42% in the upper

Figure 4. Pre- and postoperative appearance
(IInd Surgery Clinic Sibiu collection)



abdomen, 28.57% in the lower abdomen.

The average duration of surgical intervention was one hour and forty one minutes, higher than in open surgery where the average time calculated was one hour and thirteen minutes. Post incision hernia treatment required a longer duration of surgery, an average of 2 hours and 7 minutes compared with average time for umbilical hernias (1 hour and 15 minutes), due both to adherential syndrome adhesiolysis and additional hemostasis, in three situations preferring Douglas drainage.

No intraoperative complications occurred, in the immediate postoperative period we had two cases of seroma and two cases with algic syndrome remitted under conservative treatment. None of the cases required conversion to open surgery. The average hospitalization stay was 4.1 days compared to 6.4 days in open surgery approach.

Follow-up surveillance for complication recurrence and socio-professional reintegration was performed at 2 weeks, two months and 6 months after discharge remarking a quicker social reinsertion, a much higher aesthetic benefit compared to open surgery. In nine cases we didn't have a follow-up at six months. We had no data to suggest cases of recurrence using this technique.

Discussions

These two pathologies involve, beside extrinsic factors, elements of regional anatomical architecture, elements that properly understood can benefit from adequate sanction in open or minimally invasive surgery approach.

Basically, all ventral hernias can be repaired by laparoscopy as the standard procedure, although various factors do place limits on laparoscopic repair, such as the size of the defect and the point where it has occurred. Emergency cases must be analysed case-by-case to assess whether laparoscopic operation should be performed. (6,7). This procedure

involves laparoscopic intraperitoneal fitting of the prosthetic mesh.

This technique summarizes the advantages of laparoscopic tissular and prosthetic repair of the abdominal wall. Laparoscopic approach has a significant contribution in preventing recurrence risk by avoiding postoperative oversizing of the parietal defect, risk often encountered in open surgery, because the tension in the suture is proportional to the size of the incision. Another advantage is represented by the internal abdominal wall placement of the mesh without a significant incision through parietal muscles, procedure which increases abdominal parietal resistance.

The main disadvantages of this type of intervention are that it is addressed to early lesions (small and medium dimensions), increased cost of instruments, longer operative time, the requirement of general anaesthesia, pregnancy, etc.

The margins overlapping the parietal defect in our study were between 2 and 4 cm, considering these values sufficient for the addressed defects, as well as the necessity of a complete mesh coating with omentum (8,9,10). The fixing mode of the prostheses and their nature is still a subject of controversy. An ideal mesh in laparoscopy should be as inert as possible in contact with the visceral peritoneum.

Frequently polypropylene or polyester macro porous prostheses are used, with opinions that this type of prosthesis predisposes to intestinal fistulas. In our experience with omentum, overlapping prevents evolution to such complications, by preventing adhesions between the mesh and abdominal viscera, with results comparable with Dual Mesh prosthesis (11,12,13). Dual Mesh prostheses represent the standard choice in surgical treatment of umbilical and post incisional hernias, but are more difficult to access due to a higher acquisition cost, being also harder to handle during surgery (14).

Limitations of the method lie in the impossibility of a

correct mesh fitting in large abdominal defects, in the necessity of a sufficient size and quality of omentum, to prevent complications, situations in which we prefer Dual Mesh.

We consider that this modality of umbilical and post incision hernia treatment resembles a Dual Mesh approach, with additional benefits from a classic surgical approach, but in lack of a bigger study group and not having a significantly statistic group with Dual Mesh prosthesis for comparison, as well as the fact that we've used this technique only for small and medium defects determine us to be reserved in our final conclusions.

Conclusions

The minimally invasive laparoscopic treatment of umbilical hernias and post incisional hernias, using intraabdominal mesh overlay with great omentum, is a feasible alternative to a more expensive and difficult Dual mesh procedure. Minimizing the risk of complications occurring due to mesh – abdominal viscera contact by omentum overlay, it is a technique which gave us satisfaction every time we used it.

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