

## Original Research Article

# The comparison of mesh and sutured repair for adult umbilical hernia: a prospective study

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## ABSTRACT

**Background:** Umbilical hernia is the commonest of all the abdominal hernias. The current study was planned to evaluate the outcome of Mayo's tension free mesh repair to sutured repair in umbilical hernias.

**Methods:** The prospective study was piloted on 110 patients who underwent umbilical hernia repair over a period of 1-year period in the department of General Surgery. The patients were divided into two groups – Group A comprises 68 patients and group 2 consists of 42 patients in which suturing, and mesh repair was done respectively. The patients were then grouped in Suture group or Mesh group as per the procedure done and 1 year follow up was done. The complications and the duration of hospital stay in both groups was recorded.

**Results:** The mean age of the subjects was  $52.8 \pm 12.1$  years. The ratio of male to female was 7:4. Seven patients (10.3%) developed recurrence following sutured repair compared to none following mesh repair ( $P < 0.05$ ). Five patients (5.3%) developed wound infection following suture repair compared to none in the mesh group ( $P < 0.05$ ). Two patients had hematoma while 1 had seroma in suture group, both haematomas occurred in patients who underwent the Mayo repair.

**Conclusions:** According to present results mesh repair is the preferred technique of manoeuvre in umbilical hernias. Mesh repair for umbilical hernias is in effect and concomitant with negligible morbidity.

**Keywords:** Mesh, Sutured repair, Umbilical hernia

## INTRODUCTION

Umbilical hernia is the commonest of all the abdominal hernias. It constitutes about 6% of all abdominal hernias in adults. The midline protrusion bordering in the umbilicus either superiorly or inferiorly are encompassed in this group and are known as paraumbilical hernias. The incidence is common in females. Obesity, multiparity and prolonged labour are the influencing factors to paraumbilical hernias.<sup>1</sup>

The perception of repair of umbilical hernia in adults is very old, but the debate is mainly regarding the selection of surgical procedure. Previously method of Mayo's

repair is commonly accomplished, but the significant recurrence rate was between 25 - 45%.<sup>2,3</sup>

Currently, prosthetic mesh is normally used to repair hernia defect. Besides this, tension free hernioplasty has now become the method of choice for repair of umbilical hernias. The inter-position of prosthetic mesh has two advantages that it reduces the tension and also eludes the excess approximation of avascular tissue and thus leads to low recurrence rate.<sup>1,4,5</sup>

The debate still exists regarding the pathophysiology of umbilical hernias in adults. They develop mostly after childhood in adult life. Umbilical hernias are mostly

indirect hernias, herniating through the umbilical canal. The boundaries of umbilical canal are formed by umbilical fascia posteriorly, linea alba anteriorly and is bounded medially by the two rectus sheaths. Thus, incarceration and strangulation are common and do not cure itself like the direct infantile umbilical hernia. The incidence of umbilical hernias is five times more frequent in females. It usually transpires after the age of 35 years. They represent around 10% of all primary hernias.<sup>6,7</sup>

In contrast to all primary hernias, there is no agreement that the repair of umbilical hernia should be mesh-based. These hernias are commonly mended by using either fascia (Mayo repair) or by a simple suture repair. Both these different types of procedures are allied with high recurrence rates (10% to 30%). Various studies suggest that recurrence rates can be lowered to 0–2% if mesh is used to repair these hernias.<sup>1,6</sup>

The current study was planned to evaluate the outcome of Mayo's tension free mesh repair to sutured repair in umbilical hernias.

## METHODS

The prospective study was piloted on 110 patients who underwent umbilical hernia repair over a period of 1-year period in the department of General Surgery. The patients were divided into two groups: Group A comprises 68 patients and group 2 consists of 42 patients in which suturing, and mesh repair was done respectively. Indications for surgery were a hernia which was painful or cosmetically intolerable. Hernia was repaired using a variety of techniques as per hospital protocol, including simple interrupted suture repair, overlapping Mayo repair, polypropylene flat mesh repair and subsequently with a mesh plug fashioned from a flat mesh (Ethicon, Belgium). The patients were then grouped in Suture group or Mesh group as per the procedure done and 1 year follow up was done. Proper history of the patient was taken, and demographic profile was recorded.

