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Original Research Article

A HOSPITAL BASED PROSPECTIVE STUDY TO COMPARE THE ETIOLOGY, RISK FACTORS, OUTCOME AND POSTOPERATIVE COMPLICATIONS IN ANATOMICAL REPAIR (MAYO'S) & MESH REPAIR IN UMBILICAL AND PARAUMBLICAL HERNIA AT TERTIARY CARE CENTER

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ABSTRACT

Background: Paraumbilical hernias pose significant health risks if left untreated, particularly in populations with high prevalence rates due to risk factors such as obesity and multiparity. Surgical repair is the standard treatment, with options including Mayo repair and mesh repair. This study makes an attempt to evaluate the incidence, clinical features, operative techniques and postoperative outcomes like recurrence and complications. It compares the modern technique of prosthetic mesh repair and suture repair of umbilical and paraumbilical hernias.

Materials & Methods: This is a hospital based randomized controlled trial. 40 patients of umbilical and Paraumbilical hernia admitted in department of General Surgery, AIMS, Rajsamand, Rajasthan during one-year period. Surgical procedures done were Mayo's repair and Prosthetic mesh repair. Twenty patients were selected for particular procedure randomly. Patients who underwent Mayo's repair and 20 patients who underwent polypropylene mesh repair.

Results: In this current series of 40 patients the majority of the patients belong to the age group 21-40 years of age. The major proportion of cases was women 67.5%. Age distribution in Mesh is 42.28±14.56 years; age distribution in mayo's is 40.85±11.99 years. The commonest mode of presentation was with pain and swelling at the umbilical region. The main complaints in 15% of the patient were pain and tightness of the abdominal wall which was more in Mayo's repair. Our study showed that there was no recurrence with mesh repair but 1 case had recurrence out of 20 Mayo's repair (after 11 months).

Conclusion: Prosthetic mesh repair is a technique with good postoperative outcome, low recurrent rate and excellent patient satisfaction. It could become the gold standard in adult umbilical and paraumbilical hernia repair, in the future.

Keywords: Paraumbilical Hernia, Umbilical Hernia, Mayo's Repair, Mesh Repair, Recurrence.

INTRODUCTION

Umbilical hernias have been documented throughout history with the first references dating back to the ancient Egyptians with the first known record of a surgical repair by Celsius in the first century AD. During the different periods of history

people have successfully and unsuccessfully treated umbilical hernias.[1] Umbilical hernia has gained little attention from surgeons in comparison with other types of abdominal wall hernias (inguinal, postoperative); however, the primary suture for umbilical hernia is associated with a recurrence rate of 19–54%. The umbilical hernia is a common surgical problem mainly encountered in the 5th and 6th decades of life. Umbilical hernia is a protrusion of a viscous or part of a viscous through the umbilical cicatrix. Paraumbilical hernia is an uncharacteristic protrusion of abdominal contents that pushes through the abdominal wall surrounding the umbilicus.[2] Strenuous activities usually cause the bulge to appear around the umbilicus.[3]

The umbilicus is the scar that marks the connection between the foetus and placenta. It lies at a variable point in the midline depending on patient habitus, in the linea alba. A hernia is an abnormal protrusion of a viscus, or part of a viscus through a congenital or acquired defect.

In adults, most umbilical hernias are in fact para-umbilical, with the defect arising just above or below the cicatrix. It is more common for hernias to occur just above the umbilicus, where the tissue consists of a thin layer of transversalis fascia. Inferiorly, there is slightly more reinforcement in the form of the obliterated umbilical vessels.[4]

They can present in either the elective or emergency setting and the treatment can differ in each case. Symptoms of umbilical hernia include a noticeable bulge around the umbilicus which is more prominent on standing and may disappear on lying down; pain; obstruction. Signs range from a reducible lump with a positive cough impulse to the emergency presentation of an unstable, obstructed patient.[5] Painful, reducible hernias and strangulated, painful, irreducible hernias although less incidence should be treated with early surgery.

Although most para-umbilical hernias contain omentum only, in the emergency setting, with an obstructed patient, one should be prepared to find incarcerated and potentially ischaemic bowel and perform a full laparotomy with bowel resection if necessary. Although umbilical hernias are amongst the commonly occurring abdominal wall defects, not much work has been done to record the incidence. Western studies quote an incidence 4.65% among all types of hernias.[4,5]

This study makes an attempt to evaluate the incidence, clinical features, operative techniques and postoperative outcomes like recurrence and complications. It compares the modern technique of prosthetic mesh repair and suture repair of umbilical and paraumbilical hernias.

