



A PROSPECTIVE COMPARATIVE STUDY ON ONLAY MESH REPAIR VERSUS MAYO REPAIR FOR PARAUMBILICAL HERNIA AND THEIR POSTOPERATIVE COMPLICATIONS

General Surgery

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ABSTRACT

Paraumbilical hernia is a type of ventral hernia occurring through Linea Alba either superior or inferior to the umbilicus. The sac of the hernia may contain preperitoneal fat, omentum, or small intestine. Open techniques of repair include conventional anatomical (Mayo's) repair and mesh (Onlay) hernioplasty. Objectives of this study were to compare among the techniques. This is a comparative, prospective study of 60 cases of paraumbilical hernia presented out of which 30 were treated with mayo's repair and 30 with mesh hernioplasty, during a period of January 2023 to July 2024. Paraumbilical hernia was found more commonly between 4th and 6th decade of life predominantly in females. Percentage of early postoperative complications and recurrence in mayos repair was more than Onlay mesh hernioplasty. Mesh repair is a technique with good post-operative outcome, low recurrent rate.

KEYWORDS

Paraumbilical hernia, Onlay mesh, Mayo's repair

INTRODUCTION

Umbilical and paraumbilical hernias are prevalent in the adult population, representing 10–14% of all hernias^{1,2}. A paraumbilical hernia is a specific type of ventral hernia that develops through the Linea Alba, either above or below the umbilicus. These hernias are particularly common in women, with an incidence ratio of 3:1, especially among those who are parous, obese, middle-aged, or elderly³. Typically, paraumbilical hernias result from acquired defects in the abdominal wall, often due to weakened periumbilical fascia and factors that contribute to elevated intra-abdominal pressure. The hernia sac usually contains preperitoneal fat, omentum, or small intestine, and occasionally a combination of these structures⁴.

To prevent complications, surgical intervention is often necessary. Historically, the Mayo's anatomical repair technique was the standard before mesh became widely used. Mesh can be applied through both open and laparoscopic methods, with some experts suggesting laparoscopy is preferred in about 25% of cases⁵⁻⁶. Open techniques for mesh placement include onlay, inlay, sublay, and underlay⁷, with onlay being the simplest and most time-efficient option⁸⁻¹⁰.

Aims And Objectives : A comparative analysis of both surgical treatment modalities [i.e. conventional Mayo's surgery and Onlay Mesh hernioplasty] and its efficacy in Paraumbilical hernias and to compare post-operative complications for above mentioned surgeries.

MATERIAL AND METHODS :

A prospective comparative Hospital based study done on 60 cases of patients meeting inclusion and exclusion criteria of paraumbilical hernia undergoing admission in general surgery wards, in JLN Medical College & Hospitals, Ajmer.

Inclusion Criteria: Patients of age group 18-70 years of para umbilical hernia, and who had hernia of small and medium size; 2-6 cm diameter.

Exclusion Criteria: Patients aged below 18 years and above 70 years, uncontrolled hypertension, diabetes mellitus and cirrhosis of liver, ascites and carcinoma, with immunodeficiency, collagen vascular diseases and having large and recurrent hernia.

Group A (n=30) patients who were operated by using conventional open suture technique (Mayo's Repair)

Group B (n=30) patients who were operated by using Onlay mesh technique.

Both techniques were compared based on following complications - pain, hematoma, seroma, wound infection, mesh extrusion,

recurrences (based on 6 months follow up)

Methodology :

Mayo's Repair

The patient was positioned supine under anesthesia, and the surgical site was prepared with appropriate draping. A transverse elliptical incision was made around the umbilicus, extending about 5 cm laterally on either side of the hernia. This incision was deepened through the subcutaneous fat until the aponeurosis was exposed. The neck of the hernia sac, typically free of adhesions, was the first area accessed. Surrounding connective tissue was cleared to expose the neck of the hernia as it emerged through the linea alba. A small incision was made in the fibrous covering of the neck and carefully deepened to open the sac. A finger was used to check for adhesions within the sac while the remaining neck was divided with scissors, ensuring the contents were protected. The central portion of the hernia sac, along with attached skin and fat, was examined while still connected to the abdomen. The redundant sac was ligated and excised, carefully reduced back into abdomen. The opening was widened on both sides for better tissue overlap, and deep sutures were placed for closure.

Non-absorbable polypropylene material was used for suturing. A round body needle was utilized to insert the suture about 3 to 4 cm from the edge of the upper flap. The needle was then passed across the defect into the lower flap, 1 to 2 cm from its margin. This process was repeated to secure all sutures. The upper flap was folded over the lower flap, and the sutures were tied tightly using a triple-layer, double-throw knot. The suture ends were trimmed, and a suction drain was placed over the repaired area. Closure was performed in layers, with the skin sutured using ethilon.

