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ORIGINAL ARTICLE

Comparison of Post-Operative Complications Between Sublay and Onlay Mesh Repair in Incisional Hernia

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ABSTRACT

Objective: To compare the post-operative complications between sublay and onlay mesh repair in incisional hernia.

Materials & Methods: This randomized controlled trial was conducted at Department of Surgery, Sandeman Provincial Hospital Quetta from May 2019 to November 2019. Total 250 patients with incisional hernias for more than 3 months, having age 20-40 years either male or female were selected. Then selected patients were placed randomly into two groups i.e. Group A (Sublay group) & Group B (Onlay group), by using lottery method. Patients were called for follow up 15th day for post-operative complications in term of wound infection and seroma formation.

Results: The mean age of patients in group A was 34.73 ± 4.32 years and in group B was 34.51 ± 4.67 years. Out of these 250 patients, 161 (64.40%) were female and 89 (35.60%) were males with female to male ratio of 1.8:1. Wound infection was seen in 07 (5.60%) patients in group A (Sublay technique) and 17 (13.60%) patients in group B (Onlay technique) with p-value of 0.033. Seroma formation was seen in 09 (7.20%) patients in group A (Sublay technique) and 26 (20.80%) patients in group B (Onlay technique) with p-value of 0.002.

Conclusion: This study concluded that rate of wound infection and seroma formation is less after sublay mesh repair for incisional hernia as compared to onlay repair.

Keywords: Hernia, incisional, onlay, sublay, seroma.

INTRODUCTION

Laparotomy performed for surgical access is expected to heal quickly in normal circumstances without any complications. Local suture tensions and intra-abdominal pressure can speak up to 16 N/cm^2 and 180 mm Hg respectively, despite the abdominal wall being in continual movement. A solid scar which is comparable to healthy abdominal walls is formed within a few weeks after the sutured abdominal walls are healed. Burst abdomen or wound dehiscence is described as the acute separation of sutured abdominal walls occurring during the post-operative phase with <1% occurrence. Sometime after surgery, hernial canal and sac can be formed due to >20% occurrence of chronic wound dehiscence often labelled as incisional hernia. [1]

Among the patients of post-operative wound infection, around 23 % of patients and 10-15% abdominal incisions will develop into incisional hernia as estimated.[2-4] Repairing should be considered as the smallest incisional hernia can potentially develop into incarceration. [5]Multiple surgical techniques has been made available to treat such hernias over the last few decades. In 1958, usher first used marlex mesh (plastic prosthetic material) to treat hernia as the primary repair had high recurrence rate. [6] In 1962, Monofilament polypropylene mesh was first manufactured. [7] Majority of the incisional hernia's patients were being treated with polypropylene mesh as it became a tension free popular method. [8]

During on-lay mesh repair the prosthetic mesh is placed in-between the anterior rectus sheath and subcutaneous tissues of the abdominal wall while in sub-lay mesh repair it is place between the posterior rectus sheath and the rectus muscle also known as pre-peritoneal plane. [9] In long term follow ups the primary suture repair had 30-35% recurrence rate in hernia as the use of polypropylene prosthetic mesh for incisional hernia has taken down the overall recurrence risk to 10-25%.[10,11]

The rationale of our study was to compare sub-lay versus on-lay mesh repair in incisional hernia with regards to post-operative complications in our general population. With lack of adequate literature on the subject and the resulting practice variation, additional data comparing sub-lay versus on-lay mesh repair in incisional hernia was needed and it would help us to take an evidence base decision with the potential to be generalized.

MATERIAL AND METHODS

This randomized controlled trial was conducted at Department of Surgery, Sandeman Provincial Hospital Quetta from May 2019 to November 2019. Total 250 patients with incisional hernias for more than 3 months, having age 20-40 years either male or female were selected.

Patients with history of Intra-abdominal malignancies, with history of severe cardio-pulmonary disease, with history of uncontrolled ascites, pregnant women, with history of recurrent incisional hernias and ASA grade III and IV were excluded from the study. Patients were randomly divided into two equal groups A (Sublay group) and B (Onlay). Preoperatively, all patients were thoroughly examined. All the patients were managed with routine antibiotic post-operatively. Patients were called for follow up 15th day for post-operative complications in term of wound infection and seroma formation. Data was collected on pre-designed proforma.

