Comparison between intraperitoneal onlay mesh repair with closure of fascial defect (IPOM plus) and intraperitoneal onlay mesh repair (IPOM) for ventral hernias

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Aim. To evaluate the intraperitoneal onlay mesh repair with closure of fascial defect (IPOM plus) versus intraperitoneal onlay mesh (IPOM) for ventral hernias (VHs).

Materials and methods. A total of 89 patients with VHs with a defect between 3–12 cm who underwent a surgery from 2018 to 2023 years were enrolled in this study. All of them were randomly assigned to two groups. Group 1 included 45 patients after intraperitoneal onlay mesh repair with closure of fascial defect (IPOM plus), Group 2 – 44 patients after intraperitoneal onlay mesh (IPOM). The distribution of patients by age, sex, body mass index (BMI), hernia type (primary VH, incisional hernia), American Society of Anesthesiologists (ASA) score was studied.

Results. The differences in sex, mean age, patient distribution based on hernia type, BMI, ASA score and hernia orifice size were not statistically significant between the two groups. Therefore, both groups were comparable. The operative time in minutes was 73.17 ± 7.43 in Group 1 and 70.93 ± 8.84 in Group 2 (not statistically significant). The pain score 12 hours after surgery was 5.24 ± 0.60 in Group 1 comparing to 5.02 ± 0.45 in Group 2 (not statistically significant). The pain score 8 days after surgery was 2.88 ± 0.31 in Group 1 comparing to 2.75 ± 0.43 in Group 2 (not statistically significant).

There was no significant difference concerning the incidence of early complications between the two groups. 41 (91.1 %) patients of Group 1 and 40 (90.9 %) patients of Group 2 were examined during a 22-month follow-up period. No complications were noted.

Conclusions. Laparoscopic ventral hernia repair provides satisfactory results in terms of safety and efficacy. Thus, IPOM plus repair is safe, feasible and offers advantages over the standard IPOM technique as reported in the literature. Poor outcomes described in the literature are probably related to independent variables such as mesh and suture types as well as closure technique.
Abdominal wall defects are a common surgical presentation and indication for surgery worldwide with an estimated prevalence of about 5% in the general population [1,2].

The rising incidence of ventral hernias (VHs), basically, is driven by an increasingly obese population, a larger number of abdominal surgeries and ageing. VHs may be asymptomatic. VH symptoms such as pain and discomfort can significantly impact quality of life and definitively be associated with impaired body image. In addition, there are risks of bowel obstruction, incarceration, and strangulation.

Since Karl Leblanc introduced laparoscopic VH repair (LVHR) in 1993 [3], it has steadily gained recognition as an alternative to open VH repair due to better postoperative outcomes [4,5].

Aim

To evaluate the intraperitoneal onlay mesh repair with closure of fascial defect (IPOM plus) versus intraperitoneal onlay mesh (IPOM) for VH.

Materials and methods

A total of 89 patients with VHs with a defect between 3-12 cm who underwent a surgery in Private Enterprise “Clinic “Medicom” (Kyiv) from 2018 to 2023 years were enrolled in this study. All of them were randomly assigned to two groups. Group 1 included 45 patients who underwent intraperitoneal onlay mesh repair with closure of fascial defect (IPOM plus). Group 2 – 44 patients who underwent intraperitoneal onlay mesh (IPOM). The distribution of patients by sex, hernia type, ASA score, hernia orifice size were not statistically significant between the two groups.

Results

There were 45 males and 44 females. Table 1 shows that differences in sex, mean age, distribution of patients based on hernia type, BMI, ASA score, hernia orifice size were not statistically significant between the two groups. Therefore, both groups were comparable.

<table>
<thead>
<tr>
<th>Group</th>
<th>Patients</th>
<th>Mean Age (years)</th>
<th>BMI (kg/m²)</th>
<th>ASA Score</th>
<th>Hernia Type</th>
<th>Hernia Orifice Size (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>45</td>
<td>55</td>
<td>25</td>
<td>3</td>
<td>VH</td>
<td>4</td>
</tr>
<tr>
<td>Group 2</td>
<td>44</td>
<td>56</td>
<td>24</td>
<td>3</td>
<td>VH</td>
<td>5</td>
</tr>
</tbody>
</table>

Surgical outcomes are shown in Table 2.

