

ETIOLOGY, CLINICAL FEATURES AND FACTORS ASSOCIATED WITH DEVELOPMENT OF UMBILICAL HERNIA: A HOSPITAL BASED STUDY

Nagendra Kumar Rajsamant¹, Deepak Ranjan Nayak¹, Udayanath Behera², Sridhar Panda³

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Corresponding Author:

Dr. Sridhar Panda,

Email: drsridharpanda@gmail.com

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¹Assistant Professor, Department of Surgery, SCB Medical college and Hospital, Cuttack, Odisha, India.

²Assistant Professor, Department of Anaesthesia, SCB Medical college and Hospital, Cuttack, Odisha, India.

³Assistant Professor, Department of Medicine, SCB Medical college and Hospital, Cuttack, Odisha, India.

Abstract

Background: Umbilical hernia is a common hernia that occurs when the umbilical scar fails and stretches, causing abdominal contents to protrude through the opening. The management of Umbilical hernias is one of the common surgical problems, with small defects being repaired surgically without undue tension and recurrence rate being low. This study consists of clinical study with attention being given to sex distribution, etiological factors, clinical presentation, management and complications. **Materials and Methods:** The study included all umbilical hernias admitted and treated in SCB medical college and hospital from October 2018 to October 2020. The cases were selected at random, excluding patients with severe comorbid conditions and those undergoing emergency surgery. Clinical data were collected on preprepared Performa. Statistical software was used to analyze the mean postoperative hospital stay, mean size of defect and mean follow-up period between the different surgical procedures. **Result:** 50 patients with umbilical hernia were admitted and treated with various surgical procedures from October 2018 to October 2020. Umbilical hernia is more common between 3rd and 5th decade of life. It is more common in females (68%) than in males (32%). The mean follow up period for Mayo's repair was 13.15 months with SD of 7.98 months, while for Mesh repair it was 10.74±6.39 months. The majority of patients had swelling for 1 to 3 years before presenting to the hospital, with the longest duration of symptoms being ten years and two patients had swelling since childhood. Mayo's repair and Mesh repair were the main topics of discussion, and the incidence of different types of hernia operated in the hospital was 69.2%, incisional hernia-15.4%, and femoral hernia-0.3%. Chronic cough and constipation were two less common precipitating factors. There is no difference in postoperative hospital stay following Mayo's repair and mesh repair. **Conclusion:** Umbilical hernia is one of the common hernias operated in this medical setup. It is more common in middle-aged group and in females. Patient presented with spectrum of symptoms and signs, swelling being more common presenting symptom with or without pain.

INTRODUCTION

Umbilical hernia is a common hernia that occurs when the umbilical scar fails and stretches, causing abdominal contents to protrude through the opening. It is divided into three groups: infants, children, and adults.^[1-5] Infant and children's umbilical hernias are rarely the sites of obstruction and strangulation, while adults and older patients are more likely to

have obstruction. Urgency of repair is greater for adults than infants.^[6-8]

Umbilical hernias generally are acquired lesions. It is conceivable that in many individuals relative weakness occurs in the umbilical ring when intra-abdominal pressure rises as in extreme obesity or number of repeated pregnancies. Protrusion appears at the ring and poorly supported umbilical scar.^[6,9-12] The management of Umbilical hernias remain one of the common surgical problems. If the defect is

small it can be repaired surgically without undue tension and recurrence rate is very low. But large Umbilical hernias with wide openings are difficult to manage by anatomical repair, which, if done, will result in early recurrence due to undue tension resulting in tissue necrosis.^[7,9,11,13-16] Such hernias should be treated with prosthetic mesh repair. Surgeons searched diligently for a material to implant in the abdominal wall that could add strength while avoiding excessive tension created when large defects were bridged by prosthetic mesh.^[8,17-21]

A number of operations are presently employed in the management of Umbilical hernia with an aim to effect a permanent cure. The recurrence rate, which was high in preantibiotic era, has almost nullified with safe anaesthesia, antibiotics, antisepsis and with greater understanding of anatomy, closed drains, implants like prolene mesh. Currently judicious use of following three concepts in the repair of Umbilical hernia has resulted in low morbidity, recurrence rates. They include first use of imbricated several layers in an attempt to reinforce surgical repairs. Secondly, the use of synthetic prosthesis to buttress repair and thirdly laparoscopic approach.^[7,9,11,14,22-25] This study consists of clinical study with attention being given to sex distribution, etiological factors, clinical presentation, management and complications.

