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Research Article

A PROSPECTIVE COMPARISION STUDY BETWEEN SUTURE AND MESH REPAIR FOR INCISIONAL HERNIA IN A TERTIARY CARE CENTER

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A R T I C L E I N F O

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A B S T R A C T

Background: Incisional hernia (IH) is defined by the European hernia society as "any abdominal wall gap with or without a bulge in the area of postoperative scar perceptible or palpable by clinical examination or imaging". Procedures for the repair of these hernias with sutures and with mesh have been reported. There is no consensus about which type of procedure is best. **Aim and objectives:** To compare the results of mesh and suture repair of incisional hernia for hospital stay, complications and recurrences. **Material and Methods:** A total of 60 patients from with incisional hernia were included at Department of General Surgery, Patna Medical College, Patna during July 2014 to June 2016. The patients were randomized in two groups (Group A and Group B) with odds and even number method. Group A (n=30) was subjected to Mesh repair and Group B (n=30) incisional hernia was repaired with suture technique. **Results:** Age in yrs and BMI in kg/m^2 related to both groups A and B not having much difference i.e. 42.22 ± 15.21, 42.61 ± 15.37 & 26.61 ± 05.16, 26.63 ± 05.23 respectively. Hospital stay in mesh repair was less than the sutures repair i.e. 06.29 ± 01.68 in comparison to 09.38 ± 01.75. Over all females shows more cases 37 (61.70%) in comparison to males 23 (38.30%). Suture repair showed more complications than mesh repair i.e. 8 out of 10 i.e. 80%. Most of the cases undergoing mesh repair (90.00%) showed more satisfaction than suture repair (73.33%). **Conclusion:** Mesh repair is better technique for repair of incisional hernia, because it has less recurrence rate and satisfactory to patients.

INTRODUCTION

Incisional hernia (IH) is defined by the European hernia society as "any abdominal wall gap with or without a bulge in the area of postoperative scar perceptible or palpable by clinical examination or imaging". Development of IH can follow any type of surgical incision, whatever its site or size, even the incision of the laparoscope trocar can cause it (1). The number of articles published and indexed in PubMed, about IH increased by 3.9‐fold during the decades 1991–2000 and 2001–2010, indicating the importance of the issue of IH (2). In prospective studies with sufficient follow-up, primary incisional hernia occurred in 11 to 20 percent of patients who had undergone laparotomy. Such hernias can cause serious morbidity, such as incarceration (in 6 to 15 percent of cases) and strangulation (in 2 percent) (3).

Its incidence is dependent on the acting risk factors. IH can develop at different times from surgery, but 90% of IHs occurs during the first 3‐year of surgery. It varies between 11% and 20% in uncomplicated wounds.

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The incidence is higher in the presence of specific risk factors and in special situations. IH develops more common following midline incisions than other incisions (4).IH is more prevalent following open resection than laparoscopic resection of the colon (18% vs. 7%) (5).

The unchanged incidence of IH over the last decades can only be explained by the presence of biological factors that are individual dependent. These factors include: Synthesis of different types of collagen, enzymes defects, smoking and some nutritional deficiencies (6). Defective collagen metabolism and synthesis is one of the major factors involved in the development of IH. Patients with IH have a reduced ratio of collagen I: Collagen III as well as a reduced ratio of matrix metalloproteinase 1 (MMP1) to MMP2. These reductions in the synthesis of different types of collagen and enzymes play a role in the development of IH (7).Smoking apart from reducing the oxidative killing mechanism of neutrophils, it can also decrease collagen synthesis and produces a decrease in collagen I to collagen III ratio. Smoking also increases the degradation of the connective tissue as a consequence of enhancing the imbalance between protease activity and their inhibitors (8).

This study is conducted to show the compare the results of mesh repair with suture repair of an incisional hernia with regard to recurrence.

Objectives: The objective of this study was to Compare the results of mesh and suture repair of incisional hernia for hospital stay, complications and recurrences.

MATERIAL AND METHODS

This study was conducted at Department of General Surgery, Patna Medical College, Patna during July 2014 to June 2016. Atotal of 60 patients with incisional hernia were included. Patients of incisional hernia of any gender below seventy years of age were included. The patients were randomized in two groups (Group A and Group B) with odds and even number method. Group A (n=30) was subjected to Mesh repair and Group B (n=30) incisional hernia was repaired with suture technique.

