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A clinical study of adults' paraumbilical hernia and its treatment

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Abstract

Background and Objectives: The paraumbilical hernia is among the most typical adult hernia forms. This clinical study examines the appearance, etiology, management, and postoperative outcomes of persons with paraumbilical hernias.

Methods: From August 2017 to July 2018, the study was done at Department of General Surgery, Sree Lakshmi Narayana Institute of Medical Sciences, Puducherry, India. 47 situations have been looked at Nine people had Vertical Anatomical Repair, 18 people had Open Prosthetic Mesh Repair, and 19 people had Laparoscopic Mesh Repair.

Results: 19 patients (40.4%) underwent Laparoscopic prosthetic mesh repair and 18 patients (38.2%) underwent open prosthetic mesh repair out of which 3 were inlay mesh repair, 10 were On lay and 7 was pro peritoneal mesh repair. 9 patients underwent vertical anatomical repair. Table 7 shows surgical procedures. There is a statistical difference between Open and Laparoscopic Mesh repair in the length of time spent in the hospital after surgery (T=3.232, P=0.0026) and the pain score (p0.05). Open mesh repair, anatomical repair, and laparoscopic mesh repair do not cause the disease to come back.

Conclusion: Surgery is the treatment of choice in all cases. The classic repair is that proposed by Mayo. In healthy individuals surgical repair with better non absorbable suture material given good results with a low recurrence rate.

Keywords: Paraumbilical hernia, obesity, prosthetic mesh repair, laparoscopic mesh repair

Introduction

An irregular protrusion of a viscus or portion of a viscus through an irregular opening in the walls of its enclosing cavity is known as a hernia [1]. The protrusion of the abdominal contents through a weak point in the abdominal wall is known as an external abdominal hernia. Umbilical hernias refer to any hernia that seems to be closely associated with the umbilicus. This type of ventral midline hernia, known as a paraumbilical herniae, is one of the adult-onset forms that are located either above the umbilicus (supraumbilical) or sporadically below the umbilicus (infra umbilical). The most common type of acquired umbilical hernia is paraumbilical hernia [2]. The central hole in the linea Alba is called the umbilicus. The newborn has an umbilical defect when they are born, but it closes within a week or so as the umbilical cord stump heals. This process can be delayed down, which increases the risk of hernias in premature babies and affects up to 10% of newborns. Adults with conditions such as pregnancy, obesity, or liver disease with cirrhosis that cause the midline raphe (also known as the linea Alba) to stretch and thin are more prone to experience a reopening of the umbilical defect. Adjacent to the actual umbilicus is the opening in the middle of the raphe. The phrase "paraumbilical hernia" is frequently used [3, 4]. In minor umbilical hernias, omentum, or extraperitoneal fat, is frequently detected. Larger hernias can encase the entire small or large intestine, yet even at their largest, the sac's neck is still rather modest in relation to the volume it can contain. As a result, adult bowel-related umbilical hernias frequently result in strangulation, are unfixable, or both [4].

Although the frequency of adult onset umbilical hernias is unknown, most occurrences are believed to be acquired rather than congenital. With a 3:1 ratio of women to men, it occurs more frequently in adult women than in men. Pregnancy, obesity, ascites, peritoneal dialysis, and chronic or recurrent abdominal distension from bowel blockage are among the conditions that frequently result in umbilical hernias [5]. A weak or incomplete umbilical scar and increased abdominal pressure are two possible contributing factors to an adult's umbilical hernia [6].

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Now that it has been demonstrated that overlapping fascial closures in hernia repair diminish the overall wound strength, the conventional "vest-over-pants" approach, developed by Mayo, is utilized less frequently [7, 8]. Adults with minor non-symptomatic umbilical hernias should receive clinical care. If a hernia is observed to be getting larger, if it hurts, or if it becomes stuck, surgery is recommended. Primary sutures or prosthetic mesh, which can be implanted via open or laparoscopic surgery, can be used to close larger holes (> 2 cm) [8]. Extra attention is required for patients with an umbilical hernia, ascites, or severe liver disease. If ascites is left untreated, the protuberant hernia's surrounding skin may deteriorate and eventually leak, increasing the patient's risk of developing bacterial peritonitis. It is advisable to postpone umbilical hernia repair until the ascites has been controlled [9].

This study examining risk factors and treatment options for paraumbilical hernias is an excellent idea because paraumbilical hernias can be painful and ugly, and women are more likely than males to acquire them (3 to 1). The frequency of paraumbilical hernias in people admitted to Nizams Institute of Medical Sciences is examined in this study [10, 11]. It also examines their post-operative healing, surgical procedures, risk factors, and symptoms.

