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Original Research Article

An observational study of clinical presentation and emergency surgical management of obstructed inguinal hernia repair

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ABSTRACT

Background: Inguinal hernias, one of the most causes of surgical admissions and referral of patients from primary physicians. Hernia is defined as protrusion of whole or a part of viscus through the wall that contains it. Strangulated hernia (irreducibility+obstruction+arrest of blood supply) is defined as a hernia in which blood supply of herniated viscus is constricted so much by swelling and congestion that it causes the arrest of its circulation.
Methods: The study carried out in 50 patients between August 2019 to December 2022 including patients having obstructed inguinal hernia presenting as emergencies/irreducible. Patients with obstructed hernia required emergency exploration through inguinal incision where on the basis of intraoperative presence of toxic fluid, mesh placement was decided.
Results: Total 50 patients were studied with the highest incidence at age 61-75, the most common site of obstruction was internal inguinal ring (n=42), most commonly presenting with symptoms of pain (n=50), swelling (n=50) followed by vomiting (n=29).
Conclusions: The right sided hernia was more commonly involved in obstruction at the level of the internal inguinal ring followed by superficial ring and mesh was kept according to the presence of toxic fluid. The most common procedure was posterior wall repair (n=31) with or without resection and anastomosis followed by meshplasty (n=19) where the complication were less observed with meshplasty (n=3) and highest complication were observed in posterior wall repair (n=9) with or without resection and anastomosis.

Keywords: Obstructed inguinal hernia, Strangulated hernia, Incarcerated hernia

INTRODUCTION

Inguinal hernias are one of the most causes of surgical admissions and referral of patients from primary physicians. Hernia is defined as a protrusion of a whole or a part of the viscus through the wall that contains it. A strangulated hernia (irreducibility+obstruction+arrest of blood supply) is defined as a hernia in which blood supply of a herniated viscus is constricted so much by swelling and congestion that it causes the arrest of its circulation. Incarcerated hernia is defined as hernia in which herniated viscus only causes the obstruction but does not interfere with blood supply of the viscus.[1]

Inguinal hernias account for 75% of abdominal wall hernias, with a lifetime risk of 27% in men and 3% in women.[2]

Inguinal hernias account for 80-83% of all hernias (59% indirect inguinal hernias, 25% direct inguinal hernias, 5% femoral hernias). The most common hernias in both genders are inguinal hernias; however, femoral hernias are reported to be more common in women than in men.[3-5] Patients with incarcerated abdominal wall hernia (AWH) (inguinal, femoral, umbilical, and incisional) are often seen in the emergency care unit, and such patients

commonly have painful localized swellings of the inguinal or abdominal regions.[6]

The small intestine, omentum, and colon are the most commonly herniated organs in incarcerated hernia9. Among the patients with incarcerated hernia, 5% to 13% had to undergo emergency surgery, and 10% to 15% required intestinal resection as a result of necrosis.[4] Despite advances in anesthesia, antisepsis, antibiotic therapy, and fluid therapy, the morbidity and mortality rates for such patients remain high.[10]

Patients with non-incarcerated hernias may be offered elective surgical repair based on their symptomatology. For patients with moderate to severe symptoms who are fit for surgery, surgical repair is indicated.[11] For an older patient with multiple comorbidities and a relatively asymptomatic hernia, a conservative approach with a close monitoring is the preferred choice; as such cases have low risk of strangulation.[12] For an acute presentation of incarcerated hernia sans bowel, manual reduction is preferred. Sedation may be necessary if tenderness is present. The patient should be supine, and Trendelenburg position often reduces incarcerated groin hernias. Gentle pressure on the hernia itself from all sides will help the hernia reduce intra-abdominally. Application of ice packs often relieves the acute inflammation of the hernias sac. An acutely incarcerated hernia with possibility of strangulation is an indication for an emergency surgery. Femoral hernias have a higher risk for incarceration and should be repaired immediately after its diagnosis to prevent complications. When a strangulated hernia is suspected, an urgent surgical consultation should be obtained. If bowel obstruction is present, consider placing a nasogastric tube for decompression and ensure that the patient has appropriate fluid resuscitation. If there is suspicion for bowel necrosis or perforation, broad-spectrum antibiotics should be started.[13]

The objective of the study was to assess clinical presentation, surgical modalities and complications after emergency inguinal hernia repair.

