

“Outcomes of Laparoscopic ventral hernia repair as compared to Open repair, in a tertiary care government hospital in North India.”

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Abstract: Methods: We undertook a prospective non-randomised study of ventral hernia cases from 1st October 2010 to 30th September 2011, at Sawai Man Singh Hospital, a tertiary care government hospital in North India. A total of 30 cases were done, 15 by laparoscopic and 15 by open repair. Laparoscopic repair was done with polypropylene or composite mesh placed intraperitoneally. Open repair was done with polypropylene mesh placed in onlay fashion.

Results: Most common cause of ventral hernia was incisional hernia (67%), especially lower midline hernias. The average operating time was 64 mins in the laparoscopic group and 48 mins in the open group. In laparoscopic group, average cost of operative articles was Rs. 31750 when PROCEED mesh was used, Rs. 10365 when polypropylene mesh was used and in the open group, average cost of operative articles was Rs. 3095.

In the postoperative period, 10 patients (66.7%) of laparoscopic group and 3 patients (20%) of open group developed a seroma. None in the laparoscopic group and 6 (40%) in the open group developed wound infection. Mesh infection and subsequent mesh removal was done in 2 patients (13.3%) of open group. At the end of 6 months follow up, 3 out of the remaining 13 patients (23.1%) of open group and none of the laparoscopic group had developed a hernia recurrence.

Conclusion: Laparoscopic repair of ventral hernia is a safe and effective technique shorter hospital stay and no wound infections. The cost of operative articles is high and polypropylene mesh can be used to keep the cost in check. Seroma formation is common but it doesn't adversely affect outcomes. Our study found no recurrence of hernia at 6 months follow up in the laparoscopic group.

Keywords: ventral hernia, laparoscopic repair, government setup.

I. Introduction:

A hernia through a defect in the anterior abdominal wall is called ventral hernia, which may be midline (eg., epigastric, paraumbilical, incisional hernia through a midline laparotomy scar) or lateral (eg., parastomal, Spigelian, incisional hernia through non-midline surgical scars).

Traditionally, ventral hernias have been treated by mesh hernioplasty using the open technique. But over the last decade, laparoscopic mesh hernioplasty has emerged as an equally effective technique for ventral hernias, with a number of advantages like faster post operative recovery, less in-hospital stay etc.

The aim of our study was to analyse the various aspects and outcomes of laparoscopic ventral hernia repair and compare them with open mesh repair of ventral hernias.

II. Methodology:

We undertook a prospective non-randomised study of ventral hernia cases coming to a single surgical unit of Department of General Surgery, Sawai Man Singh Hospital, Jaipur from 1st October 2010 to 30th September 2011. Our hospital is a tertiary care government hospital with patients having to buy all the materials needed for an operation, while the hospital bed, nursing care and attending surgeon services in the operating room and post-operative ward are provided free of cost. Our study design was approved and cleared by the Institute Research Board and the Institute Ethics Committee.

All cases of ventral hernia coming to our unit during the study period were included. Cases of ventral hernia with active skin infection, skin ulceration or sinus formation were excluded. All patients were explained about open and laparoscopic techniques of mesh repair and the cost of materials needed in each case. The

patients then made an informed choice for either open or laparoscopic technique based on their preferences and affordability. Consent for participation in the study was obtained from each patient in their native language.

The laparoscopic ventral hernia repair was done using 10 mm 0 and 30 degree telescopes. Working ports were placed lateral to the hernia, to allow space for mesh fixation. Bipolar cautery or The Harmonic Ace (Ethicon Endosurgery, Johnson & Johnson) were the energy sources used for adhesiolysis and dissection of the sac. Either polypropylene (Prolene, Johnson & Johnson) or dual mesh (PROCEED, Johnson & Johnson) of appropriate size, giving atleast 3 cm overlap to the hernia defect, was used depending on the affordability of the patient. In all patients, the mesh was placed intraperitoneally. The mesh was fixed to the full thickness of the abdominal wall using transabdominal sutures of prolene 2-0, placed at fixed intervals along the margin of the defect. 5mm spiral tacks were placed all along the edges of the mesh, fixing the mesh to the peritoneum (Autotack, Covidien Inc). No drains were used.

The open mesh repair of ventral hernia was done as described below. Skin incision was placed along the long axis of the hernia, excising the previous scar tissue in cases of incisional hernias. The contents of the sac were freed of adhesions and reduced. A tissue plane was developed either anterior to the abdominal muscles to about 4 cms all around the defect. The polypropylene mesh was then placed correspondingly in an onlay fashion with atleast 3 cms overlap over the defect and fixed using prolene 2-0 sutures. Suction drains were used in all cases.

Postoperatively, in cases of open mesh repair, the drain was removed once the output in 24 hours was < 20ml. All patients were followed up till 6 months.