Methodology

All of the information for this study came from paraumbilical hernia patients who were treated at Department of General Surgery, Sree Lakshmi Narayana Institute of Medical Sciences, Puducherry, India from August 2017 to July 2018.

Inclusion criteria

All patients above the age of 18 admitted with paraumbilical hernia (obstructed/ strangulated/complicated).

Exclusion criteria

All patients below 18 years

A Proforma was created and used for the investigation. When gathering clinical data, the following factors were crucial. The clinical history is obtained, covering the duration of the hernia, its size, and any associated symptoms such as abdominal or swollen discomfort, vomiting, reducibility, persistent cough, constipation, and difficulty peeing. The number of pregnancies and any prior surgery for the same issue are also recorded if there is abdominal distension. Position, size, form, cough impulse, ability to shrink, skin over swelling, size of hole in the linea alba, and tone of abdominal muscles were all observed closely during the local exam [12].

Obesity, hypertension, the reason for an enlarged abdomen, benign prostatic enlargement, a per-rectal exam to check for a malignant mass in the rectum, an exam to check for external meatal stenosis, and an exam to check for a tight urethra in men were all addressed during a standard physical examination. Check for respiratory symptoms such as rhonchi and crepitations, which may indicate COPD. If the patient had previously received a diabetes diagnosis and was receiving treatment, or if their blood sugar level was higher than normal, tests for the condition were performed (FBS 70-110 mg/dl, PPBS Blood urea, serum creatinine, urine for albumin, sugar, and microscopy, ECG, chest X-ray). All patients did not require additional testing, with the exception of those who required an abdominal ultrasound due to ascites [13].

Cases were ready for surgery after high blood pressure and diabetes were fixed before surgery. All of the patients had surgery after taking the following steps to prepare for it:

- Informed written consent was obtained after explaining the surgical procedure and its results.
- Nil by mouth after 10:00 pm on the previous night of surgery.
- Injection tetanus toxoid 0.5 ml IM.
- Injection xylocaine test dose.
- Preparation of the parts by shaving.

Prior to surgery, each patient received a single dosage of 1 gram of third-generation cephalosporins as an antibiotic. During the procedure, open prosthetic mesh repair (inlay, onlay, properitoneal), laparoscopic mesh repair, and vertical anatomical closure were all carried out.

The patient could choose whether to have an open or laparoscopic surgery-17.

- Patients underwent Vertical anatomical repair-9.
- Patients underwent Open prosthetic mesh repair repair-19.
- Patients underwent Laparoscopic mesh repair-19

Statistical Methods

The Fisher Exact and Chi square tests have been used to determine the significance of the frequency of postoperative complications and pain in various scenarios. The average number of days it takes to return to regular life after surgery and the average amount of time spent in the hospital following surgery have been tested using the Student t test and Mann Whitney U test [14].

Statistical software

SPPS 10.0 and Systat 8.0, two statistical programmes, were used to look at the data, and Microsoft Word and Excel were used to make graphs, tables, and other things.

Results

Study Design

An investigation on the causes, clinical manifestations, and risk factors of paraumbilical hernia, as well as treatment options, was conducted on a prospective sample of 47 patients with paraumbilical hernia. The study also examined morbidity and post-operative complications. Table 1 displays the Paraumbilical Hernia Incidence.

Table 1: Incidence of Paraumbilical Hernia

	Number	Incidence Rate in Percentage %
Total number of admissions from August 2017 to July 2018	4,632	-
Total hernias operated	550	-
Inguinal hernia	350	63.6
Incisional hernia	110	20
Paraumbilical hernia	47	8.5
Epigastric hernia	40	7.2
Femoral hernia	03	0.5

Table 2: Age distribution of Paraumbilical Hernia

Age in years	Number	Percentage %
19-29	1	2.1
30-39	13	27.6
40-49	18	38.2
50-59	11	23.4
>60	4	8.5

This table shows that most patients are between 30 and 50 years old. Only 4 of the patients were older than 60. The youngest

person in this group was 14, and the oldest person was 29. Table 2 shows Age distribution of Paraumbilical Hernia.

Table 3: Sex Distribution of Paraumbilical Hernia cases

Sex	Number	Percentage	Mean age with SD
Male	12	25.5	23.06±8.6
Female	35	74.4	37.45±7.5
Inference	There is no statistical difference of age distribution between male and female.		

