

A DESCRIPTIVE STUDY OF UMBILICAL HERNIAS AND THEIR POST-OPERATIVE OUTCOMES AT A TERTIARY CARE CENTRE

General Surgery

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ABSTRACT

Background: This paper presents a descriptive observational study on Umbilical hernia, which 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. **Materials and Methods:** The study included all umbilical hernias admitted and treated at Akash Medical College and Hospital from March 2024 to January 2026. The cases included were all adult UH patients, excluding patients with other types of hernia. **Result:** Umbilical hernia is more common between the 3rd and 5th decades of life. It is observed that the distribution of UH is more or less equal in females (47.1%) and males (52.9%). It is observed that majority of the patients had a waist hip ratio above 0.8, indicating that centripetal obesity may be a major risk factor for umbilical hernia. **Conclusion:** Umbilical hernia is more common in the middle-aged patients. Patients presented with a spectrum of symptoms and signs, swelling being the most commonly present symptom, with or without pain. Quick return to day-to-day activities was seen with IPOM surgeries.

KEYWORDS

Umbilical Hernia, Para-umbilical Hernia, Open Hernioplasty, Ipom, Descriptive Study

INTRODUCTION

An abdominal wall hernia is the abnormal protrusion of an organ or tissue through a defect in the surrounding musculo-fascial layers [1]. Umbilical hernias (UH) and paraumbilical hernias (PUH) are primary ventral hernias occurring within or adjacent to the umbilicus and account for approximately 6–14% of all adult abdominal wall hernias, making them the second most common abdominal wall hernias after inguinal hernias. Globally, nearly 20 million abdominal wall hernia repairs are performed annually.

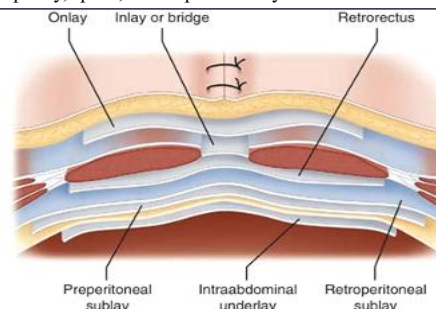
In adults, approximately 90% of umbilical hernias are acquired and develop due to weakness of the umbilical fascia combined with factors that increase intra-abdominal pressure. Common risk factors include obesity, multiple pregnancies, chronic cough, constipation, ascites, heavy manual labour, previous abdominal surgery, and connective tissue disorders. Although many umbilical hernias remain asymptomatic initially, they may enlarge over time and become painful, irreducible, incarcerated, or strangulated, necessitating emergency surgical intervention.

Diagnosis is primarily clinical, with ultrasonography and computed tomography serving as valuable adjuncts when the diagnosis is uncertain or to define the defect and its contents. Despite advances in surgical techniques, postoperative outcomes continue to be influenced by patient characteristics, hernia size, comorbidities, and the type of repair performed. Surgical repair remains the definitive treatment for symptomatic adult umbilical hernias. Available operative techniques include primary tissue repair, open mesh repair using various mesh positions (on lay, sub lay, inlay, or underlay), laparoscopic intraperitoneal on lay mesh (IPOM) repair, and robotic-assisted repair. Mesh-based repairs have demonstrated lower recurrence rates than primary suture repair and are currently recommended for most defects larger than 1–2 cm. The planes of mesh placement is depicted in Figure 1.

OBJECTIVES

- To study the clinical presentations of umbilical hernias.
- To assess the pact of pre-operative co-morbidities on post-operative outcome
- To assess the impact of operative procedures (lap/open, mesh/non-mesh hernia repairs) on postoperative outcome

Fig 1. planes of mesh placement



LITERATURE REVIEW

The available literature on cohort studies to determine the natural history of untreated ventral hernia is scarce. Hence, many surgeons recommend that these hernias be repaired when discovered. Abhinava D.M et al [2] at BMCRI Bengaluru, in their cohort study of laparoscopic versus open umbilical hernia repair, have considered 96 cases from 2015-2017. However, this study has not considered the pre-operative conditions and factors which could have an impact on the post-operative outcomes. Sriharsha Koru Konda et al [3], have made a prospective cohort study from 2014 to 2016 of 40 patients and observed that post-operative complications are relatively less in laparoscopic group though statistically not significant. retrospectively. A descriptive cross-sectional study of pooled Hernia to estimate the prevalence rate recording patient details has been carried out in 2023 by Kishore Kumar Deo et al [4] Nagendra Kumar et al [5], in their paper have discussed the factors associated with development of Umbilical Hernia and presented the statistical analysis. L. J. Madsen et al [6], have carried out a systematic review and meta-analysis of mesh vs suture in elective repair of Umbilical Hernia. V. Mruthyunjayadul and Shikha Burman [7] in their paper have presented a study of around 50 umbilical hernia cases.

METHODOLOGY

Study Design: Prospective and Descriptive study

This is a prospective observational surgical study comprising 34 cases of para-umbilical and umbilical Hernias. It was completed by taking a patient's medical history, doing a clinical examination, and conducting the necessary investigations for the operations and repair procedure performed and observing post-operative outcomes.