Objective

To study etiology, clinical features and factors associated with development of Umbilical hernia.

MATERIALS AND METHODS

Study included all umbilical hernias admitted and treated in SCB medical college and hospital from October 2018 to October 2020. A detailed clinical performa for collecting information on clinical management of umbilical hernia treated with both anatomical repair and reinforcement with mesh, was prepared. The cases were selected at random. All patients of non-pediatric age group were selected at random. Patient with severe comorbid conditions (severe cardiopulmonary disease, uncontrolled ascites) and patients undergoing emergency surgery were excluded. No other particular criteria have been adopted in selection of cases.

During collection of clinical data importance was given to following factors: Umbilical hernia, Clinical history, progression in size, 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. In local examination special attention was given to the position, size, shape, composition, cough impulse, reducibility, skin over the swelling, size of defect in linea alba and tone of abdominal muscles.

In routine general physical examination attention was given to obesity, hypertension, in finding cause of abdominal distension, per-rectal examination to look for mass (malignant) in the rectum, benign prostatic enlargement, examination to look for external meatal stenosis and stricture urethra in males. Respiratory system examination to look for rhonchi, crepitations suggestive of COPD. All cases were clinically diagnosed and all patients included in the study underwent surgery following preoperative investigation in the form of Hb%, BT, CT, FBS, PPBS, Blood urea, serum creatinine, urine for albumin, sugar and microscopy, ECG, chest X ray. No other special investigations were required for any of the patients except patients who underwent ultrasound examination of the abdomen for ascites. Informed written consent was obtained after explaining the surgical procedure and its results.

The Chi square and Fisher Exact test has been used to find the significance of proportions of postoperative complications and recurrence. Descriptive statistics was used to find the significance of mean postoperative hospital stay, mean size of defect and mean follow-up period between the different surgical procedures. The Statistical software namely SPSS 10.0 were used for the analysis of the data and Microsoft Word and Excel have been used to generate graphs, tables etc.

RESULTS

The study was carried out from October 2018 to October 2020 and a total of 50 patients were enrolled as study participants in the study. The age distribution of study participants is provided in [Figure 1]. This figure shows that majority of the patients are in the age group of 30-50 years. Only 7 patients were above 60 years.

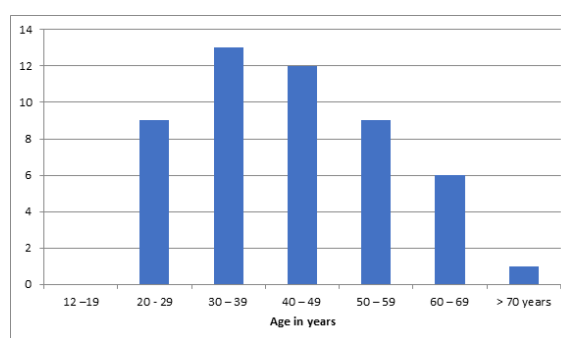


Figure 1: Age distribution of Umbilical Hernia cases

Out of total 34 patients (68%) were female and 16 patients (32%) were male. Mean age distribution in females was 42.88 ± 13.61 ; and in males was 41.06 ± 11.85 .

[Table 1] provided the details regarding the presence of symptoms in study participants. Most common symptom that patient presented with was swelling around the umbilicus. 30% of patients had associated pain in the swelling or dragging type of

pain in the abdomen. 1 patient had symptoms of intestinal obstruction.

The [Table 2] shows that 44% of patients had swelling around the umbilicus for 1-3 years before

presenting to hospital. 20% of patients had swelling for 6-11 months; 16% had swelling 0-5 months.

Table 1: Presentation of Symptoms

Symptoms	Number	Percentages
Swelling around Umbilicus	50	100.0
Pain in the Swelling or Pain Abdomen	15	30.0
Symptoms Suggestive of Intestinal Obstruction	1	2.0

Table 2: Duration of Symptoms

Duration	Number	Percentage
Since Childhood	2	4.0
0-5 months	8	16.0
6-11 months	10	20.0
1 year –3 years	22	44.0
3 years –6 years	5	10.0
6 years –10 years	2	4.0
More than 10 years	1	2.0

In our study, umbilical and below umbilical swelling was present in 80% of patients; above umbilical swelling was present in 20% of patients. Hernia was reducible with cough impulse present in 92% of patients. Tone of abdominal muscle was poor in 30% of patients. The details are provided in [Table 3].

