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Research Article

Laparoscopic IPOMPLUS repair-current outcomes and complications

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Abstract

Purpose: The study aims to assess the current outcomes and complications of laparoscopic ventral hernia repair using intraperitoneal onlay mesh with defect closure (IPOM PLUS) technique by use of dual-sided synthetic mesh.

Material and methods: Retrospectively clinical data for 27 patients with umbilical, paraumbilical, incisional, ventral, and primary hernia, operated in the Department of General, Visceral and Emergency Surgery "Pirogov" from 01.06.2022 to 01.06. 2022 was analyzed. The diagnosis was based on history, physical examination(mainly), ultrasound, and CT. Of the hospitalized, women were 16 (59.26%) men 11 (40.74%).

Results: Of the selected group, 13 patients had umbilical defects, 3 with an epigastric hernia, 7 with a paraumbilical hernia, and 4 with incisional defects. Adhesiolysis was needed in 18 cases, while others were performed straight with hernia closure. The operating time varied between 49 and 127 minutes (average 57.4 minutes). The hospital stay ranged from 1 day to 4 days (average 1.7 days). We had noticed complications in three of the cases (11.11%).

Conclusion: IPOM PLUS repair is safe, practicable, and advantageous over a standard IPOM or open repair as reported in the literature. Accordingly, we prefer this approach with the closure of the fascial defect first while repairing ventral abdominal wall hernias.

Keywords

ventral hernia, IPOM, laparoscopic surgery, approach, complications

Introduction

In recent decades, minimal access surgery for ventral herniarepair has become popular. However, several issues like postoperative pain, recurrence, and seroma formation, arosedue to this procedure and had to be resolved. To find a solution to the mentioned issues, closing the defect in the fascia laparoscopically along with reinforcement by mesh has been performed.

A ventral hernia is an anterior abdominal wall hernia, which excludes inguinal hernia. Ventral hernias, whether naturally occurring or the result of previous surgery,

comprise one of the most common problems in general surgery, with an overall incidence between 2% and 13% (Lomanto et al. 2006; Hussain et al. 2008).

Ventral hernia repair underwent a progressive development and evolution nowadays. It was initially performed by the open technique to restore the anatomical layers without mesh insertion, and the recurrence rate could range from 31% to 54% (Luijendijk et al. 1997). The first laparoscopic ventral hernia repair was represented by LeBlanc et al, in 1993 (LeBlanc and Booth 1993). This minimally invasive approach was improved over the last decade and is an optimum choice for this pathology nowadays. With fewer wound complications, faster functional recovery, and improved cosmetic results, it has become a first-choic-esolution in ventral hernia treatment. However, there are still some unresolved issues, including a certain number of relapses, problems withthe fixation of the mesh, the choice of the mesh, and the incidence of seromas. Primary closure of the hernial defect is desirable, although sometimes is technically complicated, as shown by previous experience.

The goals of ventral hernia repair are relief of patient symptoms and hernia defect closure with minimization of recurrence rates. While laparoscopic ventral hernia repair has gained popularity in recent years, there is still significant controversy about the optimal surgical approach to defect closure.

Another surgical technique, similar to the IPOM-plus approach (where the hernial defect is closed by suture), uses part of the peritoneum which could be dissected up to the midpoint of the hernial sac to create a peritoneal fap used to bring down the hernial sac and suture it intra- abdominally before mesh application. Compared to conventional IPOM-plus, this IPOM- peritoneal bridging approach may lead to reduced postoperative seroma formation (due to the eradication of the dead space created by the hernial sac). Prevention of surgical tension created by suturing the hernial defect should reduce postoperative pain, discomfort, and fatigue. The benefits of less mesh bulging and recurrence rates due to the large intra-abdominal attachment area for mesh application after hernial defect closure are sustained (Bernardi et al. 2020; Christofersen et al. 2020).

This study aims to assess the current outcomes and complications of laparoscopic ventral hernia repair using intraperitoneal onlay mesh with defect closure (IPOM PLUS) technique by use of dual-sided synthetic mesh.

Material and methods

Retrospectively clinical data for 27 patients with umbilical, paraumbilical, incisional, ventral, and primary hernia, operated in the Department of General, Visceral and Emergency Surgery "Pirogov" from 01.06.2022 to 01.06.2022 was analyzed.

The diagnosis was based on history, physical examination (mainly), ultrasound, and CT. Of the hospitalized, women were 16 (59.26%) men 11 (40.74%).

In this study, the parameters – age, gender distribution, clinical symptoms, mode of treatment, morbidity, and mortality were followed. Age in this retrospective analysis varied from 21 to 65 years (average 42.3 years).

Four of the patients (14.81%) had preoperative painful compaction of tissue in hernial defect (omentum accreted).

