



INCISIONAL HERNIA SURGERY; COMPARING THE FUNCTIONAL OUTCOME OF PREPERITONEAL MESH REPAIR VERSUS ONLAY MESH REPAIR AND LAPAROSCOPIC IPOM IN INCISIONAL HERNIA SURGERY

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ABSTRACT... Objectives: To evaluate the postoperative complication of different incisional hernia repair techniques; preperitoneal repair, onlay repair, and laparoscopic IPOM. **Study Design:** Randomized control trial. **Setting:** Multan Medical and Dental College Multan. **Period:** One year duration from June 2016 to June 2017. **Methodology:** Collected data was analyzed by using SPSS statistical software), mean and standard deviation was calculated for continuous data and frequencies with percentages (%) were calculated and presented for qualitative data. P value ≤ 0.05 was considered as significant. **Results:** Total 90 patients enrolled in this study, both genders. There were 65.6% (n=59) men and 34.4% (n=31) women. Patients who were treated with preperitoneal repair were able to perform forceful activities in earlier time when compared to those who were treated with onlay repair at 11th weeks. The differences were statistically significant. **Conclusion:** The observations of our study revealed that Laproscopic IPOM was found to be effective and easy for patient compliance and level of satisfaction in terms of CCS scoring system with regard to occurrence of complications, appearance of the abdominal wall without laxity in a single sitting and to resume daily activities.

Key words: Incisional Hernia, Laparoscopic IPOM, Onlay Mesh Repair, Preperitoneal Mesh Repair.

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INTRODUCTION

Incisional Hernia is a common complication after major surgeries, about 20% cases of laparotomy goes into Incisional Hernia.¹ As time passes with this type of hernia becomes severe and its repair becomes difficult.² Some more worse condition of Incisional Hernia are bowel obstruction and enterocutaneous fistula. To avoid such type of complications elective repair is recommended.³ About 58% recurrence rate was reported in previous literature. It was also reported that recurrence rate is very low when prosthetic mesh repair was done and considered as a gold standard treatment.⁴

Wound infection is another problem of mesh repair. In both type of surgical repairs ventral hernia and incisional Hernia type and method of repair is very important especially when prosthetic mesh repair planned.⁵ Reconstruction of abdominal wall with mesh repair is more effective and less recurrence

rate when compared with primary repair. Many repair techniques are used like syblay repair⁶, Onlay repair and laparoscopic intraperitoneal onlay repair (IPOM). Among these techniques no one was proved to be superior and more effective than other technique.⁷

Every type of repair have its own complications and benefits, as in onlay repair skin flaps opening have greater risk of infections but its is easy to proceed.^{8,9} Intraperitoneal mesh repair have risk of bowel obstruction but its efficacy is better than other two techniques. Laparoscopic IPOM also have better outcomes but injury to internal organ is common in this aspect.^{10,11}

METHODOLOGY

This prospective randomized double blind study was carried out after permission from department and hospital ethical committee. After complete Information consent was signed by the patient

and taken as record. Study was completed in year duration from June 2016 to June 2017 under supervision of senior staff of surgical department. Patient who were selected for Incisional Hernia mesh repair with age more than or equal to 18 years and Incision more than or equal to 4 cm were selected for study. Non probability consecutive sampling was used. Patients with already mesh repair at the same site, infected site, any additional surgical work at that site, contaminated wound were excluded from the study. Total number of patients was divided into three groups; onlay repair in one group, preperitoneal repair in second group and laparoscopic in third group. Complete data of preoperative, post operative and follow up was noted.

Complications of the study were any adverse events with abdominal wall or organs of surgery, complications may be mild, moderate or severe. Mild were those which resolved without treatment and does not interfere persons activity, moderate were interfering with activity and severe were those which are uncomfortable for person and resolved with additional surgery. Perioperative events include which were occurred within 14 days, intra operative were blood loss and duration of surgery. Early postoperative were those within 6 months and late were occurred after 6 months of procedure.