METHODS

Study setting

The study was conducted at Surat Muncipal Institute of Medical Education and Research (SMIMER).

Study design

A prospective observational study w conducted at the general surgery department.

Study subjects

All patients who underwent for obstructed inguinal hernia repair during study period were included in the study.

Inclusion criteria

Patients who have given informed consent; patients of all ages; and patients presented in emergency with obstructed inguinal hernia were included.

Exclusion criteria

Those who did not want to give written informed consent were excluded.

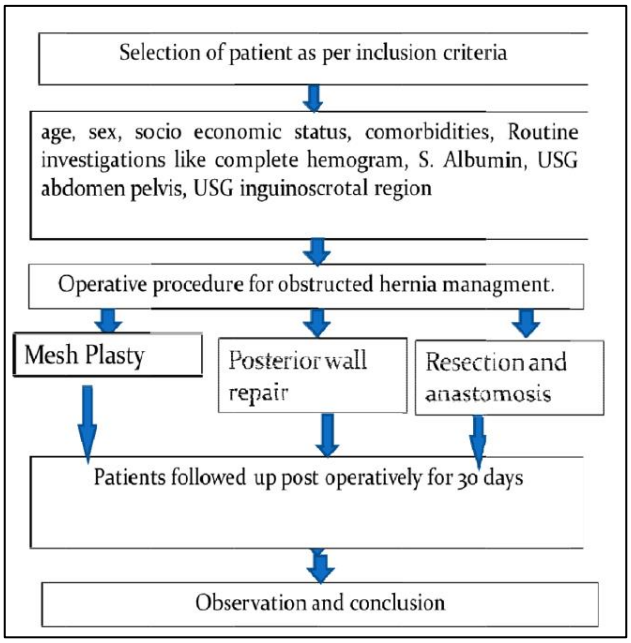

Figure 1: Study flow chart.

Sampling technique

The sampling technique used was convenient sampling.

Sample size

The study conducted has a sample size of 50.

Study period

The study was conducted from August 2019 to December 2022.

Data collection

Informed consent was obtained from all patients/patient's caretakers for the study. In all the patient's relevant information (detailed history with detailed clinical examination) was collected in a predesigned proforma.

Data analysis

Collected data was entered in the excel data sheet and data analysis was done with the help of Epi. Info. 7.2 software.

Statistical method

Data was cleaned, validated and analyzed by Epi. Info 7 software.

Descriptive statistics

For continuous variable range, mean and standard deviation were calculated and for categorical variables proportion and percentage were obtained.

Bi-variate analysis

Bi-variate analysis was done to know the association between dependent and independent variable Chi- square and student t test applied accordingly.

Ethical issue

The study was presented to Institutional Ethics Committee for ethical clearance. The IEC has permitted to carry out study and letter attached on page no. All the information collected was strictly used for study purpose and confidentiality was strictly maintained. This was also ensured to study participants before staring study.

RESULTS

Table 1 shows that 2%, 12%, 36%, 42%, 8% participants were belonged to age group 15-30, 31-45, 46-60, 61-75, >75 years respectively. Mean age was 62.5 years with 10.8 SD.

Table 1: Age distribution of study participants (n=50).

Age group (in years)	N	%
15-30	1	2
31-45	6	12
46-60	18	36
61-75	21	42
>75	4	8
Mean age±SD	60.6±13.8	

Table 2 shows that 84%, 2%, 6% participants had noted with internal inguinal ring, inguinal canal, superior inguinal ring site of obstruction respectively.

Table 3 shows that 100%, 100%, 58%, 40%, 16% participants had noted with clinical presentation like pain, swelling, vomiting, abdominal distension, constipation respectively.