Table 3: Distribution of signs

Signs	Number	Percentage
Supraumbilical(M2) Swelling	10	20.0
Umbilical(M3) and Infraumbilical(M4) Swelling	40	80.0
Cough impulse present	46	92.0
Reducible	46	92.0
Overlying Skin Changes	3	6.0
Weak Abdominal Muscle tone	15	30.0

In females most common precipitating factor of Umbilical hernia was multiparity (91.2%) followed by obesity (50%), constipation (5.9%) and chronic cough (2.9%).In males most common precipitating factor was obesity (50%) followed by smoking (37.5%), chronic cough (25%) and heavy manual work (6.3%).

Table 4: Precipitating factors among study participants

Precipitating factors		Number (n=34)	Percentage
Females	Multiparity (≥ 2 children)	31	91.2
	Obesity	17	50.0
	Chronic Cough	1	2.9
	Constipation	2	5.9
	Ascites	0	0.0
Male	Obesity	8	50.0
	Smoking	6	37.5
	Chronic Cough	4	25.0
	Constipation	0	0.0
	Difficulty in Micturation	0	0.0
	Ascites	1	6.3
	Manual Work	1	6.3

In our study, 23 patients (46%) underwent Mayo's repair, 23 patients (46%) underwent prosthetic mesh repair in which 15 were sub lay mesh repair, 7 were on lay and 1 was inlay mesh repair and 4(8%) patients underwent vertical anatomical repair.

Table 5: Surgical procedures among study participants

Procedures	Number (n=50)	Percentage
Mayo's Repair	23	46.0
Vertical Anatomical Repair	4	8.0
Prosthetic Mesh Repair	23	46.0
SubLay	16	65.2
On Lay	7	30.4
Inlay	1	4.3

This table shows incidence of postoperative complication in different surgical procedures. Seroma was present in 3 patients, hematoma in one patient and wound infection in 2 patients in both groups (Mayo's repair and prosthetic mesh repair), Skin necrosis occurred in 1 patient following Mayo's repair. There is no significant statistical difference in postoperative complication in Mayo's repair and mesh repair.

Table 6: Postoperative Hospital stay

Procedures	Mean Hospital Stay (days)	SD
Mayo's Repair (n=23)	12.26	5.97
Mesh Repair (n=23)	11.30	6.87
Vertical Ana. Repair (n=4)	14.0	3.61

In [Table 6] Mean hospital stay of study participants after surgery is provided.

The [Figure 2] shows the size of the defect was < 2 cm in 28 patients (56%), between 2-4 cm in 18 patients (36%) and > 4 cm in 4 patients (8%).

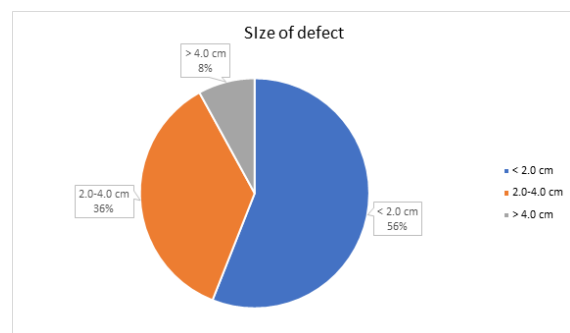


Figure 2: Size of defect

DISCUSSION

From October 2018 to October 2020, 50 patients with umbilical hernia were admitted and treated with various surgical procedures in this clinical study. The same group of patients was studied for study period incidence, clinical features, treatment, and postoperative complications. Mayo's repair and Mesh repair are the main topics of discussion because they make up the majority of the sample. Incidence of different types of hernia operated in our hospital is as follows: Inguinal hernia - 69.2%, incisional hernia-15.4%, Umbilical hernia-15.1% and femoral hernia-0.3%. Although the exact incidence of Umbilical hernia is not mentioned in available literature, it is considered one of the common hernias apart from inguinal hernias.

In our study, umbilical hernias were more common in patients aged 30-50 (51 percent). The paediatric population has been excluded from the study. In our study, the youngest patient with umbilical hernia was 20 years old. Only one patient was over the age of 70, indicating that umbilical hernia is uncommon after that age. Females are more likely to suffer from umbilical hernia. There were 34 female patients and 16 male patients. The ratio of female to male sex in the literature is 3:1. In our study, the ratio is 2.13:1. There is no statistically significant difference in age distribution between males and females, as disease is more common in both sexes between the third and fifth decades.