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean Operative Time (min)</th>
<th>Mean Pain Score 8 Days</th>
<th>Mean Pain Score 12 Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>73.17 ± 7.43</td>
<td>2.88 ± 0.31</td>
<td>5.24 ± 0.60</td>
</tr>
<tr>
<td>Group 2</td>
<td>70.93 ± 8.84</td>
<td>2.52 ± 0.60</td>
<td>5.02 ± 0.45</td>
</tr>
</tbody>
</table>

Discussion

Older adults are at increased risk of developing VH due to weak anterior abdominal wall and impaired mechanisms of tissue repair.

Hence, S. G. Parker et al. [6] have identified three patient variables (female sex, age 65 years or less, and BMI higher than 25 kg/m², 30 kg/m², 35 kg/m² or 40 kg/m²), 5 patient co-morbidities (smoking, diabetes mellitus, chronic obstructive pulmonary disease, ASA grade III–IV, steroid
usage), two hernia-related variables (incisional / primary, recurrent / primary), six intraoperative variables (biological mesh, bridged repair, open as opposed to laparoscopic surgery, suture as opposed to mesh repair, onlay / retrorectus, intraperitoneal / retromuscular) and six postoperative variables (any complication, surgical-site rate, wound infection, seroma, hematoma, wound dehiscence) as significant prognostic factors for VH recurrence. Progressively increasing risk of VH formation with each increase in BMI above 25 kg/m² has also been documented [7].

However, there is some controversy over different approaches to LVHR. The popular laparoscopic approach is IPOM repair, when IPOM is placed with at least a 5 cm overlap to cover the hernia defect (without a defect closure) [3]. Nevertheless, this approach creates space between the mesh and the overlying hernial sac, which is believed to be the cause of seroma formation [8]. Age had no effect neither on seroma nor on recurrence in the study of F. Muysoms et al. [9], but was associated with a longer length of hospital stay in patients over 65 years.

In a study by Dimitrios Prassas et al. [10], laparoscopic IPOM combined with electric cauterization of the hernia sac significantly reduced the rate of postoperative seroma compared to the IPOM technique in patients with ventral and incisional hernias, which is inconsistent with our study results.

Postoperative hematomas are considered among the most serious complications. In our study, we have observed one port-site hematoma case (1.12 %) in an obese patient who was successfully managed by cauterization. Hematoma prevalence is estimated to be between 0.4 % and 4.0 % in the literature [11,12].

We agree with S. G. Parker [13] that a significant increase in VH defect width is positively correlated with higher recurrence rates.

LVHR is a preferred procedure to correct abdominal wall defects. Seroma and recurrence are the main postoperative complications which are related to obesity. Other complications, such as chronic pain, ileus, and hematoma occur less frequently and can be avoided by following the international guidelines for LVHR.

Closure of fascial defect appears to decrease postoperative morbidity and give chance for good mesh fixation. Several reports have indicated the effectiveness of IPOM plus [14,15,16], and a recent systematic review has concluded that IPOM-plus was more effective than IPOM [17,18].

The underlying mechanism that causes tension on the suture line of the fascial closure is the nonfunctioning central portion of the abdominal wall that can protrude into the hernia sac due to intraabdominal pressure. To circumvent these problems, the International EndoHernia Society guidelines suggest that IPOM-plus may produce less tension on the suture line of the fascial closure [19,20].

**Conclusions**

1. Laparoscopic ventral hernia repair provides satisfactory results in terms of safety and efficacy. Thus, IPOM plus repair is safe, feasible and offers possible advantages over the standard IPOM repair as reported in the literature.

2. Inconsistent results in the literature are probably related to independent variables such as the type of mesh, suture and closure techniques.

**Conflicts of interest**: authors have no conflict of interest to declare.

**References**

References