Mesh Repair

For the mesh repair, polypropylene mesh, typically measuring 6" x 3", was used, with larger sizes for bigger defects. After addressing the hernia sac as mentioned above, the aponeurosis was approximated using polypropylene sutures in interrupted fashion. The prosthetic mesh was then placed over the aponeurosis and secured with additional polypropylene sutures. A suction drain was inserted, and the subcutaneous tissue and skin were sutured closed

Statistical Analysis:

Data were expressed as mean±SD for quantitative variable, number and percentage for descriptive variables. Chi square and t test were used when appropriate. P<0.05 was statistically significant.

Investigations:

All investigations relevant with pre anaesthetic check up along with abdominal USG was performed.

RESULTS :**Table 1 : Sex Distribution Of Subjects**

Sex	Group A (Mayo's Repair)		Group B (Onlay Mesh Hernioplasty)		Total		Chi Square	P value
	Number	Percent	Number	Percent	Number	Percent		
Male	15	50.00	11	36.67	26	43.33	1.086	0.29376 (S)
Female	15	50.00	19	63.33	34	56.67		
Total	30	100.00	30	100.00	60	100.00		

Table 2 : Mean Values

	Group A (Mayo's Repair) (n=30)		Group B (Onlay Mesh Hernioplasty) (n=30)		Chi Square	P Value
	Mean	SD	Mean	SD		
Duration of Surgery (min.)	45.33	± 8.40	51.33	± 6.44	17.33	0.000172 (S)
Duration of Hospital Stay (Days)	4.53	± 1.07	5.20	± 0.76	2.7960	0.0070 (S)

Table 3 : Complications Distribution Of Subjects

Complications	Group A (Mayo's Repair)		Group B (Onlay Mesh Hernioplasty)		P Value
	Number	Percent	Number	Percent	
Pain	15	50.00	6	20.00	0.049 (S)
Hematoma	2	6.67	0	0.00	-
Seroma	2	6.67	5	16.67	0.2568 (NS)
Wound infection	1	3.33	2	6.67	0.56 (NS)
Mesh Extrusion	0	0.00	2	6.67	-
Recurrences	2	6.67	0	0.00	-

DISCUSSION

- In the present study in mayo's group 15 (50%) females and 15 (50%) males. In mesh group 11 (36.67%) males and 19 (63.33%) females. 30 patients underwent polypropylene onlay mesh repair and 30 patients underwent Mayo's repair. In this series, most common postoperative complications were (i) Pain 50% in Mayo's repair and 20% in Mesh repair. Seroma 6.67% in Mayo's repair, 16.67% in Mesh repair (ii) Wound infection 3.33% in Mayo's repair, 6.67% in Mesh repair. There was 2 recurrence (6.67%) in cases of Mayo's repair. There were no recurrences in Mesh repair.
- In the study of Naik SC et al (2018)¹¹ in mayo's group (n=30), 18 (60%) female and 12 (40%) were male and in mesh group (n=30), 21 (70%) were female and 09 (30%) were male. Most common postoperative complications were (i) Seroma 13.3% in Mayo's repair, 6.6% in Mesh repair (ii) Wound infection 6.6% in Mayo's repair, 3.3% in Mesh repair (iii) There was one recurrence (3.33%) in cases of Mayo's repair. There were no recurrences in Mesh repair.
- In the study of Shameen PMM et al. (2019)¹² pain was complained in the post-operative period in 19/29 (65.51%) patients in Group A and 16/29 (55.17%) patients in Group B. Hematoma was observed in 5/29 (17.24%) patients in Group A and 7/29 (24.13%) patients in Group B. Seroma was observed in 4/29 (13.79%) patients in Group A and 3/29 (10.34%) patients in Group B.
- In the study of Garg C et al. (2023)¹³ 65.3% were females and 34.7% were males, Raghuwanshi S et al. (2022)¹⁴ 52% were females and 48% were males. In the present study there were 56.67% were females and 43.33% were males. In the study of Anjum S et al. (2012)¹⁵ mean hospital stay was 6 days in Group A (Mayo) while that of Group B (Onlay) was 9 days. In the study of Sadiq F et al. (2013)¹⁶ mean hospital stay was 2-3 days in Group A (Mayo) while that of Group B (Onlay) was 3-4 days. Similarly, in the present study, Group A (Mayo) mean hospital stay was 4.5 days and Group B (Onlay) was 5.2 days.
- In the study of Anjum S et al. (2012)¹⁵ mean duration of surgery in Group A (Mayo) was 1 hour while that of Group B (Onlay) was 1 hour 30 minutes. Similarly in the present study, mean duration of surgery in Group A (Mayo) was 45.33±8.40 minutes while that in Group B (Onlay) was 51.33±6.44 minutes.

CONCLUSION

Both methods had similar gender distributions, the Mayo group

experienced more pain and seromas were more frequent in the mesh group. Importantly, the mesh repair had no recurrences, unlike the Mayo group, which had a 6.67% recurrence rate. These findings suggest that onlay mesh repair may offer benefits in recurrence rates and specific complications, warranting further research into long-term outcomes.

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