The antibiotic prophylaxis was given to all patients in the form of 1.5 g of intravenous cefuroxime at the time of surgery. The procedure was executed under general anaesthesia.

The incision for the repair of hernias were made using a 3–4 cm infra-umbilical incision. In patients enduring a sutured repair, the hernial sac was insulated and excised. The weakness was then approached using one nylon in a near and far technique in those having a simple suture repair. In patients experiencing an overlapping repair as pronounced by Mayo, the defect was approximated by interrupted mattress sutures supplemented by continuous one nylon suture along the repair. In patients undergoing a mesh repair, the hernial sac was left in situ and reduced. For defects more than 5 cm, a 6.11 cm flat polypropylene mesh was used to repair the defect. In this technique, the polypropylene mesh was placed underneath the defect in

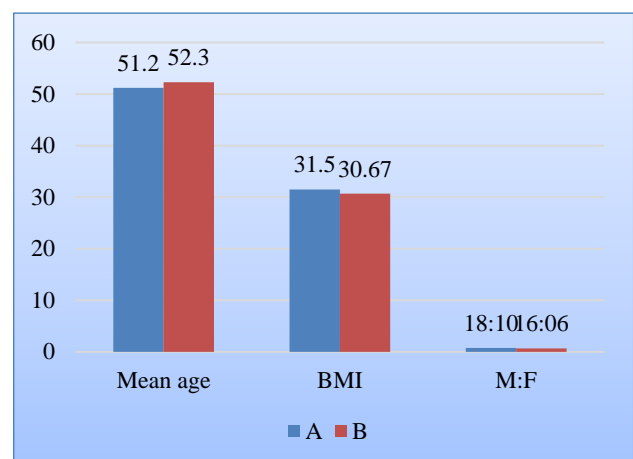
the peritoneal space with an overlap of at least 2 cm onto the adjacent tissue under the rectus sheath. The flat mesh was then affixed to the margins of the hernia defect using interrupted one nylon, with all sutures being placed prior to positioning the mesh in the peritoneal space. For defects smaller than 5 cm, a mesh plug repair was used. In this technique, a mesh plug was fashioned from a flat polypropylene mesh (6.11 cm), the shape of the mesh plug was maintained by one nylon suture placed through the mesh about 1 cm away from the apex of the mesh plug. The plug was then placed in the defect and fixed to the margins using either interrupted or continuous one nylon. A subcutaneous suction drain was used routinely except when the residual subcutaneous cavity was small. In total, 11 patients in the mesh group and 7 in the sutured group had drainage. The skin was closed with absorbable subcuticular vicryl.

The necessity for post-operative analgesia was studied. All patients were given fixed protocol of diclofenac sodium. The total number of doses required were calculated and the duration of hospital stay was recorded.

The Chi-square test was used to compare the qualitative parameters, while paired t-test was used to compare quantitative parameters between the two groups. A p-value <0.05 was considered significant. Analyses were performed using commercial software (SPSS version 21.0).

## RESULTS

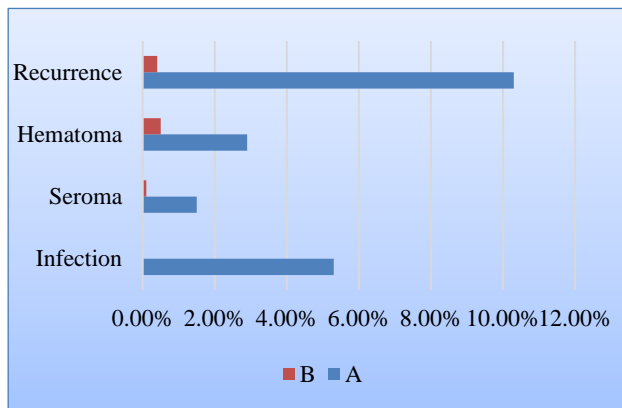
One hundred ten patients (Group A- 68, Group B- 42) were operated in the duration of study. The mean age of the subjects was  $52.8 \pm 12.1$  years. The ratio of male to female was 7:4. No statistical difference was seen between the two groups on the basis of demographic profile (Figure 1).



