Original Article

Comparison of Open Mesh Hernioplasty Verses Laparoscopic Intraperitoneal Onlay Mesh for Ventral Hernias

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Objective: Compare the outcome of laparoscopic intraperitoneal onlay mesh (IPOM) with open mesh repair in ventral hernias.

Material and Methods: Seventy patients were divided into two groups of 35 each. Group A = IPOM repair and Group B = Mesh hernioplasty.

Results: The mean±SD age was in group A 44.54±7.06 years and 46.40±7.14 in group B. Twelve (34%) patients were male in group A, 14 (40%) patients were in group B and 23 (66%) patients were female in group A and 21 (60%) were female in group B with male to female ratio 1:1.91. There were only 3 (8%) patients had postoperative pain in group A and 10 (28%) patients were in group B ($p<0.05$) which is statistically significant. In comparison postoperative early surgical site infection in both groups, there was no patient on 3rd postoperative day in both groups. On 10th postoperative day 1 (3%) patient had surgical site infection in group A and 6 (17%) patients had postoperative early surgical site infection in group B ($p<0.05$) which is statistically significant.

Conclusion: Laparoscopic approach appears to be as effective, safe, feasible, and cosmetically good procedure. It has fewer rates of early surgical site infection and postoperative pain. Laparoscopic repair is good alternative to the open repair in the treatment of ventral hernias.

Keywords: Ventral hernia, laparoscopic intraperitoneal onlay mesh repair, mesh hernioplasty, postoperative pain, surgical site infection.

Introduction

A hernia is a protrusion of a tissue, structure, or part of an organ through the muscle tissue or the membrane by which it is normally contained.[1]

Approximately 100,000 ventral hernia operations are performed each year in United States.[2] When a ventral hernia occurs, it usually arises in the abdominal wall and also it can develop at umbilicus or any other area of the abdominal wall. Among the common ventral hernias are the incisional and para-umbilical hernias constituting about 85% of the overall ventral abdominal hernias. Such incisional hernias result after 2-20% of laparotomies for various diseases.[3] With better understanding of mechanics of ventral hernia, surgical sepsis and anesthesia, there are refinements in the techniques of ventral hernia repair. Mesh hernioplasty is the current gold standard for abdominal wall hernias but open repair of ventral hernias is associated with substantial complications and recurrences. Infection remains one of the most common complications of this technique.[4] One study shows wound infection rate of 14%[5] and postoperative pain of about 28%[6] using open mesh repair. Laparoscopic procedures are cosmetically good. Laparoscopic ventral herniorrhaphy (LVH) was first described in 1993.[7] The principle of laparoscopic incisional hernia repair is based on Rives Stoppa repair, first published in 1985.[8] Laparoscopic intraperitoneal onlay mesh (IPOM) is relatively a new technique in our setup although much work has been done in west. The intraperitoneal onlay mesh could be an interesting alternative as it is much easier to perform and faster to execute.[9] Laparoscopic technique to place an intraperitoneal mash to cover the hernia defect was first reported in 1993 by LEBLANC and BOOTH.[2]

One study shows wound infection rate of 0% and postoperative pain of about 8% using laparoscopic intraperitoneal onlay mesh technique.[10]

The rationale of this prospective randomized study is that laparoscopic intraperitoneal onlay mesh is relatively a new procedure performed in our setup although it is very commonly performed procedure in Western countries. Therefore, we want to aware our community that this procedure would be a better alternative to open mesh repair in terms of outcome in near future.

Material and Methods

A Prospective Randomized clinical trial was

Conducted at Department of Surgery, Services Hospital Lahore for duration of six months01-01-2011 to 30-06-2011. A total of 70 patients; 35 in each group, of ventral wall herniaswere included through Non probability purposive samplingwith 80% power of test, 8% margin of error i.e. in open mesh 14% and 0% in laparoscopic intraperitoneal onlay mesh (least among the two). Allmales and females above 18 years of age presenting with primary reducible ventral hernia (clinically diagnosed cases)with a defect size between 3 to 15 mm were included. Patients with irreducible, strangulated hernia (on history and examination), skin excoriation, loss of domain orco-morbid conditions were excluded from the sample size. Recruited through outdoor patient department, patients were evaluated by history and clinical examination. They were randomly allocated into two groups A and B by using random numbers table method after matching the confounding variables. After informed consent all patients were operated under general anesthesia.