The data was computed in Microsoft Office Excel 2007. Data analysis and comparisons were done by Student's t test using the Statistical Package for Social Sciences (SPSS) Version 13 provided by the P&SM Department of our college.

III. Results:

A total of 30 cases of ventral hernia were included, 13 males and 17 females. 15 cases were operated by laparoscopic technique and 15 by open technique. 20 cases (67%) were incisional hernias, of which 17 were midline (12 were lower midline). The average defect size in the laparoscopic group (24.4 sq. cms) was larger than in the open group (10.5 sq. cms).

The average operating time was 64 mins in the laparoscopic group, whereas it was 48 mins in the open group. PROCEED mesh was used in 8 out of 15 cases in laparoscopic repair; in rest of the cases of laparoscopic group and in all cases of the open group, polypropylene mesh was used. In laparoscopic group, average cost of operative articles was Rs. 31750 when PROCEED mesh was used and Rs. 10365 when polypropylene mesh was used. In the open group, average cost of operative articles was Rs. 3095.

In the postoperative period, the most patients of laparoscopic group needed intravenous analgesics till day 1, whereas those of open group needed it till day 3. At 48hrs post op, 4 patients(26.2%) of laparoscopic and 5 patients(33.3%) of open group had paralytic ileus. Mean post-op hospital stay of patients was 2.1 days in the laparoscopic group and 3.4 days in the open group.

During follow up, 10 patients (66.7%) of laparoscopic group and 3 patients (20%) of open group developed a seroma. None in the laparoscopic group and 6 (40%) in the open group developed wound infection. Average duration of oral antibiotic intake was 5 days in laparoscopic group and 8 days in the open group. Mesh infection and subsequent mesh removal was done in 2 patients (13.3%) of open group. These 2 patients were subsequently excluded while following up for recurrence. At the end of 6 months follow up, 3 out of the remaining 13 patients (23.1%) of open group and none of the laparoscopic group had developed a hernia recurrence.

IV. Discussion:

The operating time was more in laparoscopic group. This may be due to the slow learning curve in laparoscopic ventral hernia repair. Other authors have also found that operating times varied between the 2 groups but were not significant[1,2]. Operative articles cost was much higher in laparoscopic group than in open group. This may be due larger meshes used for mean larger defects in laparoscopic group, cost of use of laparoscopic set and cost of mesh fixation devices in the laparoscopic repair. In our government setup where hospital bed, doctor and nursing services and drugs are provided free of cost, this cost difference becomes crucial in the decision-making of the patient while choosing the type of repair. Other studies too support the view that laparoscopic repair is costlier, but conclude that the difference is lesser when taking the total financial loss to the patient, including no. of days of hospital stay, no. of working days lost, cost of antibiotics and drugs etc.[3] Among the mesh used in laparoscopic repair, similar to others[4,5], we found no difference in outcomes, complications and recurrence with either simple polypropylene or composite PROCEED mesh. Hence, to bring down the cost in our setup, polypropylene mesh can be used in laparoscopic ventral hernia repair.

Among the early post operative outcomes, the laparoscopic group has lesser intravenous analgesic requirement and less hospital stay whereas paralytic ileus was similar to open group. This is similar to other authors who have concluded that laparoscopic repair is associated with less post-op pain[6] and shorter hospital stay[7,8]. Post-operative wound infection was much higher in the open group compared to laparoscopic group. Other authors have also drawn similar conclusions[7, 9]. Wound infection is a significant risk factor for subsequent mesh infection and hernia recurrence due to poor wound healing.

In late post-operative complications, two-thirds of patients in the laparoscopic group developed a seroma, making it the most common complication in the laparoscopic group. This is due to lack of drain placement and the hernia sac being left undisturbed in the laparoscopic group. Similar trend was observed by others [9 - 11]. However seroma formation did not adversely affect other outcomes like mesh infection or recurrence of hernia as both of these complications were not seen in the laparoscopic group.. Mesh infection and subsequent removal was done in 2 cases of open group; the 6 month recurrence rate was also high in the open group. This recurrence in the open group assumes more importance given the fact that the average hernia defect size was smaller in the open group. A similar observation has been made by others too[12 - 16]. However a longer follow up will guide us to a more accurate picture of recurrence rates.

V. Conclusion:

Laparoscopic repair of ventral hernia is a safe and effective technique with lesser post-operative pain, shorter hospital stay and no wound infections. The cost of operative articles is high and polypropylene mesh can be used to keep the cost in check. Seroma formation is very common but it doesn't adversely affect outcomes. Our study found no mesh infection and no recurrence of hernia at 6 months follow up in the laparoscopic group. Hence, laparoscopic repair should be preferred method of treatment of ventral hernias.

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