Follow ups were done at two weeks, two months, six months and after 6 months when patient feel to follow. On every follow up complete history and examination was done, patients quality of life was also assessed with Carolinas comfort scale (CCS) which consist of 23 scores of different activities; bending over, lying down, activity of daily routine, sitting, walking, coughing deep breathing, use of stairs and exercise. Best score is 0 and worse is 115 of this scoring system. In onlay repair procedure was started with vertical median incision to identify the hernia sac, after skin flap exposure midline rectus was closed. With overlap of five cm abdominal wall at the anterior site of rectus defect a mesh was placed. In preperitoneal repair between both posterior rectus sheets and peritoneam space was created, mesh was placed in in this space and rectus was closed with non

absorbable suture. Suctions drains were also placed to remove fluid accumulation. While in laparoscopic IPOM after small incision at non scar portion of skin was made through which instruments and camera was inserted to visualize hernia sac contents. Mesh was fitted and exposed contents and fascia was closed with all aseptic measures. A 15 into 15 meshes was used in both initial repairs and laparoscopic repair was done with composite mesh.

Collected data was analyzed by using SPSS statistical software), mean and standard deviation was calculated for continuous data like CCS score and frequencies with percentages (%) were calculated and presented for qualitative data like days of return to activity, wound infection, drain return time, mesh rejection, mesh migration. P value ≤ 0.05 was considered as significant.

RESULTS

Overall, 100% (n=90) patients enrolled in this study, both genders. There were 65.6% (n=59) men and 34.4% (n=31) women. The mean age of the patients was 50.08 ± 2.89 years. The patients divided into three equal groups i.e. thirty patients underwent onlay mesh repair, thirty underwent preperitoneal repair and thirty underwent laparoscopic IPOM.

In the perioperative period, seroma collection occurred in 12 patients, wound infection occurred in 5 patients, peritonitis occurred in 2 patients of undergoing onlay repair. Seroma collection occurred in 6 patients, wound infection occurred in 7 patients of the preperitoneal repair group. Wound infection was found in only 9 patients of laparoscopic mesh repair. In the onlay group, longest number of days of retained drain was observed. The differences were statistically significant. (Table-I).

In early postoperative (15 days–6 months), seroma occurred in 4 patients, sinus formation occurred in 17 patients, mesh rejection occurred in 6 patients while recurrence of hernia observed in 3 patients of the onlay repair group. Sinus formation occurred in 12 patients of preperitoneal repair. While in only one patient, seroma and

recurrence of hernia was observed of laparoscopic patients. In late postoperative (>6 months), sinus formation, mesh rejection, mesh migration, recurrence of hernia and enterocutaneous fistula occurred in 8, 2, 4, 3 and 1 patients respectively, for onlay repair group. Sinus formation and mesh rejection occurred in 1 and 2 patients respectively, for preperitoneal repair group. While only in one patient mesh rejection occurred for laparoscopic group. The differences were statistically significant. (Table-I).

The mean carolinas comfort scale (CCF) 2nd week, 2nd month and 6th month for the time of postoperative follow-up was 42.13±2.01, 37±2.62 and 21.73±2.28 respectively, for onlay repair group. For preperitoneal repair group, it was 49±3.66, 30.20±2.45 and 14.30±2.62

respectively. While, for the laparoscopic group, the mean carolinas comfort scale (CCF) 2nd week, 2nd month and 6th month for the time of postoperative follow-up was 34.43±2.37, 34.20±2.07 and 31.23±3.22. The differences were statistically significant. (Table-II).

2 weeks is a standard time, major number of patients returned to their normal activities in this time from almost all repairing techniques. All patients returned to their activities after 4th week of surgery. Patients who were treated with preperitoneal repair were able to perform forceful activities in earlier time when compared to those who were treated with onlay repair at 11th weeks. The difference was statistically significant p=0.000 (Table-III).

