

Original Research

To investigate Onlay and sublay mesh repair techniques in incisional hernias

Saurabh Kumar Gupta

Assistant Professor, Department of General Surgery, Vekateshwara Institute of Medical Sciences, Amroha, Uttar Pradesh, India

ABSTRACT:

Aim: To investigate Onlay and sublay mesh repair techniques in incisional hernias. **Material and Methods:** Observational research was done in the surgical department. Patients who were clinically diagnosed with incisional hernia were part of this research. 100 instances were examined within the specified time. The patients were allocated into two groups at random. Group A underwent onlay mesh repair whereas Group B had sublay mesh repair. **Results:** The bulk of the 100 participants in the onlay group were between 31 and 40 years old. In other words, out of 21 participants in one group, 42% were between 31-40 years old, whereas in another group of 27 participants, 54% fell into the same age range. Both groups consisted mostly of individuals from the same age range. The proportion of men was 64% in the onlay group and 58% in the sublay group. The proportion of females was 36% in the onlay group and 42% in the sublay group. Postoperative complications such as seroma occurred in 14% and 10% of patients in the onlay and sublay groups, respectively. The incidence of seroma was higher in the onlay group compared to the sublay group ($p < 0.05$). Postoperative complications such as deep surgical site infections occurred in 10% and 6% of patients in the onlay and sublay groups, respectively. The prevalence of deep surgical site infections was almost same in both groups ($p > 0.05$). Postoperative hernia recurrence occurred in three cases in each group, with no significant difference between the groups ($p > 0.05$). The average length of hospital stay in the onlay group was 8.52 ± 1.8 days, whereas in the sublay group it was 0.071 ± 1.35 days. The difference in mean days of hospitalization between both groups was determined to be statistically significant ($p < 0.001$). The number of days spent in the hospital was lower in the sublay group compared to the onlay group. **Conclusion:** Sublay mesh repair has a reduced incidence of post-operative problems compared to onlay mesh repair, however more extensive investigations are needed to determine the superior approach.

Keywords: Sublay, mesh, Onlay, Incisional hernias

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Corresponding author: Saurabh Kumar Gupta, Assistant Professor, Department of General Surgery, Vekateshwara Institute of Medical Sciences, Amroha, Uttar Pradesh, India

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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 descriptive observational study conducted in the department of surgery after taking the approval of the protocol review committee and institutional ethics committee. 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 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 24.0 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 ($p < 0.05$) (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
	Number	Percentage	Number	Percentage	
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
	Number	Percentage	Number	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		Total	Chi square test	P	Inference
	Number	Percentage	Number	Percentage				
Present	7	14	5	10	12	4.11	0.049	Significant
Absent	43	86	45	90	88			
Total	50	100	50	100	100			

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

Deep SSI	Onlay		Sublay		Total	Chi square test	P	Inference
	Number	Percentage	Number	Percentage				
Present	5	10	3	6	8	2.13	0.55	Not significant
Absent	45	90	47	94	92			

Total	50	100	50	100	100			
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Table 5: Association of post-operative recurrence with respect to procedure

Recurrence	Onlay		Sublay		Total	Chi square test	P	Inference
	Number	Percentage	Number	Percentage				
Present	3	6	3	6	6			
Absent	47	94	47	94	94	0.2	1 (>0.05)	Not significant
Total	50	100	50	100	100			

Table 6: Comparison of mean hospitalization days between both groups

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

DISCUSSION

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.

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).

Timmermans L 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.

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. 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 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 Postoperative

operative complication like mesh removal was seen in 4% patients from onlay group ($p>0.05$) which is comparable with our study findings. In our study, post-operative recurrence of hernia was seen in both groups equally i.e., 3 cases 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 Den Hartog D et al experienced recurrence in present study was 1% with recurrence seen in only 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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