Data was analyzed by using SPSS version 20. Numerical data was presented in form of mean and SD. Categorical data was presented in form of frequencies and percentages.

RESULTS

Total 250 patients between 20-40 years were selected for this study. Overall mean age was 34.42 ± 4.52 years while in group A and B was 34.73 ± 4.32 years and 34.51 ± 4.67 years respectively.

Wound infection was seen in 07 (5.60%) patients of group A (Sublay technique) and 17 (13.60%) patients in group B (Onlay technique). Significantly (P = 0.033) higher rate of wound infection was noted in onlay group as compared to sublay group. Seroma formation was seen in 09 (7.20%) patients in Sublay group and 26 (20.80%) patients of onlay group. Statistically significant difference of seroma formation between the both study groups was noted with p value 0.002. (Table 1)

Two age groups (20-30 years and 31-40 years) were created. In age group 20-30 years, wound infection was noted in 02 (4.35%) patients of study group A (sublay group) while in 06 (12.50%) patients of study group B (onlay group) but the difference was not significant (P = 0.157). Seroma formation was seen in 04 (8.70%) patients of group A (sublay group) while in 09 (18.75%) patients of group B (onlay group) but the difference was not significant (P = 0.158). In age group 31-40 years, wound infection was noted in 05 (6.33%) patients and 11 (14.29%) patients of group A (sublay group) and B (onlay group) respectively but difference was not significant (P = 0.101). Seroma formation was noted in 05 (6.33%) patients of group A (sublay group) while in 17 (22.08%) patients of group B (onlay group). Difference was significant (P = 0.005). (Table 2)

In male patients of group A, wound infection was seen in 03 (6.98%) patients and in 05 (10.87%) patients of group B and the difference was statistically in significant with p value 0.521. Seroma formation was seen in 03 (6.98%) and 07 (15.22%) male patients of study group A and B but the difference was insignificant with p value 0.219.

Wound infection was noted in 03 (6.98%) male patients and 05 (10.87%) male patients of group A (sublay group) and B (onlay group). Difference was not significant (P = 0.521). Seroma was noted in 03 (6.98%) male patients of group A (sublay group) and 07 (15.22%) male patients of group B (onlay group). But difference was not significant (P = 0.219).

Among female patients, wound infection was seen in 04 (4.88%) patients of group A (sublay group) while 05 (10.87%) patients of group B (onlay group). Difference was significant (P = 0.029) Seroma was found in 06 (7.32%) patients and 19 (24.05%) patients of group A (sublay group) and group B (onlay group). Difference was significant (P = 0.003). (Table 3)

In ≤6 months duration of hernia group, wound infection and seroma formation was noted in 03 (4.76%) patients and 04 (6.35%) patients of study group A. In study group B, wound infection and seroma formation was noted in 10 (15.63%) patients and 15 (23.44%) respectively and the difference was statistically significant for wound infection and seroma formation with p value 0.043 and 0.007.

In >6 months duration of hernia group, wound infection was noted in 04 (6.45%) patients of group A (sublay group) and in 07 (11.48%) patients of group B (onlay group). Difference was not significant (P = 0.329). Seroma formation was noted in 05 (8.06%) patients of group A (sublay group) and in 11 (18.03%) patients of group B (onlay group). Difference was not significant (P =0.100). (Table 4)

Table 1: Comparison of wound infection and seroma formation between the both groups

Group	Wound infection P = 0.033		Seroma formation P = 0.002	
	Yes (%)	No (%)	Yes (%)	No (%)
A (Sublay technique)	07 (5.60%)	118 (94.40%)	09 (7.20%)	116 (92.8%)
B (Onlay technique)	17 (13.60%)	108 (86.40%)	26 (20.80%)	99 (79.2%)

