International Surgery Journal
Nandeesh M et al. Int Surg J. 2020 Jan;7(1):244-247
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20195978

Original Research Article

A comparative study of closure versus non-closure of hernial defect in laparoscopic ventral hernia mesh repair

Nandeesh M.*, Akash M. V.

Department of General surgery, Kanachur Institute of Medical sciences, Mangalore, Karnataka, India

Received: 18 December 2019
Revised: 22 December 2019
Accepted: 23 December 2019

***Correspondence:**
Dr. Nandeesh M,
E-mail: nandums2009@gmail.com

ABSTRACT

Background: Laparoscopic ventral hernia repair has better out comes when compared to open mesh repair. But closure of the hernial defect is still a contentious issue. This study is designed to compare the outcome of closure versus non-closure of hernia defect in laparoscopic ventral hernia repair.
Methods: A 2 years prospective randomized controlled study was conducted on 60 patients undergoing elective laparoscopic ventral hernia repair in the Department of General Surgery (November 2016 to October 2018).
Results: The patients in the two groups were analyzed using Chi-square, ANOVA, Fisher exact test, and results were formulated. The mean age of ventral hernia was 41 years and overall incidence more in females. Paraumbilical hernia is the commonest variety of ventral hernia and 63.3% hernias were reducible. Average post-operative length of hospital stay was 2 days with no difference in both the groups. Post-operative pain was more in intraperitoneal onlay mesh (IPOM) plus group. Seroma formation and Incidence of mesh bulge was found be more in IPOM group, but there was no difference in the incidence of chronic pain or recurrence rate between the two groups. All the above proved statistical significance.
Conclusions: Primary defect closure in ventral hernia along with mesh placement in laparoscopy seems to have better outcome, with respect to less chance of seroma formation and mesh bulge.

Keywords: Intraperitoneal onlay mesh plus, Intraperitoneal onlay mesh, Laparoscopic hernia defect closure versus non-closure, Laparoscopic ventral hernia repair

INTRODUCTION

Ventral hernias, whether naturally occurring or the result of previous surgery, comprise one of the most common problems confronting general surgeons, with overall incidence between 2 and 13%. The introduction of the anterior positioning of prosthesis has allowed to greatly reduce the recurrence. While laparoscopic ventral hernia repair (LVHR) has gained popularity in recent years, there is still significant controversy about the optimal approach to ventral hernia repair. Reasons to close the defect during LVHR prior to mesh insertion include the possibility of reduced seroma rate, reduced recurrence rate, improved abdominal wall function, and improved abdominal wall contour postoperatively.[1,2] Indeed, the International Endohernia Society guidelines for laparoscopic hernia repair recommend primary closure of the fascial defect with mesh underlay for defects of limited size. But none of these outcomes have been rigorously studied, and there is no general agreement on the definition of the term abdominal wall function.[3]

METHODS

A prospective observational study of 2 years from November 2016 to October 2018 was undertaken at Department of General Surgery, Dr B R Ambedkar Medical College, Bengaluru, for patients willing to

undergo laparoscopic ventral hernia repair. Sample size consists of 60 patients, which were randomly selected from elective surgeries which required ventral hernial defect size less than 10 cm. 30 cases each in two groups undergoing laparoscopic ventral hernia repair were selected by using random sampling technique.

Group A: Intraperitoneal onlay mesh (IPOM) group, Comprised of 30 patients without closure of hernia defect, but only on lay of intraperitoneal mesh through laparoscopy.

Group B: IPOM plus group comprised of 30 patients with closure of hernia defect and on lay of intraperitoneal mesh through laparoscopy.

Inclusion criteria

Patients of age >18yrs and with size of hernial defect <10 cm were included

Exclusion criteria

Patients with size of hernial defect >10 cm, patients not fit for general anesthesia and patients with recurrent ventral hernia after laparoscopic repair were excluded.

