

To Compare Outcome of Open Versus Laproscopic Repair for Primary Ventral Hernias

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ABSTRACT

Background: Primary ventral and incisional abdominal wall hernias are frequent conditions that necessitate surgery, and both types of hernias can be treated utilizing an open or laparoscopic technique. Improvements in laparoscopy have also been linked to a decrease in pain scores.

Methodology: A dual setting study was conducted from July 2017 to June 2019 at Peshawar medical college with collaboration of Lady Reading Hospital and Hayatabad Medical Complex, Peshawar and was conducted on a total of 120 patients who were diagnosed with ventral hernia. A random number table created by a computer indicated repair of an open ventral hernia technique (group 1, n = 60) or laparoscopy (group 2, n = 60).

Results: Among 60 patients in the laparoscopy group, there were 37 cases of PUH, 15 cases of epigastric hernia, 8 cases of umbilical hernia, and among 60 cases of open abdominal hernia, including 31 cases of PUH, 19 cases of hernia in the abdomen. upper abdomen, and 10 cases of umbilical hernia. Wound-related complications were most commonly seen in the open procedure group of patients.

Conclusion: This has led to broad acceptance of the laparoscopic surgery, and advantages particularly in order to decrease the post-operative mortality and morbidity, time of operation, bleeding and the duration of hospital stay along the ability to execute the surgery on the obese people and with abdominal scarred individuals.

Keywords: Incisional hernia, Laparoscopic mesh repair, Open mesh repair, Primary ventral hernia.

INTRODUCTION

Incisional hernias develop at the site of any previous operation through abdominal wall muscle, whereas primary ventral hernias occur in a virgin abdomen and include epigastric, umbilical and paraumbilical, subcostal, lumbar, and flank hernias. Incisional hernia is reported to occur between 2% and 20% of the time after abdominal surgery (1). Primary ventral and incisional abdominal wall hernias are frequent conditions that necessitate surgery, and both types of hernias can be treated utilizing an open or laparoscopic technique.(2)

Several meta-analysis have shown that incision laparoscopy and abdominal hernia repair are viable and effective alternatives to open procedures and have lower wound complication rates (3,4). In this meta-analysis comparing hernia repair with laparoscopy and open technique, data were collected for primary (umbilical, epigastric) and secondary (incision) hernias (5).

There has been a growing discussion about the best procedure for ventral hernia repairs with the introduction of laparoscopic surgery and minimally invasive hernia repair procedures (1-4).

Most meta-analyses compared to laparoscopic hernia repair and open procedure showed that short-term recurrence rates were the same (1, 2, 6, 7) and quality of life (QOL) for postoperative pain 6 months postoperatively were the same. Equivalent (8). Numerous studies show that minimally invasive methods to repair abdominal hernia can shorten hospitalization, surgery time, wound complications and reduce overall complication rates (4, 5, 9)

The larger of the two meta-analysis, based on six randomized controlled trials (RCTs) with up to 751 patients, showed a statistically significant decrease in laparoscopic wound complications compared with open-sectional hernia repair (10, 11). However, the incidence of intestinal complications in laparoscopic surgery is quite high (12).

Abdominal incision hernia is a common problem after abdominal surgery, with a reported incidence of about 11% (13). It is estimated that the United States spends about \$ 3.4 billion a year repairing hernia (14). Abdominal hernia repair can be performed with laparoscopy or open surgery. A meta-analysis and a randomized controlled trial showed that both methods were

equivalent in terms of the rate of recurrence and reduction of wound complications in laparoscopic surgeries (15). Improvements in laparoscopy have also been linked to a decrease in pain scores (16).

Several laparoscopic abdominal hernia repairs have yielded outstanding results. But, published comparative results contradict and suggest that further research is needed. This study was conducted to find and the compare the factors of open ventral hernia (OVH) and laparoscopic ventral hernia (LVH).

METHODOLOGY

A dual setting study was conducted from July 2017 to June 2019 at Peshawar medical college with collaboration of Lady Reading Hospital and Hayatabad Medical Complex, Peshawar and was conducted on a total of 120 patients who were diagnosed with ventral hernia. A random number table created by a computer indicated repair of an open ventral hernia technique (group 1, n = 60) or laparoscopy (group 2, n = 60). This study does not include patients with a hernia below 3 cm and emergencies.