For group A laparoscopic intraperitoneal onlay mesh repair was performed. A polypropylene mesh (Prolene-Ethicon®) was placed and fixed. For group B Mesh hernioplasty was performed.

All patients were monitored for presence or absence of postoperative pain at 6 weeks postoperatively and for early surgical site infection assessed on 3rd, 5th and 10th postoperative day.

No life threatening risk was involved per se in two procedures. However any untoward per-operative incident was dealt with on emergency basis and was appropriately recorded.Frequency and percentages were calculated for categorical variables. Mean and standard deviation were calculated for numerical variables. The significance of differences observed by the two methods being mainly qualitative (postoperative pain and early surgical site infection) was subjected to Chi Square test or Fisher's exact test. A p value of 0.05 or less was taken as significant.

Results

A total of 70 patients,35 in each group, at Department of General Surgery Services Hospital Lahore were studied over a period of 6 months from 01-01-2011 to 30-06-2011.

The age range was 32 to 65 years. In group 'A' 13 (37%) patients and in group 'B' 10 (28%) patients were between 32-41 years of age. In group 'A' 17 (49%) patients and in group 'B' 17 (49%) patients were between 42-51 years of age. Four (11%) patients in group 'A' and 7 (20%) patients in group 'B' were between 52-61 years of age. Only 1 (3%) patient in group 'A' and also 1 (3%) patient in group 'B' were >61 years of age. The Mean±SD age was 44.54±7.06 in group 'A' and 46.40±7.14 was in group 'B'.

Table-1: Comparison of open mesh hernioplasty verses laparoscopic intraperitoneal onlay mesh for ventral hernias.

Variables Age (years)	No of Patietns	Group A Percentage	No of Patietns	Group B Percentage	P value
32 - 41	13	37.0	10	28.0	
42 - 51	17	49.0	17	49.0	
2 - 61	4	11.0	7	20.0	
> 61	1	3.0	1	3.0	
Total	35	100.0	35	100.0	
Male	12	34.0	14	40.0	
Female	23	66.0	21	60.0	
Paraumbical hernia	12	49.0	18	52.0	
Umbical hernia	12	34.0	12	34.0	
Epigastric hernia	6	17.0	5	14.0	
Postoperative pain	3	8.0	10	28.0	<0.05
Early surgical site infection	1	3.0	6	17.0	
3rd postop day	-	-	-	-	
5th postop day	-	-	1	3.0	
10th postop day	1	3.0	6	17.0	<0.05

In this study 12 (34%) patients were male in group 'A' and 14 (40%) were male in group 'B'. Similarly 23 (66%) patients were female in group 'A' and 21 (60%) patients were female in group 'B'. Male to female ratio was 1:1.91 in group A and 1:1.50 in group 'B'.

Table-1 shows the diagnosis of patients in both groups. In group A 17 (49%) patients were paraumbilical hernia and 18 (52%) patients were in group B. Out of total 70, 12 (34%) were found umbilical hernia in group 'A' and also 12 (34%) patients were in group 'B'. Six (17%) patients were diagnosed of epigastric hernia in group 'A' and 5 (14%) patients were in group 'B'.

Table also shows the postoperative pain and early surgical site of infection. There were 3 (8%) patients suffered from postoperative pain in group 'A' and 10 (28%) patients in group 'B'. Only 1 (3%) patient was suffered in early surgical site infection in group 'A' and 6 (17%) patients were in group 'B'.

There were only 3 (8%) patients had postoperative pain in group 'A' and 10 (28%) patients were postoperative pain in group 'B'. A p value was <0.05 which is statistically significant.

