Early Experience of Laparoscopic Ventral Hernia Repair in Kenya

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Abstract

Background: Laparoscopic ventral hernia repair (LVHR) is gaining popularity amongst minimal access surgeons with numerous advantages over conventional open repair. We present the first local series of LVHR and analyse morbidity profile of the patients. **Methods**: Records of all patients who had LVHR were analysed in relation to hernia characteristics, operative, early and intermediate outcomes. **Results**: Twenty-seven patients (23 females, 4 males) had LVHR. Of these, four were primary hernias while rest were incisional. The age range was 16 to 76years. The mean size of the defect was 75 cm^2. A composite mesh was used in all the patients except one patient who had a pure prolene mesh. The mean operative time and hospital stay were 130 minutes and 3 days respectively. There were two conversions and no other major complication. With a follow-up period of 3-36 months, there was one recurrence at the fourth months. **Conclusion**: Our initial experience with this modality shows that LVHR is a feasible option with great potential in both treatment success and reduction of surgical morbidity.

Key Words: Laparoscopy, Laparoscopic ventral hernia repair, Ventral hernia

Introduction

Ventral hernias are fascial defects of the anterolateral abdominal wall through which intermittent or continuous protrusion of abdominal tissue or organs may occur. More than 80% of ventral hernias in adults are incisional hernias. They occur after 10-26% of abdominal procedures (1,2). Many repair methods have been described for these hernias. Traditional primary repair entails a laparotomy with suture approximation of strong fascial tissue on each side of the defect. However, recurrence rates after this procedure range from 41% to 52% during long-term follow-up (2–4). Herniorrhaphies in which large prosthetic meshes are implanted have lower failure rates (12–24%), but the required dissection of wide areas of soft tissue contributes to an increased incidence of wound infections and wound-related complications (12% or higher) (3,5,6). The interest in less morbid herniorrhaphies and the appeal of minimally invasive surgery encouraged development of laparoscopic methods for repairing ventral hernias. The technique is based on the same physical and surgical Pascal's principle as the open underlay procedure (7,8,9). Since the first report of laparoscopic ventral hernia repair (LVHR) in 1993(10), the operation has grown in popularity with the belief that it may offer shorter hospital stay, improved patient outcomes, and fewer complications than traditional open procedures. There have been several well-received series that have reported comparatively lower infection and recurrence rates in the laparoscopic approach to ventral hernia repair (4-6). We report our initial experience with laparoscopic ventral hernia repair and analyse the perioperative events and morbidity profile to improve future outcomes.

Methods

Twenty seven patients had LVHR completed between December 2008 and December 2013. Two patients had the attempted LVHR converted to open mesh repair. The patient's age, sex, hernia type and co-existing medical problems were recorded. The hernia defect size, prosthetic material used in the repair, method of fixation of the prosthesis, operative time, length of postoperative hospital stay, peri-operative and post-operative complications were recorded.

The same operative technique was used on all patients. Surgery was performed with patients in the supine position under general anaesthesia. Pre-

operative prophylactic antibiotics were given in all cases. All patients were catheterised to decompress the urinary bladder. Gastric decompression was achieved by placement of a naso-gastric tube. Access to the abdomen was accomplished at the Palmer's point by means a Verres needle. Pneumoperitoneum was induced to a preset pressure of 12 to 14 mm Hg depending on the size of the patient. Two additional ports (5 and 10mm) were made along the mid-axillary line, far away from the hernia. Adhesiolysis was done using non-energised sharp and blunt dissection with minimal use of diathermy to avoid inadvertent thermal injury to the bowel. The hernia contents were reduced but the peritoneal sac was left in-situ. The margins of the hernia defect were delineated and measured on the surface of the abdominal wall (Figure 1). The area of the hernia was approximated by taking its longest dimension as its diameter. A composite mesh (Proceed- Ethicon; or Omyra- Braun) was used in 26 patients while one patient had a pure polypylene mesh. The mesh was tailored externally on the abdominal wall to covers the hernial defect by a margin of at least 3 cm and introduced into the abdominal cavity via the 10mm port (Figure 2). After the mesh was positioned intra-peritoneally, it was spread to cover and overlap the margins of the defect.

The circumference of the mesh was then tacked onto the peritoneum and the posterior fascia at intervals of 1-2 cms. Transfascial sutures were added in ten patients only. There were no drains used. After exit of the pneumoperitoneum, the ports were closed with absorbable sutures and the wounds infiltrated with a long acting local anaesthetic agent.