MATERIALS AND METHODS

This is a hospital based randomized controlled trial. 40 patients of umbilical and Paraumbilical hernia admitted in department of General Surgery, Ananta Institute of Medical Sciences, Nathdwara, Rajsamand, Rajasthan, India who were willing to be part of this study were registered and parameters such as height, weight, number of pregnancies, and other illness were recorded.

The study criteria include, randomly selected 40 paraumbilical hernia patients and excludes Patient with severe co-morbid conditions (severe cardiopulmonary disease, uncontrolled ascites), recurrent hernia, pediatric patients and patients undergoing emergency surgery are excluded.

Clinical history regarding duration of hernia, progression, associated complaints like pain in the swelling or abdomen, vomiting, reducibility, chronic cough, constipation, difficulty in micturition, abdominal distension-history suggestive of ascites and other causes of abdominal distension, number of pregnancies, previous surgery for same problem is collected. In local examination special attention was given to the position, size, shape, composition, cough impulse, reducibility, skin over the swelling and size of defect in linea alba.

Pre-surgical technique

Cases were prepared for surgery after preoperative correction of anemia, hypertension, diabetes and local skin conditions. All patients underwent surgical procedure after preoperative preparation. All patients received one dose of preoperative antibiotic 1gm of 3 rd generation cephalosporin during or immediately after induction of anaesthesia. The anaesthesia of choice was sub arachnoid block or epidural anaesthesia with mild intravenous sedation. On operative table betadine scrub given to anterior abdominal wall. Surgical procedures done were Mayo's repair and Prosthetic mesh repair. Twenty patients were selected for particular procedure randomly. Patients who underwent Mayo's repair and 20 patients who underwent polypropylene mesh repair.

Surgical technique

Mayo's repair

After anaesthesia patient is laid on supine position, parts painted, and drapes are applied to allow access to the umbilical area. A transverse elliptical incision is made enclosing the umbilicus and the skin covering the hernia. It should extend laterally on each side for at least 5cm beyond the protuberance. It is deepened through subcutaneous fat until the glistening surface of the aponeurosis is exposed. The neck of the sac is generally free from adhesions and is opened first. Before doing so, the aponeurosis is cleared centrally from all directions, until the neck of the hernia is exposed of the level where it emerges through linea Alba. A small incision is made in the fibrous coverings of the neck of any convenient point on its circumference and is carefully deepened until the sac itself has been opened. A finger is introduced and is passed round the inside of the sac to determine the presence of any adhesions. The remaining circumference of the neck of the sac is then divided with scissors, the finger being used to protect the contents from injury.

The central island comprising the sac together with attached ellipse of skin and fat is now joined to the abdomen only by contents is carefully examined. If they consist of omentum, which is ischaemic, it can be ligated and excised, if it is healthy, it can be reduced into peritoneal cavity. If bowel is the content, sac is opened up as far as possible. The sac is now gradually turned inside out, and contents gently peeled off its interior. Adherent omentum removed along with the sac. Adhesions between adjacent coils of intestine are released as far as possible and the hernial contents are returned to the abdominal cavity.

Figure 1: Surgical techniques

Mesh repair

Steps for surgery are similar to Mayo's repair till the hernial sac and its contents are managed. Polypropylene mesh is used for repair. Most commonly used size of mesh is 6" x 3". If defect is larger, larger sized mesh is used.

After exposing the defect and excising excess part of hernial sac, peritoneum is closed using vicry 2-0, mesh is placed beneath the peritoneum. It is fixed to rectus sheath using prolene suture. Incision closed after keeping suction drain. In all patient suction drain was kept (No. 16) and skin closed with skin staplers or ethilon.

RESULTS

In this current series of 40 patients the majority of the patients belong to the age group 21-40 years of age. The number of patients decreases at higher ages. Females presented at early age. The mean age for paraumbilical hernia was 43.5 years and 40.6 years for umbilical hernia. The major proportion of cases was women 67.5%. Most of the women affected were corpulent women with 2 or more pregnancies. There is no difference in age distribution of cases between males and females. Age distribution in Mesh is 42.28±14.56 years; age distribution in mayo's is 40.85±11.99 years. The commonest mode of presentation was with pain and swelling at the umbilical region. The next commonest presentation was swelling. The mean BMI was 23.59 kg/m2 (range18-33) and majority of the patients were female. [Table 1]

The main complaints in 15% of the patient were pain and tightness of the abdominal wall which was more in Mayo's repair. 1 patients with mesh and 2 patients with Mayo's repair had wound infection; one patient had wound infection and dehiscence. However, it was treated with antibiotics and did not require mesh removal. [Table 2]

