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Original Research Article

Onlay and Sublay Mesh Repair in Incisional Hernias: Randomized Comparative Study

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Abstract

Aim: The study of Onlay and Sublay mesh repair in incisional hernias.

Methods: This was a randomized comparative study conducted in the Department of Surgery, Madhubani Medical College and Hospital, Madhubani, Bihar, India, for 12 months. Clinically diagnosed as incisional hernia were included in this study. Total 100 cases were studied during the above said scheduled period. The patients were randomly divided into two groups. Group A (Onlay mesh) and Group B (sublay mesh) repair carried out.

Results: Out of 100 subjects from onlay group, majority were from 31-40 years age group. i.e., 21 (42%) whereas in sublay group 27 i.e., 54% were from 31-40 years age group. In both group majority were from same age group. Proportion of males were 64% and 58% in onlay and sublay group respectively. Proportion of females were 36% and 42% in onlay and sublay group respectively. Postoperative complication like seroma was seen in 14% and 10% respectively from onlay and sublay group. This proportion of seroma was more in onlay group as compared to sublay group (<0.05). Postoperative complication like deep SSI was seen in 10% and 6% respectively from onlay and sublay group. This proportion of deep SSI was almost equal in both the groups (p>0.05). Postoperative recurrence of hernia was seen in both groups equally i.e., 3 case in each group (p>0.05). Mean days of hospitalization in onlay group was 8.52±1.8 days whereas in sublay group it was 0.071±1.35 days. Difference in mean days of hospitalization between both groups was found to be highly significant (p<0.001). It means number of days of hospitalization in sublay group was less as compared to onlay group.

Conclusion: Sublay mesh repair has a lower rate of post-operative complications than onlay mesh repair, although larger studies are required to choose the better of the two procedures.

Keywords: mesh repair, onlay, incisional hernias

Introduction

Ventral hernias are commonly encountered in surgical practice.[1] The estimated incidence of ventral hernias is 15-20%[2] Despite the frequency of surgical repair, “Perfect results” continue to elude surgeons and the rate of surgical failure is humbling (10-30%)[3] True recurrence rates are probably underestimated[4]

For the foreseeable future, hernia surgery is a procedure likely to be delegated to junior staff and trainee surgeons.[5] Recurrence, the ultimate nightmare of a hernia surgeon,

adds significantly to health care costs, and poses a further economic burden.[6]

Confronted with the fact that onset of a ventral hernia is due to a biological problem of stable scar tissue formation, the mesh techniques today are the methods of choice for hernia repair.[7]

To avoid recurrences, a variety of materials were tried to reinforce the repair via fascial autografts, prosthetic materials, meshes of various types. The techniques of placements include onlay, sublay, sandwich technique, etc. But the best position for inserting the mesh has not been conclusively established till date as per literature.

Material and methods

This was a randomized comparative study conducted in the department of Surgery, Madhubani Medical College and Hospital, Madhubani, Bihar, India, for 12 months after taking the approval of the protocol review committee and institutional ethics committee.

Inclusion criteria

Inclusion criteria included who had age between 18-70 years, clinically diagnosed as incisional hernia and those willing to participate in study after informed consent.

Exclusion criteria

Exclusion criteria excluded from the study were-all patients below the age of 18 years, laparoscopic mesh repair, transverse incisional hernias and those not willing to participate in the study

Methodology

Total 100 cases were studied during the above said scheduled period. The patients were randomly divided into two groups. Group A (Onlay mesh) and Group B (sublay mesh) repair carried out.

A proforma for study of all consecutive patients of incisional hernia will be used. The presentation, clinical findings and the management will be documented. The patient related factors of sex, age, presence and absence of obesity, cough, constipation, prostatism, diabetes, mellitus, glucocorticoid therapy, smoking status and abdominal surgical history will be recorded. Factors related to the operation including the surgical technique and the presence or absence of haematoma dehiscence and infection will be analysed. Hb%, BT, CT, DC, blood urea, serum creatinine, RBS/PPBS, FBS, ECG in all leads, chest screening, urine (albumin, sugar, microscopy) was carried out preoperatively.

