European Journal of Molecular & Clinical Medicine (EJMCM)
ISSN: 2515-8260 Volume 09, Issue 07, 2022

Original research article

A Study of Irreducible Hernia: Clinical Presentation and Management

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Abstract

Background: The anterior abdominal wall hernia is commonly encountered in surgical practice. When they present as complicated hernia, the complication, morbidity, and mortality are high even after standard protocol management. The present study was undertaken to assess the incidence of irreducible hernias presenting with complications, mode of clinical presentation and management of irreducible hernia.

Method: During the study period from May 2019 to Nov 2021, a total 53 clinically diagnosed case of irreducible hernia were studied which included groin hernia (66.6%) and anterior abdominal wall hernia [incisional hernia (22.6%), umbilical (1.88%), epigastric (1.88%), paraumbilical (3.9%)]**.**

Results: The incidenceof irreducible hernia was 3.2% (1650/53). Duration of existing hernia was common in 86.7% cases after 1-year. Maximum cases (74.8%) presented within 24-hours of onset of symptoms. The commonest symptoms were irreducible swelling (100%) and pain (85%). Maximum (52.8%) cases presented with bowel obstruction as complication. Cause of irreducibility was neck of hernial sac (56%) and adhesions (43.4%). Commonest operative procedure was releaseof constriction (56.6%) and adhesiolysis (43.3%). 56.6% cases developed post-operative complications and surgical site infections (SSI) was the commonest one (33.9%). No recurrence found during the study period. 3(5.6%) patients were expired, 2 patients died because of septicaemia secondary to anastomosis leak and 1 case ARDS.

Conclusion: The present study clearly shows longer duration of existing hernia, existing co-morbidities, delay in operation in irreducible hernia is associated with definite complications and mortality. Hence, earlier hernia repair and not wasting crucial time when patient of irreducible hernia comes to hospital.

Keyword: Irreducible hernias; Groin; Bowel obstruction; Strangulation; Adhesiolysis; Recurrence; Septicaemia

Introduction

A hernia is a protrusion of a viscus or part of a viscus through an abnormal opening inthe walls of its containing cavity [1]. It is a common, treatable condition, if ignored can lead tolife-threatening complications. The complications of hernias are incarceration, strangulation, and bowel obstruction. The reasons for the simple hernia to go into complications are of manyfold including lack of health awareness, poverty, and lack of surgical facilities will lead to devastating complications. Therefore, evaluating the high-risk causes of the complicated hernia and its effective management is very important in clinical practice [2].

Hernia could be reducible or irreducible. Moreover, irreducible hernias could be obstructed or strangulated hernias or none of them [3]. An irreducible hernia also known as an incarcerated hernia, is a hernia that cannot be pushed back, manually, through the opening in the abdomen. An irreducible hernia is trapped outside the abdomen muscle wall. Although some irreducible hernias are not painful bulge under the skin can grow hard. There is also the risk that irreducible hernia becomes so swollen or inflamed that the opening in the abdomen wall begins to pinch the hernia, cutting off the blood circulation to the hernia [4, 5].

High recurrence rates are the most debatable problems in repair of incarcerated and strangulated hernias without mesh (5–21 %) and high wound infection rates (6–14 %) [6]. The rate of surgical site infection (SSI) following hernia repair using mesh ranges from 0% to 14%. In the cases of incarcerated or strangulated hernia repair, the infection rate may reach over 10% [7]. However, there are few studies claiming that use of mesh in irreducible hernia has relatively less complication in clear and clear contaminated wound. The hernia repair should follow the general principle for elective hernia repair. The need for study arises because, though the treatment of hernia is simple and can be done as a day care procedure, ignorance on the part of the patient and the lack of proper healthcare infrastructure in rural areas, might lead to complications like irreducibility, obstruction and strangulation, resulting in prolonged morbidity and might result in mortality too, which can be prevented if the patients presenting with hernia undergo treatment on an elective basis. The present study was intended to have a close look at the clinical presentation of groin hernias which have proceeded on to complications and the best possible way of successfully managing the case with a background aim of preventing the recurrence of disease.