Study Design: Quasi Experimental study. ***Inclusion criteria:*** All patients with primary incisional hernia. ***Exclusion criteria:*** The presence of more than one hernia, signs of infection, prior hernia repair with mesh, plan to repair the hernia as a part of another intra-abdominal procedure, patient with significant respiratory illness, associated malignancy also having associated diseases like diabetes mellitus, chronic liver disease, ascites and intra-abdominal mass, urinary bladder outflow obstruction, constipation and chronic cough were excluded. ***Mesh Repair:*** A mesh of double the size of the approximate size of defect was chosen and Onlay technique used to anchor the mesh over the defect after approximation of muscle layers. The mesh was anchored at four to six sites with interrupted mono filament Prolene suture and then all the margins were stitched to dissected margin of the wound. The wound closed over a simple drain. ***Suture Repair:*** After dissection was complete, in this group simple approximation of layers was done with mono-filament suture (Prolene). Wound closure was obtained over drain.

Follow-up of cases was done after 1, 6, 12, and 15 months after surgery on an outpatient basis for recurrence of hernia.

RESULTS

A total of 60 patients with incisional hernia were divided in two groups. Group "A" comprised of 30 patients who underwent hernia repair with mesh and group "B" comprised of 30 patients who underwent suture repair.

Table 1 Baseline Characteristics of the Patients with Incisional Hernia, According To Study Groups

Variables		Group A(mesh repair, N=30)	Group B (suture repair, N=30)
Age --yrs	Mean ± S.D	42.22 ± 15.21	42.61 ± 15.37
Body mass index (BMI)	Mean ± S.D	26.61 ± 05.16	26.63 ± 05.23
Main reason for repair			
Gastrointestinal Surgery		11 (36.67%)	13 (43.33%)
Laparoscopic Surgery		04 (13.33%)	01 (03.33%)
LSCS		05 (16.67%)	10 (33.34%)
LSCS+BAT		03 (10.00%)	00 (00.00%)
LSCS+Hysterectomy		00 (00.00%)	02 (06.67%)
LSCS+Tubectomy		00 (00.00%)	03 (10.00%)
Tubectomy		07 (23.33%)	01 (03.33%)
Duration of hospital stay	Mean ± S.D	06.29 ± 01.68	09.38 ± 01.75

LSCS: Lower segment cesareansection, BAT: Bilateral Abdominal Tubectomy, S.D: Standard deviation

Table 1 shows that Age in yrs and BMI in kg/m^2 related to both groups A and B not having much difference i.e. 42.22 ± 15.21, 42.61 ± 15.37 & 26.61 ± 05.16, 26.63 ± 05.23 respectively. Also shows that in group A reason for mesh repair was mostly gastro-intestinal surgeries (36.67%) followed by gynaecological surgeries like tubectomy (23.33%) but for group B reason for suture repair mostly was gastro-intestinal surgeries (43.33%) followed by gynaecological surgeries like LSCS (33.34%). Hospital stay in mesh repair was less than the sutures repair i.e. 06.29 ± 01.68 in comparison to 09.38 ± 01.75.

Table 2 Age and Sex Distribution according To Study Groups

Age in years	Group A(mesh repair, N=30)		Group B (suture repair, N=30)	
	Male (%)	Female (%)	Male (%)	Female (%)
10 - 19	00 (00.00%)	01 (03.33%)	00 (00.00%)	01 (03.33%)
20 - 29	02 (06.67%)	05 (16.67%)	04 (13.33%)	01 (03.33%)
30 - 39	04 (13.33%)	04 (13.33%)	01 (03.33%)	07 (23.33%)
40 – 49	01 (03.33%)	04 (13.33%)	01 (03.33%)	01 (03.33%)
50 – 59	01 (03.33%)	03 (10.00%)	02 (06.67%)	05 (16.67%)
60+	03 (10.00%)	02 (06.67%)	04 (13.33%)	03 (10.00%)

Table 2 shows that mostly group A cases and group B cases belong to same age group 30-39 years i.e. 26.66% (male, female- 13.33% & 13.33% and 03.33% & 23.33% respectively).Over all females shows more cases 37 (61.70%) in comparison to males 23 (38.30%).

