



CLINICAL SPECTRUM OF OBSTRUCTED INGUINAL HERNIA IN A TERTIARY CARE HOSPITAL

General Surgery

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ABSTRACT

Background: An inguinal hernia is a protrusion of the content of the abdominal cavity or preperitoneal fat through a hernia defect in the inguinal area, irrespective of whether this is preformed. It is most common in men and may be Direct or Indirect. When the hernial contents gets obstructed patient often presented in emergency and in such case Open surgery is preferred with appropriate antibiotic coverage. The two surgical options are Herniorrhaphy and Hernioplasty. The main concern for mesh use is the difficulty in eradiating infection. **Aims and Objective :** To study the clinical presentation and management of obstructed inguinal hernia in the department of Surgery, AMCH, Dibrugarh during the study period. **Material And Methods :** Hospital based observational study was conducted from 1st June 2021 to 31st May 2022 in department of Surgery, AMCH, Dibrugarh. 50 consecutive patients fulfilling the selection criteria were studied during the study duration. **Results:** mean age of the patients was 51.5 ± 7.19 years, ranging from 12 to 82 years. It was observed that 42% of the patients were 41 to 60 years old. In addition, 92% of the patients were males. We observed that 4% of the patients were underweight, 12% had an ideal weight, 50% were overweight, and 34% were obese. Also, 52% were in ASA grade 1, 36% were in ASA grade 2, and 12% were in ASA grade 3. The most common presenting symptoms were pain and irreducible swelling, observed in all patients. 34% had a direct hernia, and 66% had an indirect hernia. The right side was involved in 46%, and the left was involved in the rest. The most common contents of the hernial sac were the small intestine (54%). Herniorrhaphy was done in 74%. In addition, hernioplasty was done in 18%, and resection and anastomosis with herniorrhaphy was done in 8% of the patients. Postoperatively, there were wound infections in 6% of cases, seroma in 4%, and postoperative hematoma and paralytic ileus was present in one case each. At 30 days postoperatively, two cases died (4%) in our study population due to cardiorespiratory failure. **Conclusion:** Inguinal Hernia is predominantly seen in males at the mean age group of 51.5 ± 7.19 years. In case of obstructed Inguinal Hernia the most common presenting symptoms are pain and irreducible swelling. The indirect hernia is more common and the small intestine is the most common hernial content. Herniorrhaphy was the most common treatment modality in case of obstructed Inguinal Hernia. Among the Post operative complications, most common one is wound infection.

KEYWORDS

Inguinal Hernia, Herniorrhaphy, Hernioplasty.

INTRODUCTION

An inguinal hernia or hernia inguinalis is a protrusion of the content of the abdominal cavity or preperitoneal fat through a hernia defect in the inguinal area, irrespective of whether this is preformed¹. Hernias are among the oldest recorded afflictions of humankind, and they are most commonly seen in the groin^{2,3}. Inguinal hernias are classified as direct and indirect hernias. The hernial sac of an indirect inguinal hernia extends obliquely from the internal inguinal ring to the external inguinal ring and finally into the scrotum. In contrast, the direct inguinal hernial sac protrudes outward and forward and is medial to the internal inguinal ring and inferior epigastric vessels⁴. The inguinal hernia is the most common hernia in men and women but much more common in men⁵. The lifetime risk of inguinal hernia is 27% in performed rapidly in a well-resuscitated patient with adequate postoperative high dependency or intensive care if necessary. Open surgery is preferred when a hernia is irreducible or if there is any risk of bowel resection. Infection may complicate these cases, but most surgeons would still use a lightweight, synthetic mesh repair covered by appropriate antibiotics⁵. Several meta analysis have shown that the use of mesh is superior to the non-mesh repairs in inguinal hernia surgery. The main concern for mesh use is the difficulty in eradiating infection. In the event of obstructed hernias, placement of prosthetic material is presumed to increase the risk of infection.

However, recent data shows mesh use is safe and does not increase infection risk in obstructed/strangulated hernias⁶. Generally, implantation of the prosthesis in case of massive contamination of the hernia sac is highly unrecommended, even when antibiotics are used⁷. The need for study arises because, even though the treatment of Inguinal hernias is simple, the patient's ignorance and the lack of adequate healthcare infrastructure in rural areas can lead to complications. This might result in prolonged morbidity and mortality too. The same can be prevented if the patients presenting with hernia undergo treatment on an elective basis. In our study, we are trying to determine the epidemiology and clinical spectrum of inguinal hernia with a special emphasis on obstructed inguinal hernia cases and their respective outcomes in this region and also to look at the different modalities of management in our institution.