Figure 1: Photograph showing the delineation of the hernia defect size and the 3cm overlap to be covered by the mesh on the surface of anterior abdominal wall

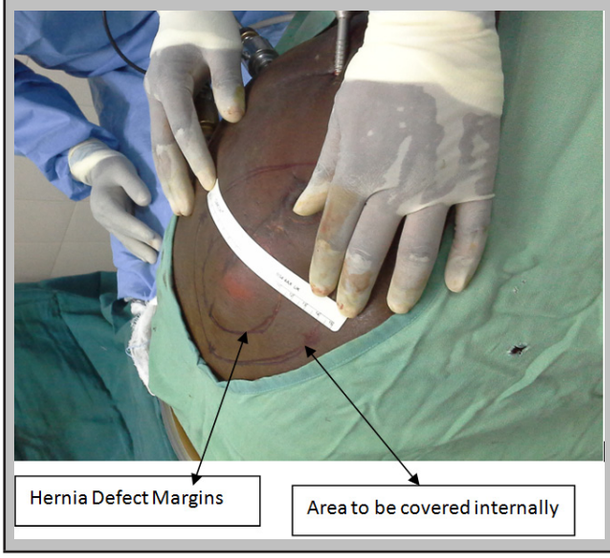
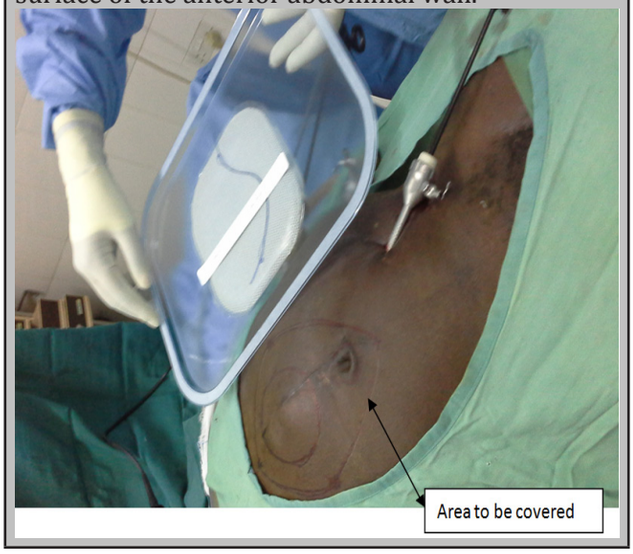


Figure 2: Photograph showing the dimensions of the mesh size and the area to be covered on the surface of the anterior abdominal wall.



Results

The patients and hernia characteristics, operative time, length of hospital stay, and cormorbities are shown in Table 1.

There were 23 females and 4 men, with a mean age of 43 (range16-76) years. The comorbidities encountered included hypertension, diabetes, HIV infection and cholelithiasis. There was no relationship between the onset of these comorbidities and the ventral hernia.

Of the hernia types, there were 23 incisional and 4 primary hernias (Table I). About 56% (n=15) of the patients had multiple (swiss-cheese) abdominal wall defect, and the rest had only a single defect. Twenty five had contents within the hernia sac with some being incarcerated, all of which were successfully reduced after establishment of pneumoperitoneum.

All the patients were operated on as elective cases, with successful completion of the procedure laparoscopically in 27 cases. There were two additional patients who were converted to open mesh repair, one due to very dense adhesions and the other due to mechanical failure of the fixing device.

No additional procedures were carried out during the herniorrhaphy. Intraoperative blood loss was negligible. The mean operative time was 130 minutes (range 55-240 minutes). The mean size of the mesh was 160 cm^2 (range 9-225 cm^2). The mean post-operative length of stay was 3.0 days (range 1-6 days). There were no major complications. Two patients had ileus for 3 days, two had seromas that lasted about four weeks and one patient had prolonged port site pain lasting for two weeks. The seromas were not aspirated and were allowed to

resolve spontaneously. There was no haematoma, wound infection or bowel perforation.

During a mean follow-up period of 19.3 months (range 1 to 36 months), there was a single recurrence at four months, giving a recurrence rate of 3.7%. This patient developed a recurrence acutely on exertion which was confirmed on ultrasound scan early in the series. During open mesh repair, the previously fixed mesh was found to have migrated from one edge confirming the recurrence to have resulted from a fixation technical error. She subsequently had the mesh refixed during an open surgery.