Table 2: Relation of wound infection and seroma formation with age groups

Group	Wound infection		Seroma formation	
	Yes (%)	No (%)	Yes (%)	No (%)
Age group 20-30 years (P = 0.157) : (P = 0.158)				
A	02 (4.35%)	44 (95.65%)	04 (8.70%)	42 (91.30%)
B	06 (12.50%)	42 (87.50%)	09 (18.75%)	39 (81.25%)
Age group 31-40 years (P = 0.101) : (P = 0.005)				
A	05 (6.33%)	74 (93.67%)	05 (6.33%)	74 (93.67%)
B	11 (14.29%)	66 (85.71%)	17 (22.08%)	60 (77.92%)

Table 3: Relation of wound infection and seroma formation with gender

Group	Wound infection		Seroma formation	
	Yes (%)	No (%)	Yes (%)	No (%)
Male patients (P = 0.521) : (P = 0.219)				
A	03 (6.98%)	40 (93.02%)	03 (6.98%)	40 (93.02%)
B	05 (10.87%)	41 (89.13%)	07 (15.22%)	39 (84.78%)
Female patients (P = 0.029) : (P = 0.003)				
A	04 (4.88%)	78 (95.12%)	06 (7.32%)	76 (92.68%)
B	12 (15.19%)	67 (84.81%)	19 (24.05%)	60 (75.95%)

Table 4: Relation of wound infection and seroma formation with duration of hernia

Group	Wound infection		Seroma formation	
	Yes (%)	No (%)	Yes (%)	No (%)
≤6 months duration (P = 0.043) : (P = 0.007)				
A	03 (4.76%)	60 (95.24%)	04 (6.35%)	59 (93.65%)
B	10 (15.63%)	54 (84.37%)	15 (23.44%)	49 (76.56%)
>6 months (P = 0.329) : (P = 0.100)				
A	04 (6.45%)	58 (93.55%)	05 (8.06%)	57 (91.94%)
B	07 (11.48%)	54 (88.52%)	11 (18.03%)	50 (81.97%)

DISCUSSION

The objective of the study was to compare the post-operative complications between sublay and onlay mesh repair in incisional hernia. Age range in this study was from 20 to 40 years with mean age of 34.42 ± 4.52 years. The mean age of patients in group A (Sublay technique) was 34.73 ± 4.32 years and in group B (Onlay technique) was 34.51 ± 4.67 years. Wound infection was seen in 07 (5.60%) patients of group A (Sublay technique) and 17 (13.60%) patients in group B (Onlay technique). Significantly (P = 0.033) higher rate of wound infection was noted in study group B as compared to study group A. Seroma formation was seen in 09 (7.20%) patients in group A (Sublay technique) and 26 (20.80%) patients in group B (Onlay technique). Statistically significant difference of seroma formation between the both study groups was noted with p value 0.002.

In a meta-analysis, surgical site infection occurred significantly less after sublay repair as compared to only repair and hematoma and seroma formation found with insignificant difference.[12] In a recent study Aoda FS and his associate has reported wound infection by 4% and seroma formation by 24% in onlay technique group as compare to wound infection by 4% and seroma formation by 2% in sublay technique group.[5] In another recent study Murad QA and his associate has reported wound infection by 12% and seroma formation by 23.3% in onlay technique group as compare to wound infection by 3.6% and seroma formation by 5.04% in sublay technique group.[13] In a study, wound infection was seen in 04 (10.0%) patients in group A (Sublay technique) and 02 (5.0%) patients in group B (Onlay technique) with p-value of 0.019. Seroma formation was seen in 00 (0.0%) patients in group A (Sublay technique) and 03 (7.50%) patients in group B (Onlay technique) with p-value of 0.076.[14] In study of Jameel et al, [15] wound infection and seroma formation was noted in 10.8% patients and 7.8% patients respectively in sublay group while in onlay group wound infection was noted in 22.8% patients and seroma formation was noted in 18.6% patients respectively. Jat MA and his associates has reported wound infection by 5% and seroma formation by 7% in sublay technique group.[16] Leithy M et al[17] in his study has reported frequency of

wound infection as 40% while seroma formation as 40%. A European study reported higher complication rate in onlay group as compared of sublay gourp. [18]

CONCLUSION

This study concluded that rate of wound infection and seroma formation is less after sublay mesh repair for incisional hernia as compared to onlay repair. So, we recommend that sublay mesh repair for incisional hernia should be used as a first line treatment for the incisional hernia in order to reduce the morbidity of these particular patients.

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