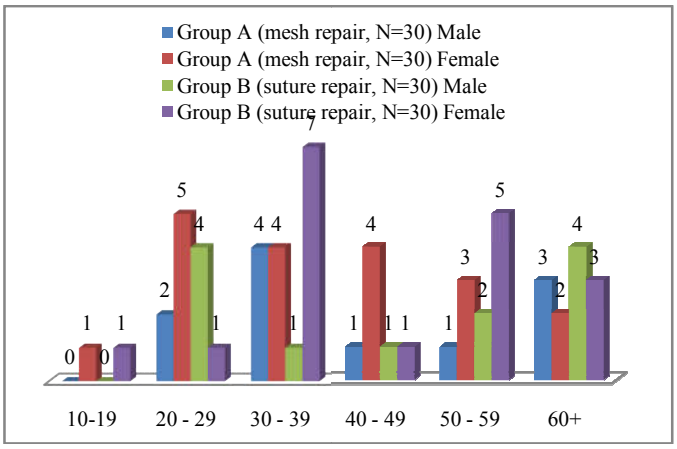

Figure 1 Age and Sex Distribution according To Study Groups

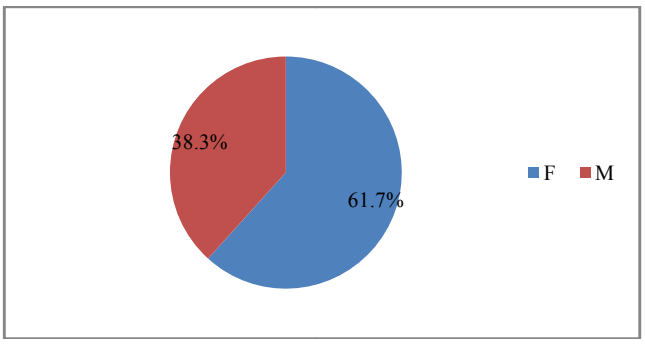

Figure 2 Over all sex distribution in studied cases

M: Male, F: Female

Table 3 Post-operative complications

Post-operative complications (10)	Number of patients		Percentage
	Group A	Group B	
Subcutaneous seroma	01	02	30.00%
Wound infection	01	03	40.00%
Subcutaneous hematoma	00	02	20.00%
Wound sinus	00	01	10.00%
Total	02	08	100.00%

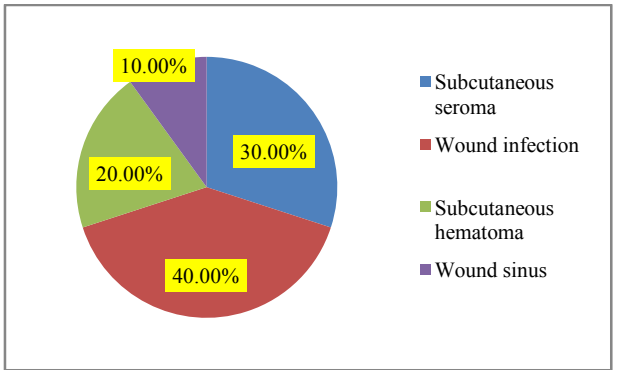

Figure 3 Post-operative complications

Table 3 shows post-operative complications out of that mostly were wound infection i.e. 40.00% followed by sub cutaneous seroma i.e. 30.00% respectively.

Suture repair showed more complications than mesh repair i.e. 8 out of 10 i.e. 80%.Similarly subcutaneous seroma 01/02, wound infection 01/03, subcutaneous hematoma 00/02 and wound sinus 00/01 represent group A and group B complications.

Table 4 Results of multivariate analysis of factors affecting the rates of recurrence after repair of incisional hernia

Factor		No. of patients	No. of recurrences	%	p-value
Type of repair	Mesh	30	03	10.00%	0.164
	Suture	30	08	26.67%	
Infection	No	56	08	14.28%	0.035
	Yes	04	03	75.00%	
Age	<60 yrs	48	06	12.50%	0.068
	>60 yrs	12	05	41.66%	
Hospital stay	<5 days	08	01	12.50%	0.697
	>5 days	52	10	19.23%	
Body mass index (BMI)	<25	24	04	16.67%	0.820
	>25	36	07	19.44%	
Gender	Male	23	05	21.74%	0.656
	Female	37	06	16.21%	

Result significant if p-value <0.05.