Data collection was done after clinical examination and obtaining consent from the patient for the study. Routine investigations like CBC with ESR, HIV, HBsAg, urine routine, RFT, blood glucose, ECG, USG abdomen and if required CT abdomen was carried out. Postoperatively patients were assessed and discharged. Post-operative pain was assessed using visual analog scale. Once the patients discharged, they were followed up till the end of study every 2 month by OPD visit.

Method of statistical analysis

Descriptive and inferential statistical analysis has been carried out in the present study. Results on continuous measurements are presented on mean±SD (min-max) and results on categorical measurements are presented in number (%). Significance is assessed at 5 % level of significance. The following assumptions on data was made. Assumptions: 1. Dependent variables should be normally distributed, 2. Samples drawn from the population should be random, cases of the samples should be independent. Analysis of variance (ANOVA) has been used to find the significance of study parameters between two or more groups of patients. Chi-square/ Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups, non-parametric setting for qualitative data analysis. Fisher exact test used when cell samples are very small.

P value significance: $^{+}$Suggestive significance (p value: 0.05<p<0.10), *moderately significant (p value: p<0.01), **strongly significant (p value: p<0.01). The statistical software namely SPSS 18.0, and R environment ver.3.2.2 were used for the analysis of the data and Microsoft word and excel have been used to generate graphs, tables etc. The investigator was a part of the surgical team managing the patients. Purposive sampling methods were used and the two groups were compared in terms of various parameters.

RESULTS

Out of the total 60 patients the mean age was 41 with Standard deviation of 9.25. 40% of study population falls under 31-40 years. Table 1 shows the mean age in the IPOM group was 43.07 years±8.27, and the mean age of IPOM plus group was 38.9 years±9.82.

Table 1: Age distribution.

Age in years	IPOM N (%)	IPOM plus N (%)	Total N (%)
21-30	1 (3.3)	7 (23.3)	8 (13.3)
31-40	12 (40)	12 (40)	24 (40)
41-50	12 (40)	7 (23.3)	19 (31.7)
51-60	5 (16.7)	4 (13.3)	9 (15)
Total	30 (100)	30 (100)	60 (100)
Mean±SD	43.07±8.27	38.9±9.82	41±9.25

Females were more in number in both the groups when compared to males. Hence it was not statistically significant as they were equally distributed in both the groups.

In the total of 60 patients studied, the following three types of hernia was seen (paraumbilical hernia, incisional hernia and recurrent hernia). Figure 1 represents that paraumbilical hernia is the commonest type in IPOM and IPOM plus group accounting for 22 patients in IPOM group and 19 patients in IPOM plus group.

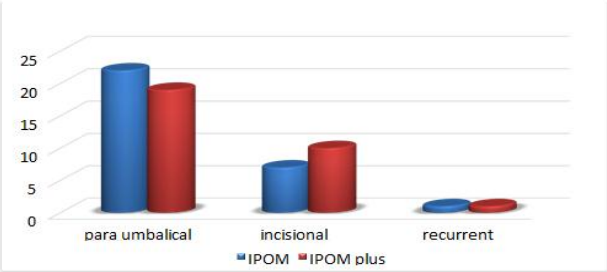

Figure 1: Types of hernia.

The average defect size in the study population was 3.27±1.45 cm. Whereas the average defect size in IPOM group was 3±1.26 cm and the average defect size in IPOM plus group was 3.53±1.59 cm. Table 2 represents the defect size in the study population and also the distribution of the same among the IPOM and IPOM plus groups.

Table 2: Defect size among the two-study population.

Defect size (in cm)	IPOM N (%)	IPOM plus N (%)	Total N (%)
<4	22 (73.3)	17 (56.6)	39 (65)
4-6	7 (23.3%)	11 (36.6)	18 (30)
>6	1 (3.3%)	2 (6.6)	3 (5)
Mean±SD	3±1.26	3.53±1.59	3.27±1.45

P=0.927, not significant, Student t test.