Statistical analysis

Data was collected by using a structure proforma. Data entered in MS excel sheet and analysed by using SPSS 25.0 version IBM USA. Qualitative data was expressed in terms of proportions. Quantitative data was expressed in terms of mean and SD.

Results

Out of 100 subjects from onlay group, majority were from 31-40 years age group. i.e., 21 (42%) whereas in sublay group 27 i.e., 54% were from 31-40 years age group. In both group majority were from same age group (Table 1).

Proportion of males were 64% and 58% in onlay and sublay group respectively. Proportion of females were 36% and 42% in onlay and sublay group respectively (Table 2).

Postoperative complication like seroma was seen in 14% and 10% respectively from onlay and sublay group. This proportion of seroma was more in onlay group as compared to sublay group (<0.05) (Table 3).

Postoperative complication like deep SSI was seen in 10% and 6% respectively from onlay and sublay group. This proportion of deep SSI was almost equal in both the groups (p>0.05) (Table 4).

Postoperative recurrence of hernia was seen in both groups equally i.e., 3 case in each group (p>0.05) (Table 5).

Mean days of hospitalization in onlay group was 8.52±1.8 days whereas in sublay group it was 0.071±1.35 days. Difference in mean days of hospitalization between both groups was found to be highly significant ($p<0.001$). It means number of days of hospitalization in sublay group was less as compared to onlay group (Table 6).

Table 1: Distribution according to age in both groups

Age (years)	Onlay		Sublay		Total
	Frequency	Percent (%)	Frequency	Percent (%)	
31-40	21	42	27	54	48
41-50	13	26	13	26	26
51-60	9	18	7	14	16
61-70	7	14	3	6	10
Total	50	100	50	100	100

Table 2: Distribution according to gender in both groups

Gender	Onlay		Sublay		Total
	Frequency	Percentage	Frequency	Percentage	
Male	32	64	29	58	61
Female	18	36	21	42	39
Total	50	100.0	50	100.0	100

Table 3: Association of postoperative seroma with respect to procedure

Seroma	Onlay		Sublay			Chi square test	P
	Frequency	Percentage	Frequency	Percentage	Total		
Present	7	14	5	10	12		0.049
Absent	43	86	45	90	88	4.11	
Total	50	100	50	100	100		

Table 4: Association of post-operative deep SSI with respect to procedure

Deep SSI	Onlay		Sublay			Chi square test	P
	Frequency	Percentage	Frequency	Percentage	Total		
Present	5	10	3	6	8		
Absent	45	90	47	94	92	2.13	0.55
Total	50	100	50	100	100		

Table 5: Association of post-operative recurrence with respect to procedure

Recurrence	Onlay		Sublay			Chi square test	P
	Frequency	Percentage	Frequency	Percentage	Total		
Present	3	6	3	6	6		1 (>0.05)
Absent	47	94	47	94	94	0.2	
Total	50	100	50	100	100		

Table 6: Comparison of mean hospitalization days between both groups

Hospitalization days	Mean	SD	T	P
Onlay	8.52	1.8		0.001
Sublay	7.11	1.35	-3.61	(≤0.001)

Surgical techniques for the repair of incisional hernias continue to evolve with advances in prosthetic materials and minimally invasive technology. However, the optimal technique for mesh placement has not been established and remains controversial. The main issue is increased risk of infection with the placement of a foreign body in the form of a mesh.

Age and sex wise distribution

Out of 100 subjects from onlay group, majority were from 31-40 years age group. i.e., 21 (42%) whereas in sublay group 27 i.e., 54% were from 31-40 years age group. In both group majority were from same age group.

Proportion of males were 64% and 58% in onlay and sublay group respectively. Proportion of females were 36% and 42% in onlay and sublay group respectively. Mean age in onlay group was 52.8±12.6 whereas in sublay group it was 54.39±13.5 years. The difference in mean age between both groups was found to be non-significant (p>0.05).