Table 2: Site of obstruction of study participants (n=50).

Site of obstruction	N	%
Internal inguinal ring	42	84
Inguinal canal	2	4
Superior inguinal ring	6	12

Table 3: Clinical presentation of obstructed hernia of study participants (n=50).

Clinical presentations	N	%
Pain	50	100
Swelling	50	100
Vomiting	29	58
Abdominal distension	20	40
Constipation	8	16

Table 4: Clinical procedure done for obstructed hernia of study participants (n=50).

Clinical procedure	N	%
Hernia contentsreplacement in abdomen with meshplasty	19	38
Clearance of the toxic fluid and reduction of content and posterior wall repair	28	56
Bowel resection, end to end anastomosis with posterior wall repair	3	6

Table 5: Contents of the hernial sac of obstructed hernia noted in study participants (n==50).

Contents of the hernial sac	N	%
Small Bowel	27	54
Omentum	17	34
Caecum	3	6
Sigmoid colon	2	4
Urinary bladder	1	2

Table 6: Post-operative complication noted in study participants (n=50).

Complications	Type of surgery			
	Resection and anastomosis	Posterior wall repair	Meshplasty	Total N (%)
Leak	1	0	0	1 (2)
Post-operative seroma	0	5	0	5 (10)
Post-operative hematoma	0	0	1	1 (2)
Post-operative wound infection	0	2	2	4 (8)
Death	1	0	0	1 (2)

Table 4 shows that 38%, 56%, 6% study participants had treated with procedure like hernia contents replacement in abdomen with mesh plasty, clearance of the toxic fluid and reduction of content and posterior wall repair, bowel resection, end to end anastomosis with posterior wall repair respectively.

Table 5 shows that 54%, 34%, 6%, 4%, 2% participants had small bowel, omentum, caecum, sigmoid colon, urinary bladder contents of the hernial sac respectively.

Table 6 shows that post-operative complications like leak, post-operative seroma, post-operative, hematoma, post-operative, wound infection, respiratory disturbances, paresthesia, paralytic ileus, death were noted in 2%, 10%, 2%, 8%, 4%, 4%, 2%, 2% cases respectively.

DISCUSSION

The present prospective observational study conducted among 50 cases underwent for obstructed inguinal hernia repair at the general surgery department of tertiary care hospital, during August 2019 to December 2022 after ethical permission of IEC of institute. The aim of present study was to study the various modes of presentation, clinical features, diagnostic and therapeutic strategies and to evaluate the post-operative outcome in obstructed hernia surgeries. Inclusion criteria was patients who have given informed consent, patients of all age, patients presented in emergency with obstructed inguinal hernia.

A study done by Rantomalala et al and Ihedioha et al said that hernias are relatively innocuous disease in itself and they commonly present as uncomplicated reducible swellings operated in an elective setting, but sometimes their complications as irreducibility, obstruction and strangulation compel the patient to present to the emergency, and delay in presentation is known to result in high morbidity and mortality as well.[7,8]

A studied done by Ntakiyiruta et al Adesunkanmi et al Ngim et al Bushra et al noted the incidence of strangulated/incarcerated hernias in the range of 54 to 90% cases.[24-27]

Present study found that highest number of cases (42%) were noted in 61 to 75 years age group followed by 46 to 60 years (36%) and mean age was 62.5 years. These findings correlate with the study done by Padmasree et al Andrew et al.[16,28] A study done by Hernández-Irizarry et al observed that incidence of obstructed hernia in 44 to 53 years age group.[29] Shakya et al noted the mean age was 49 years.[17] Hancock et al found 66 years to be the average age.[30] McEntee et al found a peak incidence for strangulation in the eighth decade.[31]

Present study found that internal inguinal ring (84%) was the most common site of obstruction observed during study followed by superior inguinal ring (12%). Femoral hernias are known to complicate more common than inguinal hernias, probably due to the anatomical structure of the hernia rings through which the hernial sac passes. Femoral hernias have tight unyielding hernial rings whereas direct inguinal hernias have no well-defined hernial ring.[17]

Present study found that pain and swelling were reported in all the cases, after that vomiting (58%) was the most common clinical presentation followed by abdominal distension (40%).