There was no patient on 3rd postoperative day in both groups. On 5th postoperative day there was no patient in group 'A' and only 1 (3%) patient had postoperative early surgical site infection in group 'B'. On 10th postoperative day 1 (3%) patient had surgical site infection in group 'A' and 6 (17%) patients had postoperative early surgical site infection in group 'B'. A p value was <0.05 which is statistically significant.

Discussion

A study reported Mean patient age of 58.8 years in open group and 58.1 years in the laparoscopic group.[11] Another study done reported, wherein the mean±SD age was 57±13 years out of total 121 patients.[12] In a study the male to female ratio was 3:2.[13] A study reported different varieties of the ventral hernia and their mode of presentation are shown paraumbilical hernia remains the commonest type of ventral hernia in both the groups and sexes. In the present study there was paraumbilical hernia in 17 (49%) in group A and 18 (52%) patients had in group B which is comparable with other studies. In our study paraumbilical hernias was also the commonest type of ventral hernia in both groups.

Postoperative pain can lead to readmissions, hence increasing the morbidity and costs of laparoscopic procedure.A study done by Helgstrand, this complication of laparoscopic incisional hernia repair has been found.[14]

Suture site pain is the most common minor complications reported. 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.In the present study there was postoperative pain in 3 (8%) in group A and 10 (28%) in group B which is comparable with national and international studies.Some studies report that the wound infection is lower in laparoscopic hernia repair compared to open, as there is decreased extent of tissue dissection in the former. Seromas have also been associated with chronic postoperative pain. In laparoscopic hernia repair, the hernia sac is not excised.[15,16] This effectively leaves behind a potential space for seroma formation. It happens to be one of the complications inherent to this procedure.[17] Most seromas resolve with time, some requiring eight to 12 weeks for complete resolution. Majority of the authors considered the seromas for conservative management. In such cases ultrasound of abdomen can be an useful diagnostic tool.[18]The comparison of the results revealed that the major advantage of laparoscopy was the shortened postoperative hospital stay and the reduced incidence of mesh infection (P<0.05). On the other hand, operation time was significantly longer in the laparoscopy group (P<0.05). The major complications encountered in the laparoscopy group were ileus and a missed enterotomy. The most frequent minor complication was seroma, which was significantly more frequent in the laparoscopy group (P<0.05). Postoperative pain assessment revealed similar results in both groups.Laparoscopic repair of ventral hernias seems to be safe and effective.[19] Overall, fewer complications are reported after LVHR than after open mesh repair especially in relation to wound and mesh infection.

The laparoscopic repair of ventral hernia utilizes the principles of the open technique popularized by Stoppa, Rives et al, and Wantz. These principles include using large mesh prosthesis, adequate overlap of the hernia defect, and eliminating tension. In the laparoscopic technique, the mesh is placed intraperitoneally and extensive soft tissue dissection is eliminated. It has been shown, based on widely quoted comparative studies that with LVHR wound complication rate, patient discomfort, length of hospital stay, time to return to normal activities and

rence rates are all reduced. 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. In a study reported by there is a significant increase, given that the mortality rate of uncomplicated ventral hernia is only 0.05%. One of the most important aspects of ventral hernia repair is that the patients understand these implications preoperatively and have a clear understanding of the need to convert to an open procedure and the possibility that they still may have their hernia at the conclusion of the procedure.[20] In our study there was no mortality in group A and nor in group B which is comparable with international and national studies. A new technique for laparoscopic ventral hernia repair using 5-mm ports only and an alternative method for mesh insertion. This technique appears to be safe, can decrease incidence of postoperative port-site hernias, and is applicable to most patients undergoing laparoscopic ventral hernia repair. This technique should be evaluated in larger numbers of patients to assess its advantages and evaluate outcomes.[21]

Conclusion

The laparoscopic approach appears to be as effective, safe, feasible, cosmetically good, shorter operative time, faster recovery with low recurrence rates, low rates of wound and mesh infection, shorter hospital stay, low postoperative morbidity and good alternative to the open repairs in the treatment of primary ventral hernias. Advanced surgical skill, laparoscopic experience and high technology are mandatory factors for successful ventral hernia repair.

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