Table 4 shows that suture repair (26.67%) had more recurrences than mesh repair (10.00%). Similarly infection as a post-operative complication had more recurrences than other complications i.e. 75.00% and result is significant as p value < 0.05. Patient with hospital stay >5 days i.e. 19.23%, BMI of >25 kg/m^2 i.e. 19.67% and female i.e. 16.21% had more recurrences. Overall recurrences found in both groups A & B was 18.33%. Most of the cases undergoing mesh repair (90.00%) showed more satisfaction than suture repair (73.33%).

DISCUSSION

Incisional hernia remains a frequent complication of abdominal and occasionally of lumbar surgery, with a reported incidence of 2% to 20%.In present study, majority of patients (16 i.e. 26.66%) belonged to age group 30 to 39 followed by 12 i.e. 20.00% patients of age group >60 years. In a study by Bhat M *et al* (8) it was noted that highest incidence of incisional hernia was in the 5thdecade of life in females and the 6th decade of life in males. In our study among 60 patients, 37 (61.70%) were females and 23 (38.30%) were males. So male to female ratio was 1:1.5. In study by Waqar T *et al* (9), it was observed that male to female ratio was 1:1.85. In another study by Nur NA *et al* (10), this ratio was 1:1.4.Obesity was another main risk factor for development of incisional hernia. 36 (60.00%) of patients in present study were obese, which showed more recurrences i.e. 19.44%. While Solandi RA *et al* (11), found obesity as a risk factor for incisional hernia in 11.55% of patients. It has always been a problem for surgeon and patient in terms of satisfaction of results. Multiple techniques have been used for its repair. In present study most of the cases undergoing mesh repair (90.00%) showed more satisfaction than suture repair (73.33%) (P= 0.16). While in a study by Jacobus W.A *et al* (12) among the suture repair group, 64% was satisfied, while in the mesh repair group, 77% were satisfied (P = 0.12).

Suture repair showed more complications than mesh repair i.e. 8 out of 10 i.e. 80%.Similarly subcutaneous seroma 01/02 i.e. 30.00%, wound infection 01/03 i.e. 40.00%, subcutaneous hematoma 00/02 i.e. 20.00% and wound sinus 00/01 i.e. 10.00% represent group A and group B complications. Shivakumar T *et al* (13) showed wound infection was 3 out of 23 i.e. 13.04%.Other complication noted in our study was subcutaneous seroma formation. Matapurkar *et al* (14) reported no seroma formation because their mesh was incorporated into a peritoneal sandwich. Formation of seroma was reported to be 5.8% by Usher *et al* (15), despite the subcutaneous position of the mesh andthe extensive dissection involved. Jacobs *et al* (16) reported a 45% seroma rate whether suction drains were used or not. Subcutaneous hematoma is also a complication of incisional hernia repair. In a study by khaira HS *et al* (17), one (3%) out of thirty five patients developed hematoma. Waqar T *et al* (9) has found sinus formation 2.5% after mesh repair of incisional hernia. In present study mean post-operative hospital stay was 06.29 days for mesh repair and 09.38 days for suture repair. In one study by khaira *et al* (17), it was reported that Postoperative in-hospital stay ranged from 1 to 27 days with a mean of 6.2 days. After repair of incisional hernia, the most important late complication to assess the results of repair is recurrence. Suture repair (26.67%) had more recurrences than mesh repair (10.00%). Waqar T *et al* (9) reported (2.5%) recurrence after mesh repair of incisional hernia. Cassar K *et al* (18) carried out a study at Raigmore Hospital U.K, reported that recurrence rate after open suture repair may be as high as 31–49 per cent; for open mesh repair it is between 0 and 10 per cent. In another study by Read RC *et al* (19), it was reported that suture repair has recurrence rate of 12% to 54 %. Luijendijk RW *et al* (3) had same recurrence rate of 12% to 54% after suture repair. In two other international studies one carried by Korenkov M *et al* (20) and other study by Toniato A *et al* (21) reported same range of recurrence rates of 2% to 36% after mesh repair of incisional hernia. These results are comparable to our study.

CONCLUSION

The data presented in this study is suggestive that mesh repair is better technique for repair of incisional hernia, because it has less recurrence rate and satisfactory to patients.

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