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Original Research Article

Clinical spectrum of obstructed inguinal hernia and its clinical outcome

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ABSTRACT

Background: Obstructed inguinal hernia is an emergency surgical condition the world over. The study was aimed to study the clinical spectrum of obstructed inguinal hernia and its management.
Methods: This cross-sectional study was conducted at Department of General Surgery, Janaki Medical College and Teaching Hospital, Janakpur, Nepal. In this study, we included all cases, aged above 12 years, with obstructed inguinal hernia admitted in our department. Excluded cases were patients suffering from comorbid conditions predisposing to development of groin hernia and those who were unfit to undergo surgical intervention.
Results: During the study duration, we included 60 consecutive patients fulfilling the study criteria. Mean age of the patients was 49.5±6.24 years, ranging from 12 to 78 years. The most common presenting symptoms were pain and irreducible swelling, observed in all patients. The onset of symptoms was less than 6 hours in 58% of the patients. The most common contents of the hernial sac was small intestine (47%). Herniorrhaphy was done in 73%. In our study, post-operatively there were wound infections in 5% cases, seroma in 4%, post-operative hematoma in 3% and paralytic ileus was present in one case. At 30 days post-operatively, one cases died (2%).
Conclusions: Obstructed inguinal hernias continue to be a source of morbidity and mortality in Nepal. Wound infection rate was 6% and one case expired in the 30 day follow up period.

Keywords: Hernia, Prognosis, Mortality, Outcome, Swelling

INTRODUCTION

An abnormal protrusion of intra-abdominal tissue via a fascial gap in the groin is known as an inguinal hernia. Blood flow may not be hampered at first when a section of the intestine inside the hernia sac gets clogged. In this instance, the inguinal hernia becomes strangulated and the contents of the sac gangrene.[1] A strangulated inguinal hernia is a potentially fatal ailment that has to be surgically repaired right away.[2] Prior to the development of anesthesia, the major historical cause of minor intestinal obstruction was "adhesive bands," which were well-known as a cause of intestinal blockage.

Among patients with inguinal hernia, about 5%-15% undergo emergency surgery because of complications.[3] As one of the most common acute abdominal illnesses, incarcerated inguinal hernias (IIH) need emergency surgery for the majority of its patients. In India, the most prevalent cause of intestinal blockage is obstructed hernias; in the west, the reason is adhesions. Even while it usually seems harmless, complex cases have the potential to be fatal.[4]

In a recent study, it was found that 12.7% had complications, of which 50% presented with features of intestinal obstruction, irreducibility, and strangulation.[5] The most frequently encountered complications are incarceration and strangulation. An incarcerated hernia is a hernia in which the content has become irreducible due to a narrow opening in the abdominal wall or due to adhesions between the content and the hernia sac. Moreover, intestinal obstruction may complicate an incarcerated hernia. A strangulated hernia occurs when

the blood supply to the contents of the hernia (e.g. omentum, bowel) is compromised. The benchmarks against which a successful hernia surgery are recurrence rate, rate of complications, simplicity to be performed by surgeons in training, low cost and time taken to return to normal activities. In the setting of bowel incarceration, if there is no ischemia and no need for resection, use of permanent mesh is still relatively safe.[6] Earlier, in complicated hernias with obstruction, the use of mesh is presumed to further increase the risk of infections, but recent publications show that the mesh is safe and it does not increase infection risk.

In present study we aimed to assess the outcomes and complications of managing cases of obstructed inguinal hernia in our department.

METHODS

Study design and sampling

We conducted a prospective observational study in the Department of General Surgery, Janaki Medical College and Teaching Hospital, Janakpur, Nepal, in which we included all cases aged above 12 years, with obstructed inguinal hernia admitted in in our department. Patients suffering from co-morbid conditions predisposing to development of groin hernia. e.g., collagen vascular diseases, Ehler Danlos, chronic obstructive pulmonary disease, ascites and patients unfit to undergo surgical intervention were excluded from the study. The sample size was calculated using following formulae: $N=(Z_{\alpha/2})^2 *(PQ) / E^2$**,** where N=Sample size**,** $Z_{\alpha/2}$ = Z value at 5% error (1.96)**,** P=Taken as 36% (prevalence of obstructed inguinal hernia)**,** Q=1-P**,** E=Allowable error (taken as 15%)**.** $N=(1.96)^2 * (0.36*0.64)/(0.15)^2$**,** N=39.33 During the study duration, we included 60 consecutive patients fulfilling the study criteria.

Operative technique

Ultrasound abdomen and chest X-ray, X-ray abdomen erect were done to confirm the diagnosis of obstructed hernia. After complete workup, clinical diagnosis was ascertained and patients underwent emergency inguinal hernia repair. Cases with inguinal hernias which had signs of obstruction and inability to reduce the hernia are taken up for emergency surgical intervention within 6-8 hours. All cases were performed under spinal anesthesia except for one case in which surgical intervention was done under general anesthesia, the indication being, haemodynamic instability. Modified Bassini's repair with mesh fixation was performed in 20% of the cases whereas herniorrhaphy was done in 73% cases and herniorrhaphy along with resection and anastomosis was done in 4 cases. The contents were examined for viability. The patient was nursed in bed on the day of operation. They were mobilized to walk the next day. Drain was removed after 48 hours. Chest physiotherapy was given. Antibiotics were administered for the period of hospital stay and Foley's catheter was removed after 3 days, to prevent contamination of wound and dressing. The cord was routinely palpated until the patient was discharged.