There is no trend like the open technology. Before the surgery, all the patients with incisional hernias had the mechanical bowel preparation and to received intravenously about one gram of sulbactam-ampicillin. All the patients received subcutaneous low dose heparin (0.5 mg/kg Enoxaparin) prior to surgery. General anaesthesia was used for all type of surgical operations. Decompression was accomplished with the insertion of Foley urine catheters and the nasogastric tubes. On first and second post-operative day, all the patients administered same non-steroidal anti-inflammatory medicine (8 mg lornoxicam, intravenously twice daily) and the narcotic painkiller (50 mg pethidine, intramuscularly three times daily). Following that, oral analgesics were also used to give analgesia (1 g metamisol sodium, thrice a day). Patients of both the groups had their pain assessed during the hospital stay and the conclusion of the first post-operative week.

Group 1: For open technique: The abdominal fascia was covered with onlay polypropylene mesh. At least 5 cm distant from the fault borders, the fascia was dissected. Separate non-absorbable sutures were used to attach the polypropylene mesh.

All of the patients had aspirative suction drains installed, and the skin was stapled shut. The suction drain tubes were removed if the daily drainage was look less than the fifty milliliter. The patients demographic, operation timeframes, hernia locations, BMIs, durations of hospital stay, and fascial defect diameters, the severity and presence of post-operative pain, along with the post-operative mild and severe complications were also evaluated and compared.

Group 2: Laparoscopic surgery: All cracks were approached from the side, and port location was done on the ventral side away from the crack defect. Use the Veres needle to pass through the left quarter of the upper abdomen to form the pulmonary peritoneum. Three Trucara cars are considered sufficient for all processes. The video oscilloscope port is 10 mm in diameter, and two other 5 mm in diameter ports. The abdominal cavity should be fully examined and herniated malformations identified. After the adhesions dissolve, the edges of the hernia defect are clear, and the peritoneum remains in place. Expanded polytetrafluoroethylene (double mesh), HA-CMC-coated polypropylene gauze or polyurethane and polyester a net network. Adjust the tissue to cover the margins of all three-centimeter cracks. To anchor the abdominal wall mesh, a non-absorbable transfusion suture (Prolene 2.0) and adhesive titanium (Protack, USA) was employed. Instead of pins, four patients used anchor sutures. In both cases, the mesh was secured with nails using the Double Crown approach (Protack). The transfacial suture was applied with a suture retention device. At the start of the surgery, the appealing defect established at the 10 mm port position was sutured with thick non-absorbable sutures. A sterile strip is used to seal the suture. Drainage isn't in place.

After discharge, the patient will be monitored every week, 4 weeks, 12 weeks and 6 months. All information is recorded prospectively into a pre-built Performance for each patient.

All data in our study are reflected as mean and standard deviation. The Wilcoxon and chi-square test were used for statistical analysis.

RESULTS

In this study, 120 patients with primary abdominal hernia were randomly assigned to one of two groups: open hernia repair (group 1) or laparoscopic hernia surgery (group 2). In the first group 13 men and 47 women, and in the second group 21 men and 39 women. The mean age of the two groups was similar. Group 1 was 44.71 (range, 23 to 67 years) and 46.08 (mean BMI was 24.97 (range, 17 to 48.9) in groups 1 and 26.67 (range, 17.72 to 42.02) in group 2.

Table 1: The Operative characteristics of Group 1 and Group 2

Variable	Group 2	Group 1	P-value
Defect size (cm ²)	69.81	45.41	0.446
Defects numbers	1.5	1.4	0.774
Ranges in cm ²	1-901	1-711	
Bowel	0	2	
None (NA)	11	9	
Omentum	21	26	
Bowel and Omentum	6	3	
Mesh size (cm ²)	8.5	9	0.176
Suction drainage requirement	1 (2 days)	21	
Complications (Intraoperative)	0	0	
Range	32-943	11-612	
Time of operation (min)	71.0	89.0	0.371
Suction drainage mean duration: days (range)		3.52 (1-16)	
Bleeding (ml)	24.0	131.0	0.001
Range	35-250	35-160	
Conversion	0	—	

Recurrent hernia: In both groups there was no recurrent hernia repair.