Of the 40 patient operated 20 patients had polypropylene mesh repair and 20 had Mayo's repair. Patient with larger defects underwent mesh repair. The commonest content of hernia sac was omentum (25, 62.5%). Fourteen patients 35% had small intestines and omentum together. The rest had large intestine and omentum together. [Table 3]

Our study showed that there was no recurrence with mesh repair but 1 case had recurrence out of 20 Mayo's repair (after 11 months). [Table 4]

Table 1: Demographic and clinical profile of patients

	Mesh repair (N=20)	Mayos repair (N=20)	Total (N=40)
Gender			
Female	13(65%)	14(70%)	27 (67.5%)
Male	7(35%)	6 (30%)	13(32.5%)
Age (yrs)			
Mean age	42.28±14.56	40.85±11.99	41.72±13.18
Duration of the hernia			
1-3 months	3 (15%)	1(5%)	4(10%)
4-6 months	3(15%)	7(35%)	10(25%)
7-12 months	10 (50%)	8(40%)	18(45%)
1-2 years	1(5%)	5(25%)	6(15%)
>2 years	2(10%)	0(0%)	2(20%)
BMI (Kg/m2)			
Mean±SD	24.21±3.40	22.77±3.28	23.59±3.40

Table 2: Postoperative Complaints/Complications

Complications		Mayo'srepair	Mesh repair	Total
Pain	Count	4	2	6
Wound infection	Count	2	1	3
Wound infection/ Wound dehiscence	Count	0	1	1
Total	Count	6	4	10

Table 3: Operative technique and contents of sac

Content of Sac	Mayo'srepair	Mesh repair	Total
Colon	1(5%)	0 (0%)	1(2.5%)
Omentun	12(60%)	13(65%)	25(62.5%)
Small intestine	7 (35%)	7 (35%)	14 (35%)
Total	20(100%)	20(100%)	40(100%)

Table 4: Recurrences

Recurrence	Mesh repair	Mayos repair	Total
Nil	20(100%)	19 (95%)	39(97.5%)
Recurrence (16 month)	0(0%)	1 (5%)	1(2.5%)
Total	20(100%)	20(100%)	40(100%)

P>0.05

DISCUSSION

Paraumbilical hernias constitute one of the common hernias of adulthood. Formation of Paraumbilical hernia is a multifactorial and complex process they are most commonly found along the midline linea Alba. Though they are typically supraumbilical in location. Repair of paraumbilical hernia was earlier performed by Mayo's repair, but it has high recurrence rate upto 28% to30%.[6] Thus it has been replaced with Mesh repair as standard procedure for paraumbilical hernia repair, it has low recurrence rate compared to Mayo's repair. Umbilical hernias are amongst the common abdominal wall defects, not much work has been done to record the incidence. Western studies quote an incidence 4.65% among all types of hernias.[4] the management of paraumbilical hernias remains one of the common surgical problems.[7] a number of operations are presently employed in the management of paraumbilical hernia.

The results of your study demonstrate that paraumbilical hernia is more prevalent in females compared to males. This finding aligns with previous studies that have reported a higher incidence of paraumbilical hernia in these age groups due to factors such as multiparity, obesity, aging, and lifestyle habits such as smoking.[8-12]

This increase incidence in females may be due to the higher mean BMI observed in females and the stress of the labour which is moreover substantiated by the fact that females were affected at a younger age and males much later.

In majority of cases the main presenting symptom was swelling and pain at the umbilical region. As stated in Nyhus and Codon.[13] Hernia, this is due to the dragging of the omentum and constriction by the fibrous ring at the neck of the sac.

The operative techniques employed were Mayo's anatomical repair and prosthetic mesh repair. Of the 20 Mayo's repairs done there was 1 recurrence but none seen with mesh repair. The percentage recurrence was 5%. Although this difference was not statistically significant. This finding suggests that mesh repair may be more effective in preventing recurrence, which is consistent with previous literature.[12]

According to local statistics, umbilical hernia accounts for about 12% of all hernias in adults. Its repair by the trendy onlay flat mesh is simple, safe and effective with acceptable recurrence rate and a short learning curve. The classical modified Mayo's overlap is less costly and easier to perform. It is reported to have a higher recurrence potential (40% by Halm in 2005).[14]

CONCLUSION

Prosthetic mesh repair is a technique with good postoperative outcome, low recurrent rate and excellent patient satisfaction. It could become the gold standard in adult umbilical and paraumbilical hernia repair, in the future.

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