	Onlay Repair (n=30)	Preperitoneal Repair (n=30)	Laparoscopic (n=30)	P-Value
Perioperative (<14 days)				
Days of retained drain	11	5	0	0.000
Seroma	12	6	0	
Wound infection	5	7	9	
Peritonitis	2	0	3	
Early Postoperative (15 days–6 months)				
Seroma	4	0	1	0.000
Formation of sinus	17	12	0	
Rejection of mesh	6	0	0	
Recurrence of hernia	3	0	1	
Late Postoperative (>6 months)				
Sinus formation	8	1	0	0.000
Mesh rejection	2	2	1	
Mesh migration	4	0	0	
Recurrence of hernia	3	0	0	
Enterocutaneous fistula	1	0	0	

Table-I. Adverse events in the study groups

	Time of Postoperative Follow-up	Onlay Repair (n=30)	Preperitoneal Repair (n=30)	Laparoscopic (n=30)	Test of Sig.
Carolinas Comfort Scale (CCF) mean	2nd week	42.13±2.01	49±3.66	34.43±2.37	F=206.61,p=0.000
	2nd month	37±2.62	30.20±2.45	34.20±2.07	F=61.01,p=0.000
	6th month	21.73±2.28	14.30±2.62	31.23±3.22	F=289.47,p=0.000

Table-II. Carolinas comfort scale (CCF)mean values of score in the study groups

Duration to Return to Activity	Onlay Repair (n=30)	Preperitoneal Repair (n=30)	Laparoscopic (n=30)	P-Value
Duration to Return to Normal, Daily Activity				
<2 weeks	16	22	13	0.000
2-4 weeks	14	8	4	
4-8 weeks	0	0	0	
Duration to Return to More Strenuous or Vigorous Activity				
<3 weeks	6	9	2	0.000
3-7 weeks	8	9	3	
7-11 weeks	7	4	4	
>11 weeks	1	2	2	
Not applicable	8	6	2	
Patient's physical job requirements				
Minimal physical requirements	7	10	16	0.000
Moderate physical requirements	10	12	7	
Heavy physical requirements	6	5	4	
Not employed	7	3	3	

Table.-III. Duration to return to various activities in the study group

DISCUSSION

Numerous studies are available in which two techniques were compared to in terms of CCS method but double blinded studies are not too much in numbers. Results of our study reveal that, patients undergoing any repair technique returned to normal daily routine activity within 2 weeks. All patients returned to their activities after 4th week of surgery. Patients who were treated with preperitoneal repair were able to perform forceful activities in earlier time when compared to those who were treated with onlay repair at 11th weeks. The difference was statistically significant p=0.000. The differences were statistically significant. We used mesh repair instead of suture repair in our study because mesh repair recommended in many reports to be superior than suture.

In a study conducted by de Vries Reilingh TS et al¹² reported that mesh repair is standard method for surgeries of incisional hernia instead of suture. Kurzer M et al and¹³ Mathes T et al¹⁴ also reported similar findings in their studies. These are studies were conducted on similar concept of mesh repair as we adopted.

Natarajan S et al¹⁵ conducted a study in 2016 on this topic and reported that preperitoneal repair found to be superior as compared to other two

techniques onlay mesh and laparoscopic IPOM. Patient's compliance and satisfaction is much better in this technique, it is also easy to perform by surgeons and learning time period is also short in this technique. Results of this study were identical to our results and comparable with our findings.

In a study Zhang Y et al¹⁶ compared laparoscopic technique with open hernia and reported that laparoscopic technique is much better than open technique of incisional hernia repair. Julie L et al¹⁷ also conducted a study mesh location and better effective method of incisional hernia repair and reported that sublay technique have better outcomes as compared to onlay and inlay repair of incisional hernia repair.

Another study was conducted by Afifi RY et al¹⁸ and reported that intraperitoneal mesh repair is better than onlay mesh repair when compared in terms of recurrence rate, infection and CCS scale. This study is also comparable with our study.

CONCLUSION

The observations of our study revealed that Laproscopic IPOM was found to be effective and easy for patient compliance and level of satisfaction in terms of CCS scoring system with regard to occurrence of complications,



appearance of the abdominal wall without laxity in a single sitting and to resume daily activities.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Ammara Liaquat	Conceived idea, Study design.	
2	Rizwan Ahmad	Data collection, Literature review.	
3	Amna Liaquat	Manuscript writing, Data analysis	