Sampling Method:

For selecting sample size single proportion formula and Convenient sampling method is adopted for this study. Sample size was estimated by using the prevalence of umbilical hernia among hernia subjects at among oligohydramnios pregnant women at 8.61% from the study by using the formula

$$\text{Sample size (N)} = Z_{1-\alpha/2}^2 p(100-p) / d^2$$

Where,

$Z_{1-\alpha/2}$ = Is standard normal variate
(at 5% type I error ($P < 0.05$) it is 1.96).

p = Expected proportion in population based on previous studies = 8.61 %
 d = Absolute error or precision = 10

$p = 8.61$

$q = 100 - p = 91.39$

$d = 10\%$

Using the above values at 95% Confidence level a sample size of 31 subjects with umbilical hernia will be included in the study.

Considering 10% non-response a sample size $n = 31 + 3.1 \approx 34$ subjects will be included in the study.

Source of data and data collection

All patients with umbilical hernia admitted in Akash Super Speciality Hospital, Devanahalli, Bengaluru, are taken for this prospective study from March 2024 to January 2026. The approval of the institutional ethical board was obtained from Akash Institute of Medical Sciences. The patients were taken up for surgery after written informed consent

Inclusion criteria:

- All patients of umbilical hernia
- Patients willing to give informed consent

Exclusion criteria:

- Patients with other types of hernia
- Patients presenting with recurrent hernia, incisional hernia of the umbilical region, were excluded from the study

Informed consent was taken from patients. 34 Umbilical hernia repair procedures performed are analysed, and for each patient record of 22 variables is scrutinised and entered into the data frame. The following variables were collected and analysed.

Preoperative Characteristics

These included demographic data (age, gender), clinical presentation and common presenting symptoms of umbilical hernia, diagnosis, co-morbidities (if any), whether elective or emergency surgery, and any preoperative imaging findings.

Surgical Details

The type of surgical approach, such as Anatomical repair, open hernioplasty, and Laparoscopic IPOM and intraoperative techniques used to manage and any adjunctive procedures performed were recorded.

Postoperative Outcomes

All the patients were monitored postoperatively, and Postoperative clinical outcomes were recorded. These included the duration of hospital stay, development of postoperative complications such as pain, vomiting, surgical site infections, and seroma, hematoma, and reoperation rates. In-hospital mortality and any need for readmission were also recorded. Procedure adopted and complications were studied.

Statistical analysis

All the observed data were used to prepare the master data chart in excel sheet. The data processing, statistical analysis and visual representation are carried out using Python programming in Jupiter Notebook. Standard Python packages were deployed for generating the results and for graphical representation of the analysis results.

Analysis carried out:

The detailed descriptive statistical analysis is mainly carried out for the distribution of compiled data. A data frame is generated for the recorded data after pre-processing. Distribution analysis of most of the

variables from the data frame for umbilical hernia in terms of gender, age, size of defect, zz symptoms, habits, risk factors, co-morbidities, USG findings, surgical procedure type, and post-operative pain level is carried out. Bar charts, pie charts, and box plots are deployed to visually represent the results.

RESULTS

Fig 2 depicts the age distribution of individuals who underwent umbilical hernia repair. The mean age was 54.76 years (range 36-74 years). Figures 3 to 11 are self explanatory.

Age	
count	34.00
mean	54.76
std	9.92
min	36.00
25%	49.75
50%	56.00
75%	61.00
max	74.00