According to this table, 12 patients (25.5%) and 35 patients (74.4%) were male. The mean age distribution for males is 23.06±8.6, while for females it is 37.45±7.5. Table 3 displays the gender distribution of instances of paraumbilical hernia.

Table 4: Presentation of Symptoms

Symptoms	Number	Percentages
Swelling around Umbilicus	47	100
Pain in the Swelling or Pain Abdomen	15	31.9
Symptoms Suggestive of Intestinal Obstruction	1	2.1

In our study most common symptom that patient presented with was swelling around the umbilicus. 31.9% of patients had associated pain in the swelling or dragging type of pain in the abdomen. 1 patient had symptoms of intestinal obstruction. Table 4 shows Presentation of Symptoms

Table 5: Duration of Swelling

Duration	Number	Percentage
Since childhood	2	4.2
0-5 months	6	12.7
6-11 months	10	21.2
1-3 yrs	25	53.1
3-6 yrs	2	4.2
6-10 yrs	1	2.1
More than 10 yrs	1	2.1

This table shows that 53.1% of patients had swelling around the umbilicus for 1-3 years before presenting to hospital. 21.2% of patients had swelling for 6-11 months; 12.7% of patients had swelling 0-5 month. Table 5 shows Duration of Swelling.

Table 6: Size of the Defect

Size of the defect	Number (n=47)	Percentage
< 4.0 cm	31	65.9
4.0-6.0 cm	14	29.7
> 6.0 cm	2	4.2

This table shows that size of the defect was < 4 cm in 31 patients (65.9%), between 4-6 cm in 14 patients (29.7%) and > 6 cm in 2 patients (4.2%). Table 6 shows Size of the Defect.

Table 7: Surgical procedures

Procedures	Number (n=47)	Percentage
Vertical Anatomical Repair	9	19.1
Open Mesh Repair	18	38.2
In Lay	3	6.3
On Lay	10	52.6
Pro peritoneal	7	36.8
Laparoscopic Mesh Repair	19	40.4

Nineteen patients (40.4%) in our study had laparoscopic prosthetic mesh repair, and eighteen patients (38.1%) had open

prosthetic mesh repair, of which three were for inlay mesh, ten were for on lay, and seven were for pro peritoneal mesh. Anatomical repair was performed vertically on nine patients. Table 7 lists surgical techniques.

Discussion

The same patient groups' incidence, clinical characteristics, course of treatment, and postoperative complications were examined during the study period. Since they comprise the majority of the sample, open mesh repair and laparoscopic mesh repair are the primary subjects of discussion [15]. In our hospital, the incidence of inguinal hernias is 63.6% that of incisional hernias is 20% that of paraumbilical hernias is 8.5%, that of epigastric hernias is 7.2%, and that of femoral hernias is 0.5%. The age range of 65.8% of patients with paraumbilical hernias in our study was between 30 and 50 years old. Children's patients have been removed from the trial. The age range of the participants in our study with paraumbilical hernias was 26 for the youngest and 66 for the oldest. A paraumbilical hernia is more common in women [16]. Thirty-four women and thirteen males were in the hospital. According to our research, the ratio of female to male characters in books is 3:11. 2.13:1. Because most diseases strike both men and women between the ages of 30 and 50, there isn't much of a difference in how old men and women are. The primary symptom of all 47 patients upon admission to the hospital was edema surrounding the abdominal button [17]. Of those surveyed, 31.9% reported having pain in their abdomen that felt swollen or constricted. An intestinal blockage was evident in one of the patients when they arrived. A patient was sent to the operating room for a paraumbilical hernia surgery and emergency assessment when they showed symptoms of an intestinal blockage. Prior to being admitted to the hospital, the majority of patients (53.1%) experienced edema around their belly buttons for one to three years of the patients, 12.7% experienced swelling for 0 to 5 months, and 21.2% for 6 to 11 months. Within our patient group, 85.1% of the edema was below the umbilicus and 14.8% was above it. Despite the fact that most paraumbilical hernias are incurable or only partially reversible, our study found that 97.8% of patients had cough impulses and that all of them had reversible edema [18]. Only one patient had an intestinal blockage and an irreversible edema; the other patient did not have the urge to cough. The surface of the skin changed in long-term situations [19]. Weak abdominal muscles were observed in 21.2% of the observed individuals. For females, having more than one child was the most frequent cause. Of the 34 cases, 24 (or 70.5%) were parents of multiple children. This is due to a weakening and stretching of the musculoaponeurotic layer in front of the abdominal wall. Obesity ranked second in frequency among 20 patients (58.8%). The Mayo theory, which states that obesity causes the abdominal wall to draw down on a fixed location on the umbilicus while the wall's vertical size grows, can be used to explain pathogenesis. Aponeurosis is weakened when fat enters muscle bundles and layers, increasing the risk of a hernia. Long-term cough and constipation were less common causes [20]. In 6 cases (46.1%) involving men, being overweight was the most common cause, followed by smoking in 4 cases (30.7%). Smoking breaks down collagen fibers, which makes it a major risk factor for inguinal hernias. The paraumbilical hernia is comparable. Ascites, prolonged physical labor, and chronic cough (COPD) are other factors that may contribute to it [21]. Certain patients had more than one underlying cause of their illness, while others had none at all. Thirty patients (63.8%) had a whole less than 4 cm, fifteen patients (31.9%) had a hole

