

# Evaluation of Effectiveness of Prolene Mesh Repair in Incisional Hernia: A Hospital Based Study

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## ABSTRACT

**Background:** Incisional hernia is a continual complexity of surgery in abdomen. In larger hernias, the suture repairing involved the relevance of tension to the fascia in order to close the orifice. The aim of this study is to compare the incidence of recurrence rates in suture versus mesh repair to small and large incisional hernias.

**Materials & Methods:** A prospective clinical hospital based study done on 50 patients were randomly assigned to undergo suture repair or mesh repair. Location of hernia and size of the defect was noted. Follow-up of cases was done after 3 and 6 months after surgery on an outpatient basis for recurrence of hernia.

**Results:** The majority of cases (42%) were seen in 40-49 years of age group, overall female to male ratio was 1.38:1 in our study. Type of incision was mostly transverse over swelling 56% & midline incision was given 32% of patients in group A and transverse incision was 40% in group B. Most common post-operative complication was 24% chest infection, followed by 20% wound infection in group A and fever was present 16% in group B. The mostly cases were well built and have 27%

wound infection present in these type of patients. Mostly infection occurred in obese patients (33.3%).

**Conclusion:** In patients with incisional hernia, restoration with polypropylene mesh is superior to suture repair group with concern to the recurrence of hernia. Suture repair is found to have an unsatisfactory high recurrence rate.

**Keywords:** Incisional Hernia, Wound Infection, Mesh Repair, Recurrence.

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## INTRODUCTION

Inguinal hernia is the most common diversity accounting for roughly 75% of all hernia. In the 1990s, mesh hernioplasties became most commonly used, whereas in Finland, the widely used Bassini procedure was almost entirely replaced by tension free Lichtenstein mesh hernioplasty<sup>1</sup>, because Bassini repair was related with high recurrence rate as compared to Lichtenstein mesh repair.<sup>2</sup>

More than 2 million laparotomies are executed per annum in the US, with a reported incidence of incisional hernia 2% to 11%.<sup>3</sup> Suture repair techniques have prominent repairing of ventral and incisional hernia over a century. The most standard of these techniques was the Mayo repair. In larger hernias, the suture repairing involved the relevance of tension to the fascia in order to close the orifice. The technique of hernia repair is usually based on custom rather than evidence.<sup>3</sup> According to data there is a good observation that open mesh repair is better than suture repair in terms of recurrences. And also an insufficient data to reveal as which type of mesh or which position of mesh (onlay- or sublay) should be used.<sup>4</sup> The aim of this study is to compare the incidence of recurrence rates in suture versus mesh repair to small and large incisional hernias.

## MATERIALS & METHODS

A prospective clinical hospital based study done on 50 patients were randomly assigned to undergo suture repair or mesh repair. Location of hernia and size of the defect was noted. In suture repair, continuous polypropylene no-1 stitches with stitch width and interval of approximately 1 cm were used. In mesh repair polypropylene mesh was used over the fascia (overlay) with at least 4 cm of mesh overlapping the edges and fixed with polypropylene stitches to the fascia. Suction drain was used in most of the patients.

Factors related to the operation including the surgical technique, presence or absence of seroma, hematoma, infection, dehiscence were recorded. Follow-up of cases was done after 3 and 6 months after surgery on an outpatient basis for recurrence of hernia.