Location of the defect in the hernia: Among 60 patients in the laparoscopy group, there were 37 cases of PUH, 15 cases of

epigastric hernia, 8 cases of umbilical hernia, and among 60 cases of open abdominal hernia, including 31 cases of PUH, 19 cases of epigastric hernia and 10 cases of umbilical hernia.

Table 2: Comparison of PUH, Epigastric, and Umbilical Hernia in Group 1 and 2

Location	Group 1	Group 2
PUH	31	37
Epigastric hernia	19	15
Umbilical hernia	10	8

Hernias and surgical features: Table 1 shows the extent of the defect, the contents of the hernia, and the date of operation. The hernia sac's most prevalent content is Omentum. There were no intraoperative complications such as bowel or vascular injury requiring conversion to open technique. There were non-significant differences in the mean size of defect, size of mesh, or the operating time between the group one. Bleeding increased significantly in the Group 1 (0.001). However, no one need blood transfusions. In the first group, 36 patients had drainage tubes and closed suction put under their sub-cutaneous flaps. A drainage tube was also placed in the cavity of abdominal region of two patients in the Group 2 for blood drainage and irrigation fluids.

Postoperative Pain: There were non-significant variations in the level of pain or the need for treatment of pain between two groups in first 24 hours post-operation.

Postoperative complications: In the first group of patients, wound-related problems were the most common. In group 1, there were 16 cases of superficial wound infection with erythema and edoema that required empiric antibiotic therapy. Two patients in group 1 developed severe infections and required suture removal, daily dressings, and antibiotics. The infection resolves within 3 weeks. Two patients developed clear purulent abscesses and retinal infections, necessitating hospitalization and a month of daily dressings. The wound, however, healed without the removal of mesh. Two people had superficial necrosis at the flap's edges, which was treated with bandages on a daily basis. There were two symptomatic seromas in group 1, which required one-time aspiration. Six symptomatic seromas in the group 2, which required aspiration once for the four patients and twice for the other two patients.

Table 3: Comparison of complication between Group 1 and Group 2

Complication	Group 2	Group 1	P-value
Post-operative ileus	0	1	
Necrosis (Flap)	0	2	
Infection (Mesh)	0	2	
Seroma	6	2	
Wound infection (Superficial)	4 (10-mm port)	16	
Wound infection (Deep)	0	2	
Urinary retention	0	3	
Total	10	28	0.056
Number of stay (Hospital)			
Mean (Average)	1.61	4.03	0.007
Recurrence	0/60	0/60	0.954
%	6.25	3.33	
Range	1-2	1-41	

Hospitalization: The average duration of stay in Group 1 was 4.03 days (range: 1 to 41 days), whereas the average stay length in the Group 2 was 1.61 days (range, up to 2 days). Group 1 included a single patient who had serious wound infection and necrosis that required hospitalisation for 34 days, whereas group 2 had 1.47 days (range, 1-3 days). The difference between the two groups was statistically significant (p 0.007).

Recurrence: Check for signs of recurrence when the patient is lying down or standing. In the second group of patients, the hematoma and retinal protrusion were mixed and misinterpreted for about one second. However, in case of doubt, ultrasound or computed tomography (CT) scan is performed. There were no recurrence in both groups.

DISCUSSION

Surgeons and patients are gradually adopting laparoscopic incision and repair of primary abdominal hernias as a superior option. Laparoscopic repair is less painful, leads to better cosmetic outcomes, and is believed to lead to better outcomes in reducing hospitalizations and completely preventing wound recurrence and complications (17, 18). However, due to the lack of Level 1 evidence, randomized controlled trials should be conducted to evaluate the true benefit of incision and minimal access to primary abdominal hernia repair.

In all groups, lower abdominal gynecologic surgeries were the major source of incisional hernias, as compared to upper and central abdominal incisions following aortic, colonic, and gastric surgery in the West (19, 20). In this study, the total gender ratio was 2.3 to 1.

The operational time has been identified as one of the most important parameters in assessing the effectiveness of a surgical surgery. Laparoscopic ventral and incisional hernia repair is widely acknowledged to take longer (21, 22). In the current study, although the difference was non-statistically significant. Laparoscopic surgery required less time than open repair surgery. The surgical team's competence, a consistent method, and the use of tacks for mesh attachment made this achievable.

