

# Comparative Study of Mesh versus Suture Repair in Less than 3 cm Umbilical Hernia Defect in Adults

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## Abstract

**Introduction:** The use of prosthetic material (mesh) has been advocated for use in recent times for repair of umbilical hernias. The present study was done with the aim to compare the complications and recurrence rates between the mesh repair and suture repair groups in cases of umbilical hernia.

**Materials and Methods:** This study was done in the Department of General Surgery at Indira Gandhi Institute of Medical sciences, Patna, Bihar, over a period of 2 years in 120 patients. Prior Institutional Ethical Committee approval was also obtained for this study.

**Results:** Out of 120 patients included in this study, maximum number of patients were males. Male-to-female ratio was 1.7:1. Among the mesh group, 1.67% of patients had recurrence while 8.33% of patients in suture repair group had recurrence. Infection rate was less in mesh repair group as compared to suture repair group (1.67% vs. 5%).

**Conclusion:** Widely accepted method for ventral hernias is tension-free mesh repair which is accepted globally. Primary suture repair is a type of surgery for umbilical hernia with which most of the surgeons are comfortable with especially for small hernias. Recent articles which have been published worldwide including good RCT suggest mesh repair to be the gold standard repair for all umbilical hernias with defect size measuring 1–3 cm

**Key words:** Infection, Mesh, Recurrence, Umbilical hernia

## INTRODUCTION

Umbilical hernia is primarily a ventral hernia in midline. Among all adults suffering from ventral hernia defect, 14% of those cases account for umbilical hernia. As per the European Hernia Society, any defect of 3 cm above and below the umbilicus is considered as umbilical hernia defect.<sup>[1]</sup> In most cases, hernia consists of a rigid and fibrotic hernia gap that does not enlarge, but a hernia sac that enlarges substantially. When an umbilical hernia becomes symptomatic with a risk of incarceration, surgical repair is usually required. As per study conducted by various researchers, increasing evidences suggest that the use

of prosthetic mesh is a preferable and standard method of hernia repair.<sup>[2]</sup> Various predisposing factors are there suggesting the development of umbilical hernia. Some of these factors are pregnancy, obesity, ascites, chronic cough, large intra-abdominal tumor, and high work activity such as lifting and carrying heavy loads which cause umbilical hernia due to increased intra-abdominal pressure.<sup>[3]</sup> Neck of these umbilical hernias is usually narrow which can lead to a lot of complications if not diagnosed or left untreated. There can be varying complications such as strangulation, incarceration, obstruction, skin ulceration, and rupture. As per study done by various researchers in recent years, as far as umbilical hernia of more than 3 cm size is considered, repair with mesh has been considered as the standard repair procedure.<sup>[4]</sup> However, there has been varying opinion and much debate in umbilical hernia of size <3 cm. A retrospective study of done in 393 patients compared patients with open mesh repair and patients with open primary suture repair and both groups were followed for 30 months but there was no difference of recurrence

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rate.<sup>[5]</sup> As per a recent lancet publication which has shed light with reference to small umbilical hernia of diameter between 1 and 4 cm in 300 patients from various hospitals in two groups – mesh and suture repair, there recurrence rate was lower in mesh group as compared to open repair group (4% vs. 11%). As far as evaluation of post-operative pain was considered, chronic pain after mesh repair was a major factor in considering these types of repair.<sup>[6]</sup> Various literature with regard to mesh repair and placement found out that the recurrence rate and post-operative infection rate of retrorectus and underlay technique were the lowest. Major issues were factors such as post-operative pain, infection rate, and recurrence. Hence, the present study was done with the aim to compare the complications and recurrence rates between the mesh and suture groups after 1 year of follow-up, also to compare the results between mesh placed in sublay and onlay levels, and to evaluate proficiency of materials of mesh used (polypropylene and light weight mesh).

### MATERIALS AND METHODS

The present study was done in total of 120 patients who visited Department of General Surgery over a period of 2 years at Indira Gandhi Institute of Medical Sciences, Patna. All patients above 18 years and <65 years were taken up in the study. Patients after clinical diagnosis underwent ultrasonography of whole abdomen to exclude other similar conditions and to assess the defect size and include patients with size of defect <3 cm in diameter. All the eligible participants with primary umbilical hernia of diameter 1–3 cm were randomly assigned 1:1 intraoperatively to either mesh repair or suture repair. Mesh repair was done by light macroporous and polypropylene mesh and suture repair was done using 1–0 Prolene sutures and with interrupted sutures. Details regarding the data and results were recorded separately for both groups of patients. Postoperatively, patients were followed up at regular intervals for the development of complications, if

any or recurrence. All results were evaluated by Microsoft Excel sheet and were analyzed by SPSS software.