AIMS AND OBJECTIVE

To study the clinical presentation and management of obstructed inguinal hernia in the department of Surgery, AMCH, Dibrugarh during the study period.

MATERIAL AND METHODS

Hospital based observational study was conducted from 1st June 2021 to 31st May 2022 in department of Surgery, AMCH, Dibrugarh.

Study Design: Hospital based observational study

Place Of Study: Department of General Surgery, Assam Medical College and Hospital, Dibrugarh, Assam.

Study Duration: One year (From 1st June 2021 to 31st May 2022).

Sample Size : Considering a 95% confidence interval with an absolute precession of 15% and the proportion obstructed inguinal hernia to the 36%, the sample size is calculated and rounded off to be 50.

Sampling: We included 50 consecutive patients fulfilling the selection criteria during the study duration.

Selection of Case: The patients numbered serially from 1 to 50 in the study group.

Subjects And Selection Method : All patients admitted to the surgical ward with an obstructed inguinal hernia.

Inclusion Criteria

All cases with obstructed inguinal hernia were admitted in 7 units of the Department of Surgery above 12 years.

Exclusion Criteria

Patients who did not give consent for the study.

Procedure And Methodology

After obtaining written informed consent

Patient's information regarding Name, age, sex, religion, address, Hospital numbers were recorded.

Detailed History, General Examination, Systemic Examination.

Required blood investigations and radiological investigations like Ultrasound abdomen, Plain X-Ray abdomen, Management of the patient and outcome was recorded.

Follow up.

Ethical Clearance: The study has been conducted after approval from Institutional Ethics Committee(H) of Assam Medical College and Hospital, Dibrugarh, and with written consent from each patient after explaining the study procedure to them in their own language.

Statistical Analysis

The data collected was tabulated in Microsoft Excel Worksheet and computer-based analysis was performed using the Statistical product and service solutions (SPSS) 20.0 software (SPSS, Chicago, Illinois, USA) and Microsoft Excel 2010. The categorical variables were summarized as proportions and percentages.

RESULTS

The result and observation have been recorded in the following tables and figures.

Age Distribution

Table-1: Table showing the patients affected with obstructed inguinal hernia in different age groups. Out of 50 Patients the youngest patient was of 12 years and the oldest patient was 82 years old. The peak incidence was noted in the 41-60 years age group. The mean age was being 51.5 ± 7.19 years.

Age group (years)	Frequency	Percent
12 to 20	6	12
21 to 40	13	26
41 to 60	21	42
61 and above	10	20
Total	50	100

Sex Distribution

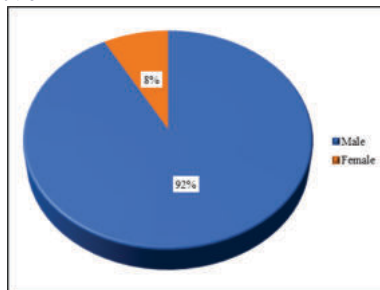


Figure -1: Pie diagram showing the Sex distribution of patients with obstructed inguinal hernia. In our series of 50 cases, there were 46 males (92%) and 4 females (8%).

Body Mass Index Distribution

Table-2: Distribution of patients according to their body mass index. It was observed that 4% of the patients were underweight, 12% had an ideal weight, 50% were overweight, and 34% were obese.

Body mass index (kg/m ²)	Frequency	Percent
Underweight (<18.5)	2	4
Ideal (18.5 to 23)	6	12
Overweight (23 to 27.5)	25	50
Obese (≥ 27.5)	17	34
Total	50	100

ASA Grade Distribution

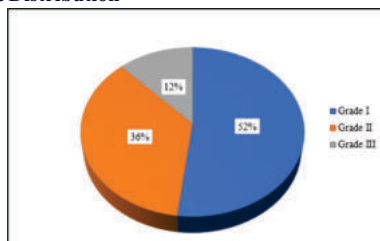


Figure-2: Distribution of patients according to their ASA grade. In our study population, 52% were in ASA grade 1, 36% were in ASA grade 2, and 12% were in ASA grade 3.

Addiction History Distribution

Table-3: Distribution of patients according to their addiction history. Based on the history obtained, it was found that 12% were current smokers, 6% consumed alcohol, 20% consumed both alcohol and smoked, and 52% had no history of alcohol consumption or smoking.