Indications of IPOM

- Umbilical/Epigastric/Paraumbilical
- Incisional/Ventral
- Primary hernia
- Size up to 5 cm

Contraindications to laparoscopy in general

- Shock
- Cardiopulmonary compromise
- Pregnancy

Contraindications specific to IPOM

- Large defect with Loss of Domain (LOD)
- Abdominal skin grafts
- Need to remove sizeable prosthetic mesh
- Active entero-cutaneous fistula
- Gangrenous bowel
- Fecal peritonitis
- Intra-abdominal sepsis
- Cirrhosis with caput-medusae

We utilized the standard technique with three trocars.

1. Verres needle or Hassan open entry or direct view trocar entry (left subcostal)
2. Diagnostic laparoscopy
3. Adhesiolysis and reduction of contents
4. Measure defects with low IAP
5. Choose mesh size
6. Sac "bite" to prevent seroma
7. Defect closure at low pneumoperitoneum
8. Suture defect-non absorbable barbed suture
9. Mesh deployment and fixation (Low PNU+prot-acks)
10. Centering stitch (PDS)
11. Omentum between mesh and bowel

Possessed data were statistically determined using SPSS version 19.0. The results were summarized by tracking the morbidity up to three months post-discharge.

Table 1. Gender distribution.

Gender distribution	27 (100%)
Women	16 (59.26%)
Men	11 (40.74%)

Results

Of the selected group, 13 patients had umbilical defects, 3 with an epigastric hernia, 7 with a paraumbilical hernia, and 4 with incisional defects (Table 2).

Table 2. Surgical identification.

Surgical identification	27 (100%)
Umbilical	13 (48.15%)
Epigastric	3 (11.11%)
Paraumbilical	7 (25.93%)
Incisional/Ventral	4 (14.81%)

Adhesiolysis was neededin 18 cases, while others were performed straight with hernia closure (Table 3).

Table 3. Where adhesiolysis was needed.

Adhesiolysis	27(100%)
Needed	18(66.67%)
No Need	9(33.33%)

The operating time varied between 49 and 127 minutes (average 57.4 minutes).

The hospital stay ranged from 1 day to 4 days (average 1.7 days).

We had noticed complications in three of the cases (11.11%). The first patient had with seroma sign-drained with a small puncture. In the second one, we had a wound infection, healed with a dressing. The third case was with subileus symptoms, managed with conservative treatment (Table 4).

Complications also affected comorbidity. Some of the patients had arterial hypertension, diabetes, and obesity.

Table 4. Complications.

Complications	3 (11.11%)
Seroma	1 (3.7%)
Wound infection	1(3.7%)
Subileus	1 (3.7%)

No data on deaths. The mortality rate for all patients was 0%.

Discussion

Surgery for ventral abdominal wall hernias by laparoscopic approach is gaining popularity over the last decades and it is recognized by many general surgeons and hospitals globally.

Researchby many authors accepted that laparoscopy is a successful and safe procedure for ventral hernia repair in various aspects. Some of them are reduced hospital stay, lower postoperative complications, a decreased rate of wound infection, and recurrence.

The techniques for ventral hernia repair can be continuous and interrupted, and also intracorporal or extracorporal. In extracorporal technique, puncture wounds are made on each side of the defect and the suture material is passed to take stitches in an interrupted approach. A common complication is a granuloma. Also, the rate of infection and cosmetic dissatisfaction are higher in this mode (Colon et al. 2013).

In this research, we analyzed postoperative pain, other complications like seroma, return to regular activity, and recurrence rates between patients undergoing IPOM PLUS and those with open surgery.

On average postoperative pain in patients undergoing IPOM PLUS showed a gradual decrease from the first 24 hours compared to those with open surgery (Clapp et al. 2013).

The operative time taken to complete the surgery was 58 minutes for IPOM PLUS which is almost equal tothe open approach.

The mean duration of hospital stay was 1.7 days in patients who underwent IPOM PLUS and 4.3 days in patients who underwent open procedures respectively which was found to be statistically significant. This was supported in other world studies.

Seroma was the most indicated problem after a laparoscopic ventral hernia repair. Incidence ofseroma was significantly less among the patients who underwent IPOM PLUS which was 2.6% and comparatively more with the IPOM world reported group with 14.7%. The predictive risk factors for seroma are BMI (obesity), previous surgery, size of defect, and immoderate use of cauterization.

Return to regular activity and ability to carry out routine work without difficulty was attained by 3.8 weeks in patients who underwent IPOM PLUS procedure and the same was attained by 7.9 weeks on average in patients who underwent open procedure for hernia repair. This conclusion was statistically significant and has been mentioned in many studies.

Conclusion

The analyzed data from our study showed that IPOM PLUS was associated with a lower rate of postoperative complications compared to IPOM and open techniques.

IPOM PLUS repair is safe, practicable, and advantageous over a standard IPOM or open repair as reported in the literature. Accordingly, we prefer this approach with the closure of the fascial defect first while repairing ventral abdominal wall hernias.

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