The majority of the patients had swelling for 1 to 3 years before presenting to the hospital. The longest duration of symptoms was ten years, and two patients had swelling since childhood. The minimum period was one month. In our series, swelling was present below the umbilicus and in the umbilicus position in the majority of patients (80%), but not above the umbilicus (20 percent). Although most umbilical hernias are irreducible or partially reducible, in our study, cough impulse was present and swelling was reducible in 92 percent of patients. Only four patients had no cough reflex and irreversible swelling. Long-standing cases had overlying skin changes.^[3] Thirty percent of the patients had low abdominal muscle tone. In females, most common precipitating factor was multiparity. Out of 34 patients 31 (91.2%) were multipara. This is due to the stretching and weakening of the anterior abdominal wall's musculoaponeurotic layer. Obesity was the next most common precipitating factor, affecting 17 patients (50 percent). Pathogenesis can be attributed to the Mayo theory, which states that obesity causes downward traction on the abdominal wall bearing on a fixed point on the umbilicus, which is associated with an increase in the vertical dimension of the abdominal wall. Fat penetrates muscle bundles and layers, weakens aponeurosis, and promotes hernia formation. Chronic cough and constipation were two less common precipitating factors.

Obesity was the most common precipitating factor in males (8 patients (50 percent), followed by smoking (6 patients) (37.5 percent). Smoking is a major risk factor for the development of inguinal hernia because it causes collagen fiber degeneration, which is also true for umbilical hernia. Other precipitating factors include chronic cough (COPD), ascites, and strenuous manual labour. Some patients had more than one precipitating factor, while others did not have any precipitating factor at all.

Although cases were randomly selected for particular surgical procedure, size of defect, age of patient and tone of abdominal muscles has been considered. Mesh repair has been done for most of the large defects. Among 23 patients who underwent mesh repair 18 patients had defect size of >2 cms, 4 patients had defect size of >4 cms. And 1 young patient with size<2cms. Mean size of defect was 3.962 cm with SD 2.29 cms. Among 23 patients

who underwent Mayo's repair 21 patients had defect Size of < 2 cms and 2 patients with defect size >2 cms Mean size of defect was 1.53 cm with SD 0.69 cm. Mean size of defect for which vertical anatomical repair done was 2.1 cm. There is statistical difference in defect size for which Mayo's and Mesh repair has been done.

Patient who underwent shoelace repair developed superficial wound dehiscence. There is no significant difference in percentage of postoperative complications between Mayo's repair and Mesh repair. Incidence of immediate postoperative complication is high compared to a study conducted by A Arryo et al. in 2001. But there is no difference in postoperative complication between Mayo's repair and Mesh repair similar to that study.^[9]

In our study, out of 23 patients who underwent Mayo's repair two patient had recurrence of umbilical hernia (8.7%), there were no recurrence following Mesh repair. In study conducted by A Arryo recurrence rate following suture repair (Mayo's repair) was 11% and 1% following Mesh repair. This recurrence can be attributed to tension on repair caused by Mayo's repair. Although there is no significance difference in recurrence following Mayo's repair and Mesh repair ($p=0.207$), there is statistical trend towards difference in recurrence following Mayo's repair and Mesh repair i.e. high recurrence rate following Mayo's repair.^[9]

Mean follow up period following Mayo's repair was 13.15 months with SD of 7.98 months. Mean follow up period following Mesh repair was 10.74 ± 6.39 months. There is no significance difference in recurrence following Mayo's repair and mesh repair, p value = 0.207, but there is statistical trend towards the difference between two procedures regarding recurrence, this trend may be converted to significance difference, if sample size and follow up period is increased. To conclude, it can be said that sample size and follow up period in our study is small to show significance difference between two procedures.

CONCLUSION

Umbilical hernia is one of the common hernias operated in our setup. It is more common in middle-aged group and in females. Patient presented with spectrum of symptoms and signs, swelling being more common presenting symptom with or without pain. Associated diseases like diabetes mellitus, hypertension, and anaemia may affect outcome in terms of increased postoperative complications in

these patients. Surgical procedures include Mayo's, vertical anatomical, prosthetic mesh, and shoelace repair.

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