Addiction history	Frequency	Percent
Smoking	6	12
Alcohol	8	16
Both alcohol and smoking	10	20
None	26	52
Total	50	100

Past Medical History Distribution

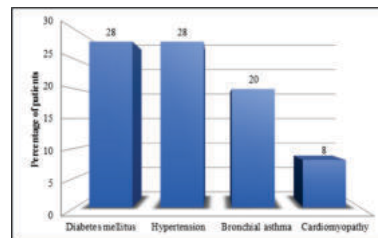


Figure-3: Distribution of patients according to their past medical history. Diabetes mellitus and hypertension was reported by 28% of the patients each. Past medical history of bronchial asthma was present in 20%, and past medical history of cardiomyopathy was present in 8%.

PRESENTING SYMPTOMS

Table-4: Table showing presenting symptoms of the patients with obstructed inguinal hernia. The most common presenting symptoms were pain and irreducible swelling, observed in all patients. Vomiting was reported by 52%, abdominal distension by 22%, dehydration by 16% and constipation by 14%.

Presenting symptoms	Frequency	Percent
Pain	50	100
Irreducible swelling	50	100
Vomiting	26	52
Abdominal distension	11	22
Dehydration	8	16
Constipation	7	14
Total	50	100

Time Of Presentation Since The Onset Of Symptoms

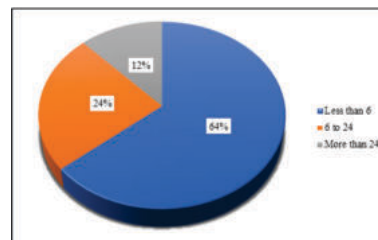


Figure - 4 : Bar diagram showing time of presentation since the onset of symptoms. The onset of symptoms was less than 6 hours in 64% of the patients, 6 to 24 hours in 24% and more than 24 hours in 12% of the patients.

Distribution Of Patients According To The Type Of Hernia

Table-5: Table showing Distribution of patients according to the type of hernia. In our study population, 34% had a direct hernia, and 66% had an indirect hernia.

Type of hernia	Frequency	Percent
Direct inguinal hernia	17	34
Indirect inguinal hernia	33	66
Total	50	100

Distribution Of Patients According To The Side Involved

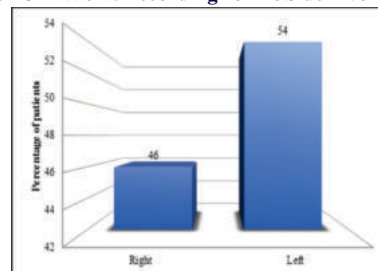


Figure-5: Bar diagram showing Distribution of patients according to

the side involved. In our patients, the right side was involved in 46% and the left side was involved in the rest.

Distribution Of Patients According To The Contents Of The Hernial Sac

Table-6: Table showing Distribution of patients according to the contents of the hernial sac. The most common contents of the hernial sac were the small intestine (54%). In addition, 32% had the large intestine, 14% had an omentum, and 6% had the small intestine and the omentum as the contents of their hernial sac.

Contents of the hernial sac	Frequency	Percent
Omentum	7	14
Small intestine	24	48
Large intestine	16	32
Small intestine + omentum	3	6
Total	50	100

Surgical Management

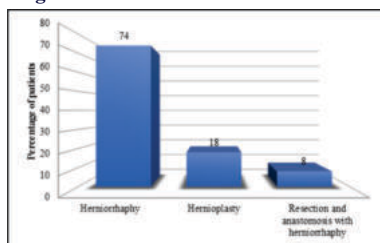


Figure-6: Bar diagram showing different modalities of surgical management. In the present study, herniorrhaphy was done in 74%. In addition, hernioplasty was done in 18%, and resection and anastomosis with herniorrhaphy was done in 8% of the patients.

Duration Of Hospital Stay (days)

Table-7: Table showing duration of hospital stay (days) of patients. It was observed that the mean length of hospital stay was 11 days, ranging from 4 to 17 days. Most patients stayed in the hospital for 11 to 15 days (46%). In addition, 36% stayed for 8 to 10 days, and 10% stayed for 7 days or less. It was observed that 6% stayed for more than 15 days.