## Inclusion Criteria

- Age between 10-70 years
- Patients with incisional hernia post laparotomy

## Exclusion Criteria

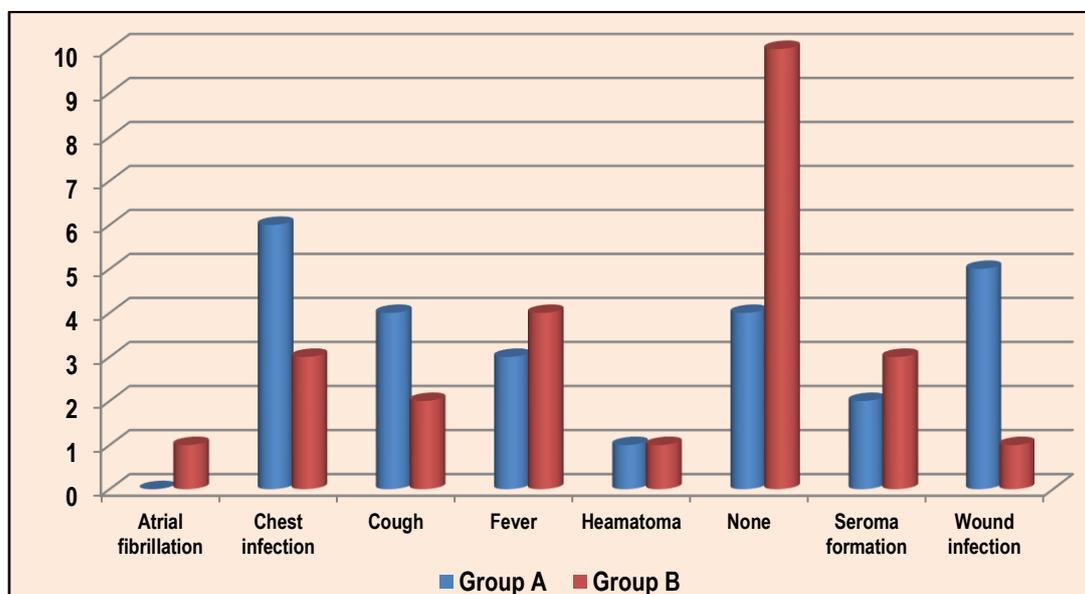
- Laparoscopic incision site hernia were excluded
- Pregnant females with incisional hernia

**Table 1: Age wise distribution of cases**

Age distribution (yrs)	No. of patients	%
20-29	2	4%
30-39	4	8%
40-49	21	42%
50-59	14	28%
60-69	9	18%
Total	50	100%

**Table 2: Types of Incisions during incisional hernia repair**

Type of incision	Group A (Suture repair)		Group B (Mesh repair)	
	No. of patients	%	No. of patients	%
Mid line	8	32%	4	16%
Pffannenstial	0	0%	2	8%
Right inguinal incision	0	0%	2	8%
Right lumber incision	0	0%	1	4%
Right paramedian	1	4%	4	16%
Right sub costal over previous scar	2	8%	1	4%
Supra umbilical over previous scar	0	0%	1	4%
Transverse	14	56%	10	40%
Grand total	25	100%	25	100%



**Graph 1: Post-operative complications**

**Table 3: Follow-up at 3 months**

Follow Up of 3months	Group A (Suture repair)		Group B (Mesh repair)	
	No. of patients	%	No. of patients	%
Normal	19	76%	14	56%
Pain	6	24%	5	20%
Sensation of foreign body	0	0%	6	24%
Grand total	25	100	25	100

**Table 4: Follow-up at 6 months**

FOLLOW UP of 6 MONTH	Group A (Suture repair)		Group B (Mesh repair)	
	No. of patients	%	No. of patients	%
Normal	18	72%	24	96%
Recurrence	7	28%	1	4%
Grand total	25	100	25	100

Chi-square test, 1 degree of freedom, P=0.0488\*

**Table 5: Correlation between obesity and wound infection**

Health	No of Patients	Wound infection	%
<b>Obese</b>	9	3	33.3
<b>Well Built</b>	37	10	27.0
<b>Poorly Built</b>	4	1	25.0

## RESULTS

The majority of cases (42%) were seen in 40-49 years of age group, overall female to male ratio was 1.38:1 in our study. Type of incision was mostly transverse over swelling 56% & midline incision was given 32% of patients in group A and transverse incision was 40% in group B (table 2). Most common post-operative complication was 24% chest infection, followed by 20% wound infection in group A and fever was present 16% in group B (graph 1).