Post-operative complications

In the present study post-operative complications were divided into early postoperative complications and delayed post-operative complications. Early postoperative complications included wound infection and seroma. Delayed postoperative complications included chronic pain, mesh bulge and recurrence. The Table 3 shows both early and delayed post-operative complications in the two-study group.

Table 3: Post-operative complications in two study groups.

Post-operative complications	IPOM N (%)	IPOM plus N (%)
Wound infection	1 (3.33)	1 (3.33)
Seroma	6 (20)	2 (6.67)
Chronic pain	1 (3.33)	2 (6.67)
Mesh bulge	2 (6.67)	0 (0)
Recurrence	0 (0)	1 (3.33)

Table 4: Post-operative VAS scores among the two groups.

Post-operative VAS scores	IPOM	IPOM plus	Total
1	4	1	5
2	8	7	15
3	8	11	19
4	6	6	12
5	2	5	7
6	2	0	2
Mean	3	3.23	3.12

P=0.006**, significant, ANOVA test.

Table 5: Distribution of comorbid conditions among the study population.

Comorbid conditions	IPOM N (%)	IPOM plus N (%)	Total N (%)
DM	8 (26.7)	9 (30)	17 (28.3)
HTN	10 (33.3)	8 (26.7)	18 (30)
Hypothyroid	2 (6.6)	3 (10)	5 (8.3)

P=1.000, not significant, Fisher exact test, DM: Diabetes mellitus, HTN: hypertension.

DISCUSSION

The present study compared the primary closure verses non-closure of hernial defect in laparoscopic ventral hernia repair. The aim was to compare the postoperative out comes and the long-term complications of the above two procedures.

In the present study 40% of the population falls under 31-40 years. The mean age was 41 years in the study population. The mean age of patient in the IPOM group was 43.07 years, and the mean age of IPOM plus group was 38.9 years. This study shows that, ventral hernia is a condition mostly seen in middle aged people. But it can occur in any age groups. Present study shows that females were more in number in both the groups when compared to males. And hence the overall incidence is more common in females stating that female gender is more prone for ventral hernia than male. Other studies like Zeichen et al, also mention about the gender predisposition.[4]

In the total of 60 patients studied, paraumbilical hernia was found in 68.3%, followed by incisional hernia in 28.3% and recurrent hernia. This shows that paraumbilical hernia is the most common variety of ventral hernias. Other studies by Suwa et al, Clapp et al, and many others shows that para umbilical hernia was found in around 60% of patients and it's the most common variety as stated before.[5]

In this study, patients were chosen with defect size less than 10 cm. Majority of the patients had defect less than 4 cm in both IPOM and IPOM plus group. The average defect size in the study population was 3.27 cm. And this is comparable with studies by Franklin et al, with the average defect size in their study being 3 to 5 cm.[6]

In the present study among DM, HTN and hypothyroidism, HTN was the commonest comorbid condition followed by DM and hypothyroidism. These were seen in both IPOM and IPOM plus study groups and were not statistically significant in their distribution among the study population. Hence these were not altering the post-operative outcome in the present study.

Post-operative length of hospital stay was compared in both the procedures and found that post-operative hospital stay was not associated on type of procedure. More than 60% of the patients in both the group got discharged on postoperative day 1 or 2. This shows the major advantage of laparoscopic procedure. The average hospital stay in IPOM group was 2.33 days and in IPOM plus was 2.37 days. This can be compared to study by Sharma et al, in which their average length of hospital stay was 2 days.[7] Post-operative pain assessed using visual analogue score, at 24 hours post operatively showed that post-operative pain was more in IPOM plus group. This could be because of the suture which is used to close the defect in IPOM plus group. But none of the

other studies have compared the post-operative pain between the two procedures.