### RESULTS

In the study, 120 patients were enrolled and analyzed with 60 patients in the mesh repair group and 60 patients in the suture repair group. A total number of males were 76 as compared to females whose number was 44 with male-to-female ratio being 1.7:1. Among the mesh group, 1.67% of patients had recurrence while 8.33% of patients in suture repair group had recurrence [Table 1]. This was confirmed by clinical examination and ultrasound of whole abdomen. Most of recurrence in both groups were found when patients were followed after 6 months of repair. Complications that were mainly found were seroma formation, chronic pain, and few cases of superficial surgical site infections [Table 2]. Seroma formation was found in 6.66% of patients in mesh repair group and 3.33% of patients in suture repair group [Figure 1]. Chronic pain was not significant as it was slightly less in mesh group as compared to suture repair group. Furthermore, infection rate was less in mesh repair group as compared to suture repair group (1.67% vs. 5%). On evaluating the mesh group in detail, there was no difference in recurrence rate or complications when results of light macroporous mesh were compared to polypropylene mesh. Further in the mesh repair group, seroma formation was more common in onlay mesh repair when compared to

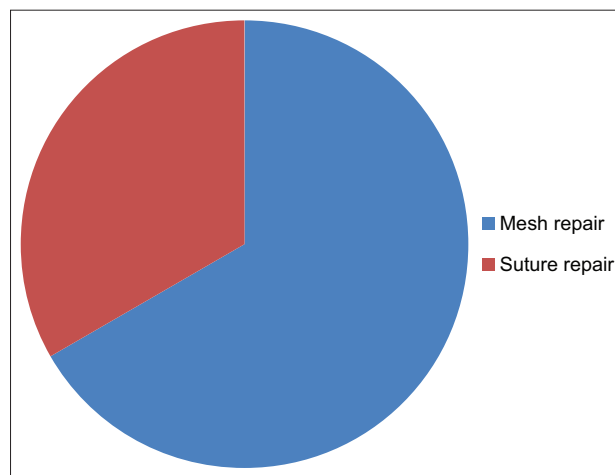


Figure 1: Seroma formation among mesh and suture repair groups

Table 1: Recurrence rate among mesh and suture repair group

Technique of repair (n=120)	Recurrence rate (%)
Mesh repair group (1/60)	1.67
Suture repair group (5/60)	8.33

Table 2: Incidence of various post-operative complications in mesh repair and suture repair group

Complications	Mesh repair group n=60				Suture repair group n=60			
	Total (post-operative till 3-month follow-up)	1-week follow-up (n=30)	1-month follow-up (n=30)	3-month follow-up (n=30)	Total (post-operative till 3-month follow-up)	1-week follow-up (n=30)	1-month follow-up (n=30)	3-month follow-up (n=30)
Pain	4 (6.67%)	4 (6.67%)	0	0	5 (8.33%)	4 (6.67%)	1 (1.67%)	0
Infection	1 (1.67%)	1 (1.67%)	0	0	3 (5%)	3 (5%)	0	0

pre-peritoneal mesh placement. There was no difference in recurrence rate or other complications between these two mesh placement layers in abdominal wall.

## DISCUSSION

Incidence of males is higher as compared to females in cases of umbilical hernia which is also evident from the present study.<sup>[7]</sup> Umbilical hernia repair is important surgical intervention as treatment failure of even smallest of umbilical hernia leads to its recurrence and due to its complications such as strangulation and incarceration.<sup>[8]</sup> Defect of more than 3 cm is unanimously advocated to be repaired by mesh. In our study, we evaluated patients with defect of <3 cm, mesh repair group had clear advantage in reducing the recurrence rate but this comes a cost of increasing seroma formation. As far as pain is considered, chronic pain at the incision site was treated with oral nonsteroidal anti-inflammatory drugs with reassurance and none complained of the same after 6 months follow-up. Light weight mesh showed no extra benefit over polypropylene mesh in terms of recurrence rates of complications.<sup>[9]</sup> It only added to additional cost to be borne by the patient. After analyzing data of 332 patients from a public database of military veteran patients who were followed up for 8.5 years, the recurrence rate for open mesh repair was 2.4% and it was 9.8% for open suture repair.<sup>[10]</sup> In another study with 200 patients in two groups, in which primary interrupted suture repair and polypropylene mesh repair was done, recurrence rate was 11% in suture repair compared to 1% with mesh repair.<sup>[11]</sup> These various data are quite comparable with the present study. Mesh that was placed in pre-peritoneal space had slight advantage over onlay repair in seroma formation or rate of superficial surgical site infections.<sup>[12,13]</sup> As per data of our study, we advocate the use of mesh in patients with <3 cm defect. Even defect of any size will do well with mesh repair without adding any misery to the patient. Use of polypropylene mesh is equally good when compared to expensive light weight mesh<sup>[14]</sup> and sublay repair is more favorable than onlay method. There is no adverse consequence of using mesh even if laparotomy is required in future. No complication was serious enough to dissuade its wider use. The repair of umbilical hernia in adults and the optimal methodology of surgery remains controversial,<sup>[15]</sup> but in recent times, use of mesh has been preferred as the standard treatment and should be done in all cases either by open or laparoscopic technique. Recurrence of these hernias is a major challenge to the operating surgeon. Ascites is one of the well-known factors for recurrence of these hernias.

Apart from this, obesity and excessive weight gain in the post-operative phase are also potential risk factor for recurrence.<sup>[16]</sup>

## CONCLUSION

Repair of umbilical hernia is one of the most frequent operations performed worldwide. Mesh repair is being preferred over suture repair with excellent results. Laparoscopic repair of umbilical hernia is also being performed with promising results. Good infection control with suitable antibiotics is a key factor for success of these surgeries.

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