between 4 and 6 cm, and two patients (4.2%) had a hole larger than 6 cm. According to a study by Massimiliano Fabozzi et al., surgical flaws in the open group measured 12.6+9.2 cm in average, while those in the laparoscopic group measured 11.4+9.7 cm. Five individuals had high blood pressure and five had diabetes, but no other illnesses [28]. The linked disorders that these patients had good care for prior to surgery meant that the outcome was not significantly affected. Within this cohort, 19 patients (40.4%) underwent laparoscopic prosthetic mesh replacement, while 19 patients (40.4%) underwent open prosthetic mesh replacement. Two underwent inlay mesh repair, ten underwent only mesh repair, and seven underwent properitoneal mesh repair out of the 19 patients who underwent open prosthetic mesh repair. Anatomical repair was done vertically on nine patients. The frequency of postoperative problems varies depending on the type of operation. Problems following an open mesh repair included seroma (21%), wound infection (10.5%), wound dehiscence (10.5%), and skin necrosis (10.5%). There is significant skin necrosis in two patients who had an open mesh paraumbilical hernia repair; these patients require daily dressing, wound debridement, DE sloughing, and secondary suturing [22]. A seroma was discovered in a patient who underwent a vertical anatomical repair. Other complications with laparoscopic mesh repair were pain in the tip of the shoulder and nausea, which were managed with analgesics and medications. The rates of complications following surgery varied between laparoscopic and open mesh repairs ($p < 0.05$) [23]. The mean duration of hospitalization following an open mesh repair in this cohort was 13.05 days, with a standard deviation of 4.85 days. Patients spent an average of 9.391.11 days in the hospital following a laparoscopic mesh repair. The amount of time spent in the hospital following surgery varies between laparoscopic and open mesh repair ($T=3.232$, $P=0.0026$). Gonzalez R, et al. 45 discovered in his research that open mesh repair required a lengthier hospital stay [24].

Patients who underwent an open mesh repair recovered from surgery in 3.571.26 days, but those who underwent a laparoscopic mesh repair required 2.840.37 days to return to their regular lives. Returning to everyday life is statistically different after Open Mesh surgery compared to Laparoscopic Mesh repair ($T=2.423$, $P=0.0205$) [25].

Patients were evaluated one week, one month, and six months following surgery, and the intensity of their pain was graded on a scale of 0 to 10 using the Universal Pain Assessment Tool. The average pain score for open mesh repair was 3.42 1.42 after one week, 0.89 1.14 after one month, and 0.68 0.94 after three months (6 months). The average pain score following laparoscopic mesh repair was 2.15 0.60 at one week, 0.42 0.69 at one month, and 0 at three months (6 months). The pain levels for laparoscopic and open mesh repairs differ statistically ($p < 0.05$) [25].

Not a single patient in our study experienced a recurrence of their paraumbilical hernia. A prospective, randomised trial was conducted to evaluate the effectiveness of laparoscopic paraumbilical hernioplasty in comparison to the open technique. Forty patients with paraumbilical hernias were examined and compared by researchers [25].

No hernia recurrence occurred in either group; however, patients who had prior hernia repairs and those whose hernias were larger than 3 cm following laparoscopic repair saw fewer recurrences. Massimiliano Fabozzi et al. discovered that there was a 4% recurrence with laparoscopic mesh repair and a 7% recurrence with open mesh repair at a one-year follow-up.

Conclusion

Our clinical study allows us to state the following. A total of 47 patients who had paraumbilical hernias at hospital admission underwent various surgical procedures for their treatment. An incidence of paraumbilical hernia is higher in people between the ages of thirty and fifty. In every situation, surgery is the preferred course of action. The Mayo repair is considered the classic. Better non-absorbing suture materials have been used in surgical repairs for healthy patients, with favorable outcomes and a low recurrence rate.

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Conflict of interest: None

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