Fig. 2- table of age distribution

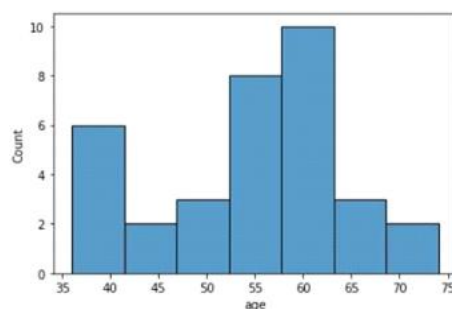


Fig.3 Bar chart for age distribution

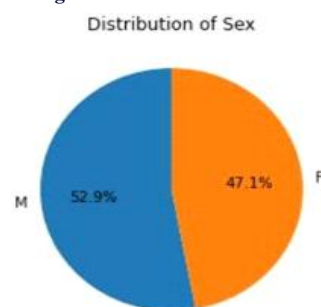


Fig.3 Pie chart showing distribution of sex

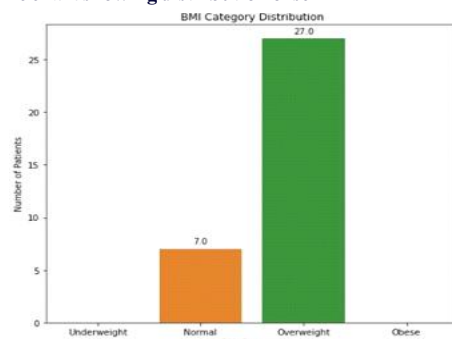


Fig.4. Bar chart showing distribution of BMI among UH patients

Fig. 5 Distribution of waist hip ratio in UH patients

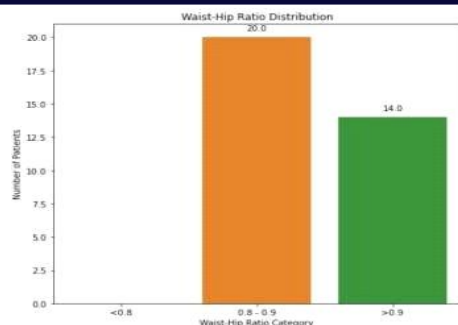


Fig.6 Distribution of chief complaints

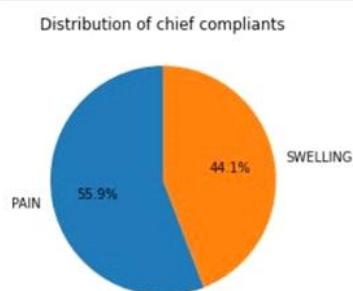


Fig.7. Distribution of comorbidities

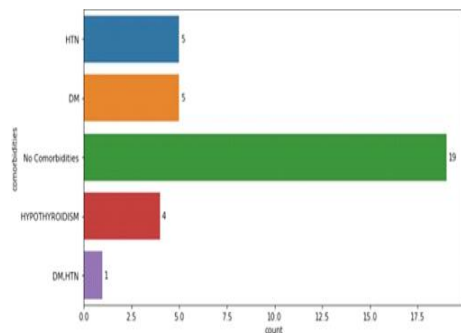


Fig.8 Habits associated with UH

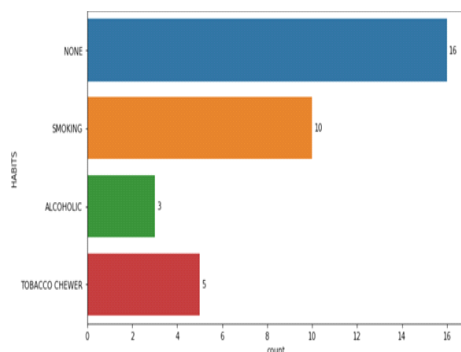


Fig.9 Risk factors in UH patients

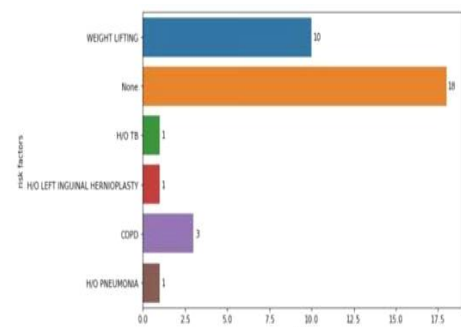


Fig 10 Examination findings in UH patients

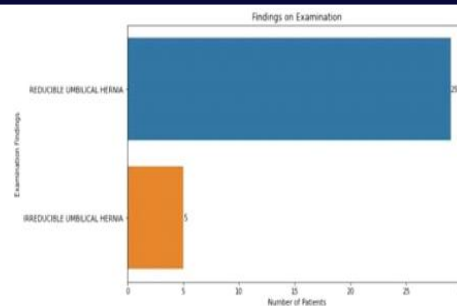
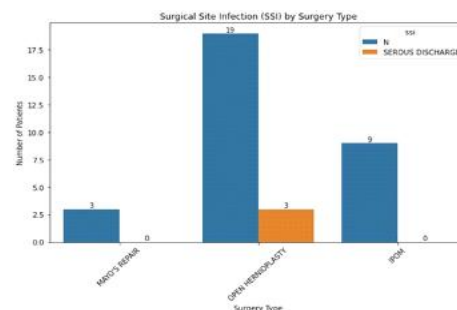


Fig.11 SSI incidence in various types of surgeries



DISCUSSION

In our study, umbilical hernias were more common in patients aged 50-65 (60 percent). Only two patients were over the age of 70, indicating that umbilical hernia is not common above this age. There is no statistically significant difference in age distribution between males and females, as the disease is more common in both sexes between the third and fifth decades. Almost all patients had reducible hernia. Waist Hip ratio also is seen to be more than 0.9 in most of the cases. Smoking and tobacco consumption are reported in around 50 % of cases.

CONCLUSION

- Umbilical hernia is one of the common hernias operated in our setup.
- It is more common in the middle-aged group and is seen both in males and females.
- Patient presented with a spectrum of symptoms and signs, swelling being the most common presenting symptom with or without pain.
- Associated diseases like diabetes mellitus, hypertension, and high BMI, and tobacco consumption, smoking etc , may affect outcome in terms of increased postoperative complications in these patients.
- Surgical procedures included: anatomical tissue repair, open Hernioplasty, and Laparoscopic IPOM. The combination of good SOP and the skill of experienced surgeons results in a successful outcome.
- It was observed that the majority of patients undergoing IPOM had faster return to day-to-day activities and shorter hospital stay. This greatly benefited the working class, who constituted most of our population.
- No significant difference was observed in open hernioplasty between retrorectus and onlay mesh repairs in our setup
- It was observed that patients with centripetal obesity had more pain and complications

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