Data collection and data analysis

Data were collected using a pre-designed semi-structured study proforma. An obstructed inguinal hernia is defined as a protrusion, bulge, or projection of an organ or a part of an organ through the wall that containing it.

Obstructed hernia: This is an irreducible hernia containing intestine which is obstructed but there is no interference to the blood supply of the bowel.

Strangulated hernia: This is a hernia where the blood supply of its contents is seriously impaired rendering the contents ischemic due to a constriction that presses on them.

Irreducible hernia: Here the contents cannot be returned to the abdomen, but there is no evidence of other complications. It is usually, due to adhesions between the sac and its content, or from overcrowding within the sac.

At the time of diagnosis of the patient with inguinal hernia, the study investigator completed the detailed pretested, coded questionnaire of the patient, which included sociodemographic details (age, sex and occupation), clinical presentation (duration of hernia, side affected, extent, reasons for late presentation, type of hernia, whether primary or recurrence), past medical and surgical history, American Society of Anesthesiologists (ASA) class, type of surgical procedure, postoperative complications, the duration of hospital stay, and mortality. Data were then abstracted from the medical records regarding the complications and hospital stay.

Descriptive analysis of quantitative parameters was expressed as means and standard deviation. Ordinal data were expressed as absolute number and percentage. The descriptive analysis was done using Epi Info software.

Written informed consent was taken from all patients. No harm is intended for the subjects. The study procedure was explained to the participants before consenting. The participants were not subjected to any extra cost because of the study.

RESULTS

This cross-sectional study was conducted at Department of General Surgery, Janaki Medical College and Teaching Hospital, Janakpur, Nepal. In our study, mean age of the patients was 49.5±6.24 years, ranging from 12 to 78 years. It was observed that 38% of the patients were in the age group of 41 to 60 years. In addition, 90% of the patients were males. We observed that 45% were overweight and 34% were obese. Also, 35% were ASA

grade 2 and 15% were ASA grade 3. Based on the history obtained, it was found that 10% were current smokers, 15% consumed alcohol, 25% consumed both alcohol and smoked (Table 1). The most common presenting symptoms were pain and irreducible swelling, observed in all patients. Vomiting was reported by 57%, abdominal distension in 18%, dehydration in 13% and constipation by 12%. The onset of symptoms was less than 6 hours in 58% of the patients, 6 to 24 hours in 27% and more than 24 hours in 15% of the patients. In our study population, 38% had a direct hernia and rest had an indirect hernia. Right side was involved in 46% and left side was involved in the rest. The most common contents of the hernial sac was small intestine (47%) (Table 2). Herniorrhaphy was done in 73%, hernioplasty in 20% and resection and anastomosis with herniorrhaphy in 7% of the patients (Table 3). Post-operatively there were wound infections in 5% cases, seroma in 4%, post-operative hematoma in 3% and paralytic ileus was present in one case. At 30 days post-operatively, one cases died (2%).

Table 1: Baseline characteristics of the patients.

Variables	Frequency	Percentage (%)
Age group (years)		
12 to 20	9	15
21 to 40	14	23
41 to 60	23	38
61 to 80	14	23
Gender		
Male	54	90
Female	6	10
Body mass index (kg/m^2)		
Underweight (<18.5)	2	4
Ideal (18.5 to 23)	10	17
Overweight (23 to 27.5)	27	45
Obese (≥27.5)	20	34
ASA grade		
Grade I	30	50
Grade II	21	35
Grade III	9	15
Addiction history		
Smoking	6	10
Alcohol	9	15
Both alcohol and smoking	15	25
None	30	50
Past medical history		
Diabetes mellitus	15	25
Hypertension	17	28
Bronchial asthma	6	10
Cardiomyopathy	5	8
Total	60	100

Table 2: Clinical characteristics of the patients.

Variables	Frequency	Percentage (%)
Presenting symptoms		
Pain	60	100
Irreducible swelling	60	100
Vomiting	34	57
Abdominal distension	11	18
Dehydration	8	13
Constipation	7	12
Onset of symptoms to hospital (hour)		
Less than 6	35	58
6 to 24	16	27
More than 24	9	15
Type of hernia		
Direct inguinal hernia	23	38
Indirect inguinal hernia	37	62
Side		
Right	28	46
Left	32	54
Contents of hernial sac		
Omentum	10	17
Small intestine	28	47
Large intestine	18	30
Small intestine + omentum	4	6
Total	60	100

Table 3: Variables related to the surgery done and clinical outcomes.