The mostly complication of pain present in 24% patients in group A and 20% in group B after 3 months post-operatively (table 3). The follow up at 6 months the recurrence of hernia was present in 28% cases in group A and 4% in group B. It was statistically significant ( $P=0.0488^*$ ) (table 4).

The mostly cases were well built and have 27% wound infection present in these type of patients. Mostly infection occurred in obese patients (33.3%) (table 5).

## DISCUSSION

Incisional hernia is a continual complexity of surgery in abdomen. In the prospective studies with adequate follow-up, the incidence of primary incisional hernia was 11%-20% in patients who had encountered surgical laparotomy.

In our study the mean age of presentation was 48 years (range 20-68 years) and female to male ratio was 1.38:1. As per the Maingot's studies, mean age was around 45 years.<sup>5</sup> Another study done by Bhutia WT et al study, the female:male ratio was 2:1 with female preponderance 84%.<sup>6</sup> T Shivakumar et al (2016)<sup>7</sup> found most of the patients were between 20 and 50 years & male: female was 1:16.5., these are conflict with our results.

In our study we took transverse incision (56%) as compared to midline incision (32%) in group A while transverse incision given (40%) and mid line incision given 16% in group B. A similar our result with the study done by Burger et al. (2002)<sup>8</sup> stated that remarkably less incisional hernias were occurred when given transverse, oblique and paramedian incisions as compared to the midline incisions. Grantcharov and Rosenberg (2001)<sup>9</sup> reported lower incidence of late incisional hernia when tranverse incision was given.

Liang MK et al (2013)<sup>10</sup> reported a risk of incisional hernia was more in long incision than compare to short incision. Multiple incisions destroy nerve and vascular supply.

Our results suggested that the most common post-operative complication was chest infection (24 %) in group A, followed by wound infection (20 %) in group A. Wound infection is the major etiologic factor of post-operative herniation having a high tendency for fascial necrosis with significant loss of stability of the closure. Sepsis is the second major cause of quickly wound failure, in more than 50% of post-operative hernias that develop in 1st year after operation (Jack Abrahamson).<sup>11</sup> Approximately, 35-40% of incisional hernias occur with a wound infection in documentation, but the reported incidence of hernia in treated wound infections varies from 5% to 20% (Baker).<sup>12</sup> Post-operative wound infection

was related with five times increase in the risk of development of a hernia (23%) as only 4.5% incidence in patients with uninfected wounds.<sup>36</sup> Similar findings had been reported earlier by Blomstedt and Welin Berger (1972). Incisional hernia occurs in 23% of those who develop postoperative wound infection.<sup>13</sup>

Our study observed that post-operative pain was present in 6 patients (24%) in suture group as compared to 5 patients (20%) in mesh group at 3 months follow up. A similar results found by Roland W. Luijendijk et al (200)<sup>14</sup>, the frequency of pain one month after surgery was similar in the two treatment groups (suture-repair group, 19 patients [20 percent]; mesh-repair group, 15 patients [18 percent]). The pain usually disappeared after the first month.

Recurrence rate were high in suture group A (28%) as compared to mesh group B (4%). In techniques for the repair of incisional hernias in which sutures are used, the edges of the defect are brought together, which may lead to excessive tension and subsequent wound dehiscence or incisional herniation as a result of tissue ischemia and the cutting of sutures through the tissues.<sup>15</sup> With prosthetic mesh, defects of any size can be repaired without tension. In addition, polypropylene mesh, by inducing an inflammatory response, sets up a scaffolding that, in turn, induces the synthesis of collagen. Our study establishes the superiority of mesh repair over suture repair with regard to the recurrence of hernia.

## CONCLUSION

In patients with incisional hernia, restoration with polypropylene mesh is superior to suture repair group with concern to the recurrence of hernia. Suture repair is found to have an unsatisfactory high recurrence rate. Even in small defect incisional hernias mesh repair provides better results than suture repair modalities.

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