Duration of hospital stay (days)	Frequency	Percent
≤ 7	5	10
8 to 10	18	36
11 to 15	23	46
More than 15	4	6
Total	50	100

Post-operative Complications

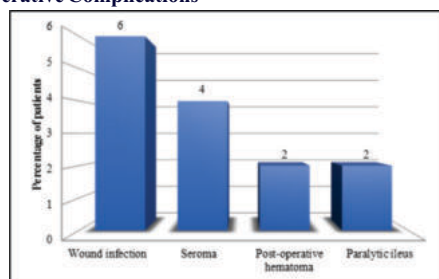


Figure-7: Bar diagram showing post-operative complications. In our study, postoperatively, there were wound infections in 6% of cases, seroma in 4%, and postoperative hematoma and paralytic ileus was present in one case each.

MORTALITY IN 30 DAYS

Table-8: Distribution of patients according to the 30 days mortality. Among our patients post-operatively, two cases died (4%).

30 day mortality	Frequency	Percent
Yes	2	4
No	48	96
Total	50	100

DISCUSSION

In our study, the mean age of the patients was 51.5 ± 7.19 years, ranging from 12 to 82 years. It was observed that 42% of the patients were 41 to 60 years old. Nearby mean age was found in Dasaratu et al.¹⁰, Malik and colleagues¹².

Out of the 50 patients of our study, 92% of the patients were males. Nearby results were found in Dasaratu et al (100% male)¹⁰, Faridi et al (100% male)¹¹, Malik and colleagues found predominantly male patients¹².

We observed that 4% of the patients were underweight, 12% had an ideal weight, 50% were overweight, and 34% were obese. Also, 52% were in ASA grade 1, 36% were in ASA grade 2, and 12% were in ASA grade 3. Based on the history obtained, it was found that 12% were current smokers, 6% consumed alcohol, and 20% consumed both alcohol and smoked. In addition, diabetes mellitus and hypertension was reported by 28% of the patients each. Dasaratu et al observed that mean BMI of the patients was 24.5 ± 3.6 kg/m² and 65% were ASA grade 2. Smoking (28%), diabetes (22%), obesity (20%) and hypertension (17%) were common co-morbidities¹⁰.

We found that the most common presenting symptoms were pain and irreducible swelling, observed in all patients. Vomiting was reported by 52%, abdominal distension by 22%, dehydration by 16% and constipation by 14%. Padmasree et al. observed that pain was present in almost all the cases. 30 cases presented with a history of vomiting. Absolute constipation was present in 8 cases. The main duration of constipation is 1 to 3 days. In 22% of the cases, there was a history of distension of the abdomen⁸. Prasad et al. found that inguinoscrotal pain was the most common presenting symptom (66%), and other symptoms were vomiting (13%) and abdominal pain (27%)⁹.

The onset of symptoms was less than 6 hours in 64% of the patients, 6 to 24 hours in 24% and more than 24 hours in 12% of the patients. Faridi et al. observed that 56 patients presented within 6 hours, 23 patients presented in 6-24 hours, and 15 patients presented after 24 hours of the onset of symptoms¹¹. Dasaratu et al. observed that 59% of patients were brought to their hospital within 6 hours of the onset of symptoms¹⁰. Padmasree et al. reported that 47.16% had a duration of obstruction for less than 1 day, 24.52% had obstruction for 1 to 2 days, 20.75% for 2 to 3 days and 7.54% had obstruction for more than 3 days⁸.

In our study population, 34% had a direct hernia, and 66% had an indirect hernia. The right side was involved in 46%, and the left side was involved in the rest. The most common contents of the hernial sac were the small intestine (54%). In addition, 32% had the large intestine, 14% had the omentum, and 6% had the small intestine and omentum as the contents of their hernial sac. Dasaratu et al. observed that Intraoperatively, indirect inguinal hernia (69%), left sided hernia (59%), and irreducible hernia (39%) with small intestine content (65%) were most common findings¹⁰. Faridi et al. found that out of 94 patients 87 had an indirect inguinal hernia, and 7 patients had a direct inguinal hernia. There were 77 patients with obstruction & strangulation, and the contents of the sac were as follows: small intestine - 61 patients, Omentum - 4, transverse colon - 11, incarcerated vermiform appendix in 1 Patient. The irreducible inguinal hernia was present in 17 patients, and the contents were sigmoid colon and cecum in 13 patients (sliding hernia), and in 4 patients, the transverse colon was present. Pre-operatively features of strangulation were present in 57 patients, which gradually returned to normal after the obstruction was relieved¹¹.