Dharmendra et al in his study in patients undergoing onlay and sublay mesh repair for ventral hernias was compared[8] The age group of patients undergoing onlay mesh repair (group A) ranged from 23 years to 75 years, with mean age being 43.56±11.30 years. Patients undergoing sublay mesh repair (group B) ranged from 28 years to 75 years, with mean age being 48.48±13.55 years. No statistically significant difference was found between the two groups with respect to age group.

Kharde et al conducted a study in incisional hernia patients having group A with 25 patients, who underwent traditional on-lay mesh repair of incisional hernia (6 males and 19 females)[9] The age of the patients ranged from 31 to 55 years old with a mean of 53.84±13.05 years. On the other hand, group B included 25 patients, who underwent retro-rectus mesh repair (9 males and 16 females). The age of the patients in this group ranged from 28 to 57 years old with a mean of 54.24±10.86 years. There was no statistically significant difference between both groups as regards age and gender (p>0.05).

Rajsiddharth et al in his study stated that the total number of cases studied was 60[10] The study showed that the maximum number of patients were in the 4th decade of life (58.3%). There were no patients in the age groups 0-10 and 11-20. In 60 cases, 42 patients (70%) were females, and 18 patients (30%) were males.

Post-operative complications

Postoperative complication like deep SSI was seen in 10% and 6% respectively from onlay and sublay group. This proportion of deep SSI was almost equal in both the groups (p>0.05).

Kharde et al noted overall 40% prevalence of post- operative complications in his subjects after one or the other operative procedure[9] Dhaigude et al found that the overall incidence of suture site infection in his study was 18.0%.[11] The incidence of suture site infection was seen more in group A (Onlay) (26%) when compared to group B (Sublay) (12%) which is comparable with our study findings.

Seroma

Postoperative complication like seroma was seen in 14% and 10% respectively from onlay and sublay group. This proportion of seroma was more in onlay group as compared to sublay group (<0.05).

Kharde et al reported in his study that postoperative complication like seroma was seen in 16% and 12% respectively from onlay and sublay group which is higher as compared to our findings.[9] Elsesy et al noted seroma in 12.5% of the cases managed by on-lay mesh repair and 0% by pre-peritoneal mesh repair.[12] However, Gleysteen et al found 10.7% seroma rate for on-lay and 16% for pre-peritoneal mesh repair which is comparable with our study findings.[13]

Dhaigude et al found that the number of patients who developed post-operative seroma was 5 out of which 2 % were seen in group B (Sublay) and 8 % were seen in group A (Onlay) which is comparable with our study findings.[11]

Deep SSI

In our study, Postoperative complication like deep SSI was seen in 10% and 6% respectively from onlay and sublay group. This proportion of deep SSI was almost equal in both the groups ($p>0.05$).

Kharde et al reported that deep SSI was noted in only one case of group A (onlay), where the mesh got infected and had to be removed.[9] In group B (sublay), there was no incidence of mesh getting infected which is comparable with our study findings.

Gleysteen et al in their study also found that rate of infection was higher in patients treated with on-lay mesh repair than those treated with retro-rectus mesh repair.[13] Post-operative complication like mesh removal was seen in 4% patients from onlay group ($p>0.05$) which is comparable with our study findings.

Post-operative recurrence

In our study, post-op recurrence of hernia was seen in both groups equally i.e., 3 case in each group. ($p>0.05$).

Kharde et al reported a recurrence rate of 4% in group A (onlay), whereas group B(sublay) showed 0% recurrence rate.[9] Gleysteen et al found 20% recurrence rate for on-lay and 4% for pre-peritoneal mesh repair.[13]

Elsesy et al in his study noted 3.1% recurrence rate for on-lay mesh repair of incisional hernias and 0% for pre-peritoneal mesh repair.[12] Dhaigude et al experienced recurrence in present study was 1% with recurrence seen in only in 1 patient of group A (Onlay) and none in group B (Sublay).[11]

Conclusion

Sublay mesh repair has a lower rate of post-operative complications than onlay mesh repair, although larger studies are required to choose the better of the two procedures. Incidences of complications like superficial SSI are similar in both the groups, but deep SSI leading to infection of mesh is higher in on-lay mesh repair. Number of days of hospitalization in sublay group was less as compared to onlay group

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