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Umbilical Hernia: Mesh or Sutured Repair?

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ABSTRACT

Adult umbilical and paraumbilical hernia repair is associated with a high recurrence rate of 10–30%. Mesh repair has been reported to be associated with low recurrence rates. This study aims to compare sutured repair with prosthetic mesh repair to evaluate recurrence and infection rates.Present retrospective study was conducted on 110 patients who underwent umbilical andparaumbilical hernia repair over a 3-year period (Jan 2012 –Dec2014) in a tertiary care hospital. Hernia was repaired as per hospital protocol, using a variety of techniques including simple interrupted suture repair, overlapping Mayo repair, polypropylene flat mesh repair and subsequently with a mesh plug fashioned from a flat mesh. The patients were then grouped in Suture group or Mesh group as per the procedure done and 1 year follow up was maintained. Both the groups were then compared for baseline parameters, wound complications and recurrence rates using SPSS ver. 21.0.A total of 110 patients were operated upon over the study period (Mesh repair – 42, Suture repair – 68). The mean age of the subjects was 51.7 +/- 12.0 years. No difference was observed between the groups on the basis of mean age, BMI and hospital stay. Seven patients (10.3%) developed recurrence following sutured repair compared to none following mesh repair ($P < 0.05$). Significantly lower rate of recurrence was observed after mesh repair compared with sutured repair. Our results suggest that mesh repair should be the preferred choice of operation in umbilical hernias.

Key words: Mayo repair,Mesh Repair, Suture repair, Umbilical Hernia

Introduction

The pathophysiology of umbilical hernias in adults is still a matter of debate. These hernias do not persist from childhood, but arise de novo in adult life. Umbilical hernias in adults are indirect hernias, which herniate through the umbilical canal. The umbilical canal is bordered posteriorly by the umbilical fascia, anteriorly by the linea alba and medially by the two rectus sheaths. Therefore, these hernias tend to incarcerate and strangulate and do not resolve spontaneously like the direct infantile umbilical hernia [1]. Umbilical hernias are five times more common in women than men and usually occur after the age of 35 years. They are the most common type of linea alba abdominis defects in adults [1] and represent around 10% of all primary hernias [2]. However, in contrast to all other primary hernias, there is no consensus whether the repair of umbilical hernia should be mesh-based.These hernias are frequently repaired by using either an overlapping of fascia [3] (Mayo repair) or with a simple interrupted suture repair. However, these techniques are associated with high recurrence rates ranging from 10% to 30% [4–6]. Recent studies have shown that the recurrence rates can be as low as 0–2% if using mesh to repair these hernias [5–10]. The present study was thus conducted to compare our experience of suturedrepair with mesh repair for umbilical and paraumbilicalhernias.

Materials and Methods

Present retrospective study was conducted on 110 patients who underwent umbilical andparaumbilical hernia repair over a 3-year period (Jan 2012 –Dec 2014) in the General Surgery Department of NIMS Medical College & Hospital.

A total of 68 patients were in mesh group and 42 patients were in suture group. Indications for surgery were a hernia which wasuncomfortable or cosmetically unacceptable. 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 maintained. All the patients had antibiotic prophylaxis in the form of 1.5 g of intravenous cefuroxime at induction. The procedure was performed under general anaesthesia.

Surgical Technique

All the hernias were repaired using a 3–4-cm infraumbilical incision. In patients undergoing a sutured repair, the hernial sac was isolated and excised. The defect was then approximated using one nylon in a near and far technique in those having a simple suture repair. In patients undergoing an overlapping repair as described 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 preperitoneal space with an overlap of at least 2 cm onto the adjacent tissue under the rectus sheath. The flat mesh was then anchored to the margins of the hernia defect using interrupted one nylon, with all sutures being placed prior to positioning the mesh in the preperitoneal 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.

Statistical Analysis

Comparisons were made between two groups i.e. mesh repair and sutured repair group. The Chi-square test was used tocompare body mass index (BMI) and recurrence rates between the sexes, while paired t-test was used to compare recurrence and infection rates between the two groups.A p value <0.05 was considered significant. Analyses were performed using commercial software (SPSS ver. 21.0).

Results

A total of 110 patients were operated upon over this study period. The mean age of the subjects was 51.7 +/- 12.0 years. Ninety patients had paraumbilical hernias, 28 had umbilical hernias and 2 had both types of hernia. Seventy patients were male and 40 were females. Sixty eight patients had sutured repair (50 interrupted suture repair, 18 overlapping Mayo repair) and 42 had prosthetic mesh repair (35 mesh plug, 7 flat mesh). No difference was observed between the groups on the basis of mean age, BMI and hospital stay (table 1).

Wound complications and recurrence rate was compared in table 2. Seven patients (10.3%) developed recurrence following sutured repair compared to none following mesh repair ($P< 0.05$). All the recurrences were diagnosed during the first 12 months. 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. Seven patients (10.3%) 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 umbilical hernia occurs as a protrusion through the linea alba just above or below the umbilicus [10]. Historical literature review suggests these hernias are more common in females than males [11–13]. Though recent studies have shown a male predilection for these hernias [6, 14] as was evident in our study. Umbilical herniation can complicate abdominal distension, obesity, pregnancy and cirrhosis [11]. After pregnancy, these hernias can regress spontaneously. More recently, it has been reported as a complication following laparoscopic procedures [15]. Since Mayo first described his technique to repair umbilical hernias, high recurrence rates have been reported despite using various surgical techniques [16]. The use of mesh to repair inguinal hernias has significantly reduced the recurrence rates [17]. 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 [16]. In recent years, various studies have described the use of mesh to repair umbilical hernias [5–10]. All these studies reported a very low recurrence rate ranging from 0% to 2%. In the present study, 7 patients (10.3%) developed recurrence following sutured repair compared to none (0%) following mesh repair (P< 0.05).The use of mesh was associated with a negligible wound infection rate (0%), which in fact was lower than that of the sutured technique (10.3%). This difference in infection rate may be due to the fact there is very minimal tissue dissection associated with the mesh plug repair as the sac is left in situ and the procedure is done without enlarging the defect. In contrast, sutured repair requires greater tissue dissection to facilitate approximation of the defect and possibly predisposes these patients to infective complications. 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 [14, 18, 19]. 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

We found a significantly lower rate of recurrence after mesh repair compared with sutured repair. Our results suggest that mesh repair should be the preferred choice of operation in umbilical hernias. Mesh repair for umbilical hernias is effective and associated with minimal morbidity.

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TABLES

Table 1. Comparison of Quantitative parameters between groups

Variables	Group		p- value
	Suture (n-68)	Mesh (n-42)	
Mean Age (years)	51.2 ± 12.1	52.3 ± 11.9	0.33
BMI (Kg/m2)	31.5 ± 4.6	30.67 ± 4.1	0.42
Male: Female ratio	18:10	16:6	< 0.01
Hospital stay (days)	1.53 ± 0.7	1.79 ± 0.69	0.78

Table 2. Comparison of Complications between groups

Complications	Group				p- value
	Suture (n-68)		Mesh (n-42)		
Infection	7	10.3%	0	0.0%	< 0.05
Seroma	1	1.5%	0	0.0%	0.52
Hematoma	2	2.9%	0	0.0%	1.0
Recurrence	7	10.3%	0	0.0%	< 0.05