In the present study, herniorrhaphy was done in 74%. In addition, hernioplasty was done in 18% and resection and anastomosis with herniorrhaphy was done in 8% of the patients. Similar distribution of such surgical management were found in the studies of Dasaratu et al., hernioplasty with mesh repair was the most common procedure, done in 52% of patients. Other procedures were adhesiolysis with hernioplasty with mesh repair (22%), omentectomy and hernioplasty with mesh repair (17%), bowel resection with end-to-end anastomosis and hernioplasty with mesh repair (9%)¹⁰. Padmasree et al., observed that hernia contents replacement in the abdomen with hernioplasty was done in 47.1%, the release of adhesion with replacement of sac contents in the abdomen with hernioplasty was done in 28.3%, omentectomy and modified Bassini's repair was done in 16.9% and Bowel resection, end to end anastomosis and Modified Bassini's repair was done in 7.5% of the patients⁸.

In our study, we observed that the mean length of hospital stay was 11 days, ranging from 4 to 17 days. Most of the patients stayed in the hospital for 11 to 15 days (46%). In addition, 36% stayed for 8 to 10 days, and 10% stayed for 7 days or less. It was observed that 6% stayed

for more than 15 days. Faridi et al. reported that the mean length of hospital stay was 5.17 +/- 1.09 days, with a range of 4-13 days¹¹. Malik et al. reported average postoperative hospital stay was 5.6 days (range = 2 to 18 days)¹². Prasad et al. found that the average postoperative hospital stay was 5 days (range = 2-18 days)⁹. In a similar study, Rao et al found that the mean duration of hospital stay was 2.05 ± 0.79 days¹³.

In the present study, postoperatively, there were wound infections in 6% of cases, seroma in 4%, and postoperative hematoma and paralytic ileus was present in one case each. We could not conduct a longer follow to assess for the recurrence of the hernia. Incidence of recurrent hernia after primary repair varies from 1% in specialized centres to 30% in a general survey; most are within 2–3 years after primary repair¹⁴. Thus, mesh repairs have lower recurrence rates even in emergencies. Recurrence after mesh hernia repair is related to technical factors such as inadequate dissection, insufficient prosthesis size and fixation, and surgeon skill. Any physical objection to mesh, such as foreign body rejection or untreatable infection that require mesh removal, was not substantial, and the use of mesh did not appear to increase the incidence of infection or alter the incidence of superficial wound infection¹⁵. In a similar study, Dasaratu et al. observed that common complications noted in the study were wound infection (6%), seroma (4%), post-operative hematoma (2%) and respiratory disturbances (2%)¹⁰. Faridi et al., observed that the incidence of wound infection was 5.3% (5 patients) which was managed conservatively. The incidence of seroma formation was 12.7% (12 patients), including 07 patients with irreducible inguinal hernia. It was also managed conservatively. None of the patients required mesh removal¹¹. In the study by Malik et al., 6 patients (15.38%) developed seroma in the postoperative period, which was managed by adequate drainage. 4 patients (10.25%) had culture-proven wound site infection but responded well to local drainage and antibiotics. 2 (5.12%) patients developed systemic sepsis due to local wound site infection and required re-exploration with the removal of mesh, thorough cleansing of the wound and primary tissue repair of posterior wall of the inguinal canal¹². Padmasree et al. observed that postoperative seroma was present in 5 patients, hematoma was present in 1 patient, and infection was present in 5 cases. Respiratory disturbances comprising non-expectorant cough without dyspnea were observed in 3 cases. Paralytic ileus was found in 1 case. Paresthesia was observed in 3 cases⁸.

In case of mortality we found that, at 30 days post-operatively, two cases of our study died (4%) in our study population due to cardiorespiratory failure. Faridi et al., observed that one patient of their study population died¹¹. Dasaratu et al. observed no mortality in their study¹⁰. Padmasree et al. reported that death occurred in 3.77% of obstructed inguinal hernia cases treated⁸.

CONCLUSION

Inguinal Hernia is predominantly seen in males at the mean age group of 51.5 ± 7.19 years, ranging from 12 to 82 years. Etiologically overweight patients are at risk. In case of obstructed Inguinal Hernia the most common presenting symptoms are pain and irreducible swelling, observed in all patients. The indirect hernia is more common than Direct Hernia and the small intestine is the most common hernial content. Herniorrhaphy was the most common treatment modality in case of obstructed Inguinal Hernia. Among the Post operative complications, most common one is wound infection. Future studies with longer follow-ups are required to assess recurrence rates in these patients. Multicentric studies are required in future to make the results more generalizable.

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