Despite the fact that no patients in the group 1 or 2 required any blood transfusions. Laparoscopic primary ventral and incisional hernia repair resulted in significantly less bleeding ($p = 0.001$) than open repair surgery.

Pain following hernia repair is a topic on which there is little research. In their study, DeMaria et al. found that laparoscopic repair resulted in less postoperative pain (23). Laparoscopic surgery is thought to have a lower risk of postoperative discomfort. During the early post-operative phase of this study, however, there was non-statistically significant difference in the analgesic or pain scores requirements between the two groups, despite the fact that analgesic requirements decreased quickly and the pain scores in the group 2 (laparoscopic) improved after 24 hours of surgery. The use of many tackers might explain why there was no change in the first 24 hours. Despite this, the majority of the patients in the Group 2 may be released from the hospital (First/second post-operative day). Most of the patients in the Group 2 felt more ease and tolerated oral intake early than those in Group 1. They were also the mobile and eager to get out of work early. Patients in the Group 1 stayed in hospital for substantially longer due to discomfort and the presence of drains fluids.

Wound-related problems have been a prominent drawback of traditional primary and incisional ventral hernia surgery. This is by far the strongest argument in favour of laparoscopic surgery. Wound hematoma, infection, dehiscence, necrosis, chronic sinus, seroma, and long-term chronic pain are all wound-related problems. Open mesh repair has a reported incidence of wound-related problems ranging from 3.5% to 18% (average, 8.1%) (24, 26), whereas laparoscopic mesh repair has a documented overall incidence of 2% (27-29).

In the current study, group 1 (open) had 38% wound-related problems, compared to 5.4% in group 2 (laparoscopic). There is a statistically significant difference. Despite the fact that the majority of wound infections in Group 1 were superficial, a course of antibiotics for a skin pathogen was necessary. One patient in Group 1 needed to be readmitted because of a substantial wound infection, necrosis, and dehiscence. Able to treat patient with dressings and debridement without the need for removal of mesh. No one in Group 2 experienced a major outcome that prompted rehospitalization.

Seroma formation is one of the most often reported postoperative complications following laparoscopic primary and incisional ventral hernia surgery. In several published series, the incidence of seroma ranges from 1% to 14%. (30,31). Seroma occurred in 13.3% of the subjects in our research. Seroma, on the other hand, did not contribute significantly to morbidity and, in most cases,

resolved without intervention. Some individuals required percutaneous needle aspiration once or twice. Seromas have been seen to proliferate after open surgery and are unaffected by vacuum drainage (32). In the current study, we think that maintaining a pack of gauze applying pressure dressing and over defect with adhesive tape for two weeks reduced seroma development.

Other faults are unlikely to be discovered during laparoscopic repair unless the problem is hidden behind the telescope. In our situation, it's possible that the fault isn't apparent through the telescope because it's coming from the left. We have created a routine that allows the telescope to provide a comprehensive view of the abdomen through multiple ports so as not to miss a clinically significant lateral defect. Serum is known to occur even after an open repair, and its prevalence is unaffected by the insertion of a drainage tube (33). It's also worth mentioning that when the incision heals, new regions of weakness will develop as further flaws, so it's essential to cover the whole incision, not just the defect itself (32). After covering the apparent defect, increased intra-abdominal pressure may attempt to force the abdominal contents through other weak places along the incision that are not covered by the mesh.

We altered the lower abdominal incisional hernia approach to reduce recurrence. When physically possible, reveal the cage straps and the anatomical structure of the pubic system before using the cage straps to secure the nets.

This is because, in general, there are fewer postoperative complications after laparoscopic surgery, and the cosmetic effect is improved. This has resulted in a greater adoption of laparoscopic surgery, which has advantages such as decrease post-operative morbidity and mortality, time of operation, bleeding, and the duration of hospital stay, as well as the ability to operate on obese and abdominal scarred patients. It's quickly becoming the gold standard for incision repair, primary abdominal hernia repair, and recurrent hernia repair. Laparoscopic incision and repair of an abdominal hernia, on the other hand, is considered advanced laparoscopic surgery and should only be attempted after thorough training and experience.

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