Post-operative complications were divided into early and delayed post-operative complications. Early post-operative complications included wound infection and seroma. Delayed post-operative complications included chronic pain, mesh bulge and recurrence. In early post-operative complications, wound infection was observed in 3.33% of patients in both group which was not statistically significant. Significant seroma formation was seen in 20% of IPOM population when compared to IPOM plus population which had only 6.67%. This result was comparable to results of Clapp et al, which showed that IPOM has more incidence of seroma.1 In delayed post-operative complications, incidence of mesh bulge was found be more in IPOM group i.e., 6.67% compared to IPOM plus group where none of the patient had mesh bulge. This suggests that the incidence of mesh bulge can be reduced by closing the hernia defect along with mesh placement. The same result was also seen by studies conducted by Clapp et al.[1] There was no difference in the incidence of chronic pain between the two groups and this was comparable to study conducted by Clapp et al.[1] In the present study there was no statistically significance in recurrence rate between IPOM and IPOM plus group and the same was observed in other studies like Strey et al, Gonzales et al.[8,9] However, few other studies by Clapp et al, state that recurrence rate is less in IPOM plus group.[1]

CONCLUSION

The present prospective comparative study between primary closure versus non closure of ventral hernia defect in laparoscopy seems to have better outcome in a defect closure group with respect to less chance of seroma formation and mesh bulge. But this doesn't seem to reduce the chance of recurrence. However, post operatively patient may require analgesics for longer time, in defect closure group, as pain will be more in them. But this will not increase the length of hospital stay or increase the incidence of chronic pain in them.

ACKNOWLEDGEMENTS

Sincere thanks to the staff, technicians and other departments like Anesthesia, Obstetrics, and General Medicine for their support in conducting the study. Thankful for the patients who participated in the study

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Clapp ML, Hicks SC, Awad SS, Liang MK. Trans-cutaneous closure of central defects (TCCD) in laparoscopic ventral hernia repairs (LVHR). World J Surg. 2013;37(1):42-51.
2. Rea R, Falco P, Izzo D, Leongito M, Amato B. Laparocopic ventral hernia repair with primary transparietal closure of the hernial defect. BMC surg. 2012;12(1):S33.
3. Bittner R, Montgomery MA, Arregui E, Bansal V, Bingener J, Bisgaard T, et al. Update of guidelines on laparoscopic (TAPP) and endoscopic (TEP) treatment of inguinal hernia (International Endohernia Society). Surg Endoscopy. 2015;29(2):289-321.
4. Zeichen MS, Lujan HJ, Mata WN, Maciel VH, Lee D, Jorge I, et al. Closure versus non-closure of hernia defect during laparoscopic ventral hernia repair with mesh. Hernia. 2013;17(5):589-96.
5. Suwa K, Okamoto T, Yanaga K. Closure versus non-closure of fascial defects in laparoscopic ventral and incisional hernia repairs: a review of the literature. Surg today. 2016;46(7):764-73.
6. Franklin ME, Dorman JP, Glass JL, Balli JE, Gonzalez JJ. Laparoscopic ventral and incisional hernia repair. Surg laparoscopy endoscopy. 1998;8(4):294-9.
7. Sharma A, Mehrotra M, Khullar R, Soni V, Baijal M, Chowbey PK. Laparoscopic ventral/incisional hernia repair: a single centre experience of 1,242 patients over a period of 13 years. Hernia. 2011;15(2):131-9.
8. Strey CW. Triple-step laparoscopic incisional hernia repair: midline suture closure supported by dorsal component separation and intraperitoneal onlay mesh reinforcement. World J Surg. 2014;38(12):3276-9.
9. Gonzalez AM, Romero RJ, Seetharamaiah R, Gallas M, Lamoureux J, Rabaza JR. Laparoscopic ventral hernia repair with primary closure versus no primary closure of the defect: potential benefits of the robotic technology. The Intern J Med Robotics and Computer Assisted Surg. 2015;11(2):120-5.

Cite this article as: Nandeesh M, Akash MV. A comparative study of closure versus non-closure of hernial defect in laparoscopic ventral hernia mesh repair. Int Surg J 2020;7:244-7.