Recurrent inguinal hernia is difficult to understand anatomically, and its repair is often challenging.[32] For recurrent incarcerated and strangulated hernias, the optimal treatment should be selected for each case, such as the details of previous surgery, skill level of the practitioner, and general condition of the patient.[33] Present study found that the ‘clearance of the toxic fluid and reduction of content and posterior wall repair’ was the most common procedure performed to treat the obstructed hernia followed by ‘hernia contents replacement in abdomen with meshplasty’. These findings were comparable with the study done by Padmsree et al Eze et al.[16,34] A study done by Dai et al observed that 15.6% cases were treated by resection of necrotic bowel and anastomosis and 67.2% were treated by open tension-free herniorrhaphy with polypropylene mesh, 32.8% treated by herniorrhaphy without mesh.[21]

The nature of contents of a complicated hernial sac is important in two respects: the anatomical structure involved and its viability.[17] Present study found that most common content of hernial sac was small bowel (54%) followed by omentum (34%). These findings are comparable with the study done by Padmsree et al Goyal et al Bekoe et al Shakya et al Andrews et al Amos et al.[35-37] A study done by Bessa et al Venara et al, Kurt et al Hentati et al Wysocki et al Sawayama et al Derici et al concluded that synthetic mesh could be safely and effectively used in patients with incarcerated or strangulated inguinal hernia, which significantly reduced the risk of hernia recurrence but did not increase the opportunity of surgical site infection.[14,15,19,20,37,38]

Cases operated by ‘resection and anastomosis’ had reported 1 case with leak, 1 case with respiratory disturbances. Cases operated by ‘posterior wall repair’ had reported 5 cases with ‘seroma’, 2 cases with infection, 1 case with respiratory disturbance, 1 case with paresthesia and 1 case with paralytic ileus. Cases operated by ‘meshplasty’ had reported 1 case with ‘hematoma’, 2 cases with infection, 1 case with paresthesia. Present study found that post-operative seroma was the most common complication noted among study cases followed by wound infection. Highest number of post-operative complications had noted in ‘posterior wall repair’ procedure. These findings are comparable with the study done by Padmsree et al Dunne et al Azari et al.[16,39,40] A study done by Dai et al53 observed the overall postoperative complication rate was

40%, with an incisional complication rate of 31% and an infection rate of 6%.[40] They had noted the reoccurrence rate was 7.8% and mortality rate was almost same. A study done by Bessa et al Derici et al Kurt et al observed the post-operative complication rate was in the range 21% to 39% and mortality rate was in the range 4 to 5%.[14,15,19]

Limitation

The recurrent obstructed inguinal hernia was not evulated in the study and the study cannot evaluate the mesh placment in the presence of toxic fluid due to mesh infection and fistula formation.

CONCLUSION

Highest number of cases (42%) were noted in 61 to 75 years age group followed by 46 to 60 years (36%) and mean age was 62.5 years. Male: female ratio was 1:0. Seventy-eight (78%) study participants had noted with right side hernia and 22% had left side. Internal inguinal ring (84%) was the most common site of obstruction observed during study followed by superior inguinal ring (12%). Almost half of the participants (46%) were reported to hospital within 24 hours of duration. Almost 8% cases had took more than 3 days to report in hospital and remaining had reported with 24 to 72 hours. Pain and swelling were reported in all the cases, after that vomiting (58%) was the most common clinical presentation followed by abdominal distension (40%). Almost 3/5th cases (62%) had a sudden onset of obstruction and remaining had gradual onset. The 'clearance of the toxic fluid and reduction of content and posterior wall repair' was the most common procedure performed to treat the obstructed hernia followed by 'hernia contents replacement in abdomen with meshplasty. Most common content of hernial sac was small bowel (54%) followed by omentum (34%).

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