**Figure 1: Comparison of demographic profile between two groups.**

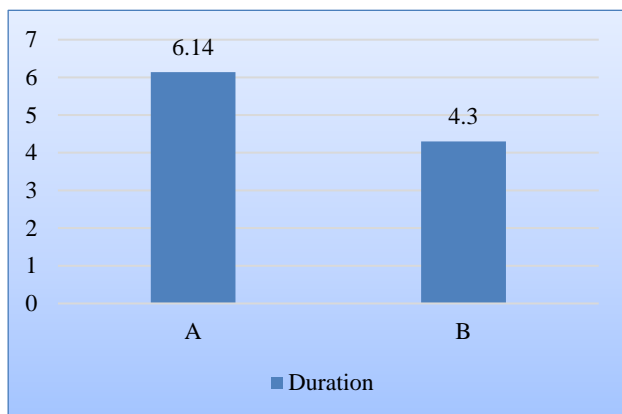
Wound complications and recurrence rate were compared in Figure 2. Seven patients (10.3%) developed recurrence

following sutured repair compared to none following mesh repair ( $P < 0.05$ ).



**Figure 2: Comparison of complications percent in the two groups.**

Group A had significantly longer period of hospital stay compared to group B ( $p < 0.05$ ) (Figure 3).



**Figure 3: Comparison of hospital stay duration (days) in both groups.**

All the recurrences were diagnosed during the first year. Four of these patients who developed recurrence following the sutured repair went on to have a mesh repair. Follow-up at a minimum of 1 year in these four patients showed no evidence of recurrence. Five patients (5.3%) developed wound infection following suture repair compared to none in the mesh group ( $P < 0.05$ ). Two patients had hematoma while 1 had seroma in suture group, both haematomas occurred in patients who underwent the Mayo repair.

## DISCUSSION

In adults, the lump through the linea alba just above or below the umbilicus is called as umbilical hernia. Previous literature suggests that these hernias are more frequent in females in comparison with males. Manzar and Soliman observed male-to-female ratio of 1:4 and 1:4.6 respectively.<sup>8,9</sup> The recent studies have focussed the

male predilection for these hernias similar to present study.

Umbilical herniation can complicate various medical abnormalities like abdominal distension, obesity, pregnancy and liver cirrhosis. Some studies have shown that after pregnancy, these hernias can revert spontaneously. Now a days, umbilical hernia is the most important complication after laparoscopic procedures.<sup>5,10,11</sup>

Mayo was the first to describe the technique of umbilical hernias repair, but high recurrence rates have been stated inspite of using different surgical techniques.<sup>3</sup> The use of mesh to repair inguinal hernias has significantly reduced the recurrence rates which is also proved by present study. Following the success of mesh repair with inguinal hernias, several authors have suggested the use of mesh to treat midline aponeurotic defects including umbilical hernias.<sup>7,12,13</sup> Recent literature has stated the use of mesh to repair umbilical hernias.<sup>5,9</sup> All these studies testified a very low recurrence rate ranging from 1% to 3%. In this study, 7 patients (10.3%) developed recurrence following sutured repair compared to only 2 patients following mesh repair ( $P < 0.05$ ). Celdran observed no recurrence in 25 cases of umbilical hernias by using technique of tension free mesh repair after follow-up of 13 months.<sup>14</sup>

The use of mesh was allied with an insignificant wound infection rate (0%), which actually was lesser than that of the sutured technique (10.3%). This variance in infection rate may be due to the fact there is very minimal tissue dissection related with the mesh plug repair as the sac is left in situ and the method is done without broadening the defect. In contrast, sutured repair needs bigger tissue dissection to expedite approximation of the defect and thus biases these patients to infective complications.<sup>15,16</sup> In present study, obese patients who developed recurrence following sutured repair and went on to have a mesh plug repair had no evidence of recurrence over a 1-year period, demonstrating the possible benefit of the mesh plug procedure in patients with a high BMI. More recently, there is increasing interest in the use of laparoscopy to repair umbilical hernias. Though these studies demonstrated lower complication and recurrence rates compared to suture and mesh repair, there is a need for randomised controlled trials to further validate those results.

## CONCLUSION

A significantly lesser rate of recurrence following mesh repair was found as compared to sutured repair. According to present results mesh repair is the preferred technique of maneuver in umbilical hernias. Mesh repair for umbilical hernias is in effect and concomitant with negligible morbidity.

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