Variables	Frequency	Percentage (%)
Surgical procedure		
Herniorrhaphy	44	73
Hernioplasty	12	20
Resection and anastomosis with herniorrhaphy	4	7
Duration of hospital stay (days)		
≤7	5	8
8 to 10	25	42
11 to 15	26	43
More than 15	4	7
Post-operative complications		
Wound infection	3	5
Seroma	2	4
Post-operative hematoma	2	3
Paralytic ileus	1	2
Mortality		
Yes	1	2
No	59	98
Total	60	100

DISCUSSION

One of the important factors responsible for undesirable outcome of the patients with incarcerated groin hernia is advanced age. In our study, mean age of the patients was 49.5±6.24 years, ranging from 12 to 78 years. Andrews defined that incarceration rate reached to peak incidence in the eighth decade.[7] Oishi et al, in their series, reported all mortalities over 68 years of age.[8] Kulah et al also observed that the advanced age completely affected strangulation rate, bowel resection requirement, hospital stay, morbidity, and mortality.[9] In the present study, the most common presenting symptoms were pain and irreducible swelling, observed in all patients. Vomiting was reported by 57%, abdominal distension in 18%, dehydration in 13% and constipation by 12%. In another study, Padmasree et al observed that pain was present in all most all the cases.[10] Pain was initially dragging type in nature. It was intermittent colicky type in 75% of cases could be due to intestinal obstruction. There was constant aching pain at the region of swelling in rest of the 25% of cases. Inguinoscrotal swelling was present in all cases. 30 cases presented with history of vomiting. The number of vomiting ranged from 2-10, they were projectile containing food particles in 80% cases and bile in 40% cases. Absolute constipation was present in 8 cases. The main duration of constipation is 1 to 3 days. In 22% of cases there was history of distension of abdomen, which gradually increased and associated with pain abdomen. Most common acute symptom in the study by Prasad et al was inguino-scrotal pain (66%) and others symptoms were vomiting (13%) and abdominal pain (27%). Locally tenderness was present in 2 cases.[11]

In the present study, 38% had a direct hernia and rest had an indirect hernia. Right side was involved in 46% and left side was involved in the rest. The most common contents of the hernial sac was small intestine (47%). Dasaratu et al observed that 59% patients were brought to their hospital within 6 hours of onset of symptoms.[12] Intraoperatively, indirect inguinal hernia (69%), left sided hernia (59%), irreducible hernia (39%) with small intestine content (65%) were most common findings. Mean duration of surgery was 65.1±23.5 minutes. Faridi et al observed that out of 94 patients included in the study 87 had indirect inguinal hernia and 07 patients had direct inguinal hernia.[13] There were 77 patients with obstruction & strangulation and the contents of sac were as follows: small intestine - 61 patients, Omentum - 04, transverse colon - 11, incarcerated vermiform appendix i.e. Amyand's hernia in 01 Patient. 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 transverse colon was present. Pre-operatively features of strangulation were present in 57 patients which gradually returned to normal after the obstruction was relieved. In the study by Padmasree et al, the obstruction was at internal inguinal rings in 43 cases, in inguinal canal in 3 cases and at superior inguinal ring in 7 cases.

In the present study, herniorrhaphy was done in 73%, hernioplasty in 20% and resection and anastomosis with herniorrhaphy in 7% of the patients. In a recent study by Dasaratu et al, hernioplasty with mesh repair was most common procedure, done in 52% 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%). In the study by Padmasree et al hernia contents replacement in abdomen with hernioplasty was done in 47.1%, release of adhesion with replacement of sac contents in 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 patients.

Post-operatively, it was observed that there were wound infections in 5% cases, seroma in 4%, post-operative hematoma in 3% and paralytic ileus was present in one case. We were not able to conduct a longer follow to assess for recurrence of hernia. Incidence of recurrent hernia after primary repair varies from 1% in specialized centres to 30% in general survey; most are within 2–3 years after primary repair.[14] Thus, mesh repairs seem to have lower recurrence rates even in emergency situations. 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 were not substantial, and the use of mesh did not appear to increase the incidence of infection or alter the incidence of superficial wound infection.[15] 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%). In the study by Faridi et al, incidence of wound infection was 5.3% (5 patients) which was managed conservatively. The incidence of seroma formation was 12.7% (12 patients) and this included 07 patients with irreducible inguinal hernia, it was also managed conservatively. None of the patients required mesh removal.

At 30 days post-operatively, one cases died (2%) in the present study. In the study by Faridi et al, one patient died. Dasaratu et al observed no mortality in their study. Padmasree et al reported that death occurred in 3.77% of obstructed inguinal hernia cases treated.[12,13]

There are a few limitations of this study. First, this was a single centre study. Thus, the results might not be generalizable to other surgical centres. Second, long term follow of the patients could not be done to assess for recurrence of hernia.

CONCLUSION

Obstructed inguinal hernias continue to be a source of morbidity and mortality in Nepal. The data regarding the clinical profile and outcomes of patients with obstructed

inguinal hernia is lacking from Janakpur. The most common presenting symptoms were pain and irreducible swelling, observed in all patients. Indirect hernia was more common and small intestine was the most common hernial content. Emergency hernia repair with mesh has satisfactory clinical outcomes. Future studies with longer follow ups are required to assess recurrence rates in these patients.

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