Discussion

An incisional hernia develops in 3% to 13% of patients following a laparotomy, and is the most common long-term complication following abdominal surgery. A lasting surgical correction of a ventral hernia thus remains a challenge (7-9).

Since the introduction of the laparoscopic mesh repair of ventral hernia practice by LeBlanc and Booth in 1993 many non-randomized and few randomized studies of laparoscopic mesh repair have been reported with a recurrence rates similar to those of open mesh repair and with an improvement in recovery time, hospital stay and complication rate (10-20). LVHR has also been established as a cost-effective procedure, with total facility costs for the laparoscopic repair being significantly lower than that for the open repair (15, 21).

Intra-abdominal placement of a large mesh with wide overlap of defects, use of smaller incisions, laparoscopic adhesiolysis to uncover small unpalpable defects that may go unnoticed with open repair, and use of stronger mesh fixation could account for the greater success of the laparoscopic operation (4, 5, 20). In our series, the patients as a group had favourable outcomes. Despite an early experience with this technique, there were only two conversions to open surgery. The mean operative time was about 130 minutes. This time is however longer than most mean operative times reported in other series, which range from 82 to 97 minutes (20-24). This is attributable to the early phase of the learning curve.

There were also no operative mortalities or major complications in our series. Seroma formation was the most common post-operative complication. It is considered significant if it lasts more than six weeks. We found that all of them resolved without treatment within six weeks. Heniford et al (6,25) recommended aspirating seromas in patients who are symptomatic, and allowing the others to resolve spontaneously.

We also observed that seroma at the site of hernia repair and suture site pain were the most common minor complications reported in other series as well(13-17). The suture site pain experienced may have originated from tissue or nerve entrapment during placement of sutures or tacks through the full thickness of the anterior abdominal wall. It could also have resulted from traction of the transabdominal sutures fixing the mesh to the anterior abdominal wall. Suture site pain is managed conservatively.

The major complications following LVHR are well documented. These include enterotomy, mesh infection, skin breakdown, intra-abdominal abscess and mortality. The overall complication rates range from 0% to 24%.(12,13,14). The recurrence rate in our series was3.7%, with a single recurrence at four months. Given that 66% to 90% of recurrences occur within two years (7,8,14) after operation, our mean follow-up of about 19.3 months is acceptable, and we do not expect the recurrence rate in this series to change markedly. Recurrence rates following laparoscopic repair in other series range from 0% to 11%(13,14).

All of the hernias in our series were repaired with a composite mesh, with only one repair utilising prolene mesh. Both polypropylene and polyester mesh have been observed to cause severe bowel adhesions, with subsequent intestinal erosion and fistulisation (4, 12,14-18). ePTFE also appears to be less easily infected than other biomaterials (22,23). It is therefore recommended that prolene component of the mesh materials be separated from the intestine, whenever possible (15, 20-23).

For this purpose, the composite meshes have been found to be well suited. The smooth side placed directly adjacent to the bowel has a pore size of 3μm, resulting in minimal tissue attachment; while the other side has an average size of 22μm, allowing tissue ingrowth and attachment to the anterior abdominal wall. There have been no reported cases in the literature of erosion or fistulation with the use of these meshes.

The final choice of mesh for laparoscopic hernia repair should be based on surgeon's preference and cost (16, 24-26). The initial concerns about intraperitoneal polypropylene mesh placement due to extensive adhesion formation seems to be subsiding, although debate persists (4,5,17,25-29). LVHR can essentially be extended to any patient who is a candidate for open repair and with an acceptable risk for general anaesthesia (16,19,23) As experience increases, LVHR can be safely extended to

patients with multiple prior abdominal procedures and atypically-located hernias. Incarceration is not a contraindication as onset of anaesthesia, muscle relaxation and introduction of pneumoperitoneum make reduction easy.

The data derived from our first 29 patients represents the first local series on laparoscopic ventral hernia repair in Kenya. In our series, we have found this procedure to be technically feasible, safe and effective, with good clinical outcome for our patients. The possible limitations in our series are the relatively small study group and the short mean follow-up period. This paper serves to share our experience and it is hoped that by doing so, there will be better awareness and acceptability of the procedure in this part of the world.

Conclusion

The initial results of this relatively new procedure in minimally invasive surgery are encouraging, but long-term results, especially in relation to recurrence and postoperative adhesions, need to be studied.

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