Materials and Methods

After obtaining Institutional Ethical Committee approval and written informed consentfrom patients and relatives, this prospective and observational study was conducted in the Department of General Surgery at Tertiary Care Centre during a period from May 2019 to Nov 2021. A total 53 clinically diagnosed case of irreducible hernia (epigastric, inguinal, femoral, incisional, ventral irreducible hernia and complicated hernia) of all age groups getting admitted through surgical OPD or Casualty of our hospital were included and operated for irreducible hernia in various surgical units. Patients with primary reducible hernia and patient not willing for surgery were excluded from the study.

A detailed history regarding the duration of swelling, duration of irreducibility, history suggestive of obstructive and systemic disturbances were carefully elicited from the patients or their attenders. If the swelling was recurrent, history about the previous operative procedure was ascertained. Co-morbidity and any personal habits were noted. The patients' vitals were recorded with emphasis on mental status and degree of dehydration. Examination of swelling and subsequent abdominal examination to rule out obstruction and peritonitis. Patients were thoroughly screened for any predisposing factors by per rectal examination for stricture, prostatic enlargement (or) growth; abdomen examination for ascites; respiratory system examination for chronic respiratory tract infection. Those patients who were admitted to have

a irreducible hernia initially but become reducible on performing the manoeuvre of 'Taxis' were excluded from the study. Routine investigations like complete hemogram, blood sugar, urea, serum creatinine and electrolytes, HIV, HBsAG, Xray chest and ECG were done. Radiological investigations included plain erect x-ray abdomen to detect multiple air fluid levels was done in cases of suspected obstruction. Locoregional ultrasound to assess content of hernia and also regarding vascularity of the content.

Initial resuscitation of patients was carried out by keeping nil per oral with intravenous fluids, analgesics, prophylactic broad-spectrum antibiotics (cover both gram-negative and gram-positive organism) and nasogastric decompression (in patients with abdominal distension), and bladder catherization (to monitor urine output). The patients were taken for emergency hernia repair once the test results arrived. The choice of anaesthesia was influenced by the patient's general condition. Most of them were carried out in regional anaesthesia– spinal (5 cases) or epidural (45 cases) while few required general anaesthesia (3 cases). The choice of incision was depending on the type of groin hernia if the diagnosis was confident. The fundus of the hernia sac can then be approached and exposed, and an incision made to expose the contents of the sac. This was allowed determination of the viability of its contents. Hernia repair was followed using methods like Modified Bassini's, Mesh repair using nonabsorbable suture material viz 1-0 prolene. Drain was kept in flank in cases where resection anastomosis was done. Blood was transfused, whenever necessary.

Postoperatively, the patients were given parenteral intravenous fluids and Ryle's tube aspiration were continued. Antibiotics were given for 7 days and prolonged as per wound complication. Drains were removed on 3rd Post operative day when there were bowel sounds and minimal collection. Precipitating factors like cough, constipation was managed medically Patients were discharged on 3-5th POD while those with resection. Anastomosis was observed up to 10 days in the hospital. Follow up were taken on day 7,14 (suture removal), 28. Patients were advised for follow- up and also advised against lifting heavy objects for 3 months. Patients who had infection and presented late (24hrs) were having prolonged stay.

Observation and Results

During the study period from May 2019 to October 2021, total of 1650 hernia patientswere operated. Among them 53 patients (3.2%) with irreducible anterior abdominal wall hernia (external hernia) met the study criteria. The incidence of overall irreducible hernia was highest in 4^{th} and 5^{th} decade with 28% and 26% respectively. The mean age of patients was 49 years, ranged from 2 to 78 years with male predominance (77.4%) as shown in table 1.

Table 1: Age and sex wise distribution of Irreducible hernia

Demographic data		Number of cases	Percentage
Age group(in years)	1-10	01	2.0
	11-20	01	2.0
	21-30	05	9.0
	31-40	04	8.0
	41-50	15	28.0
	51-60	14	26.0
	61-70	09	17.0
	71-80	04	8.0
Sex	Male	41	77.4
	Female	12	22.6

The most common irreducible hernia was inguinal/groin hernia (66.6%) followed by incisional hernia (22.64%) as depicted in figure 1. Irreducible groin hernia was highest and commonly seen in 6th decade (25.7%) while incisional hernia in 4th decade (50%). Irreducblegroin hernia was highest and commonly seen in 6th decade (25.7%) while incisional hernia in4th decade. Irreducible groin hernia commonly seen in male with ratio of M:F 3.41:1 while incisional hernia was common in female M: F (1:5).

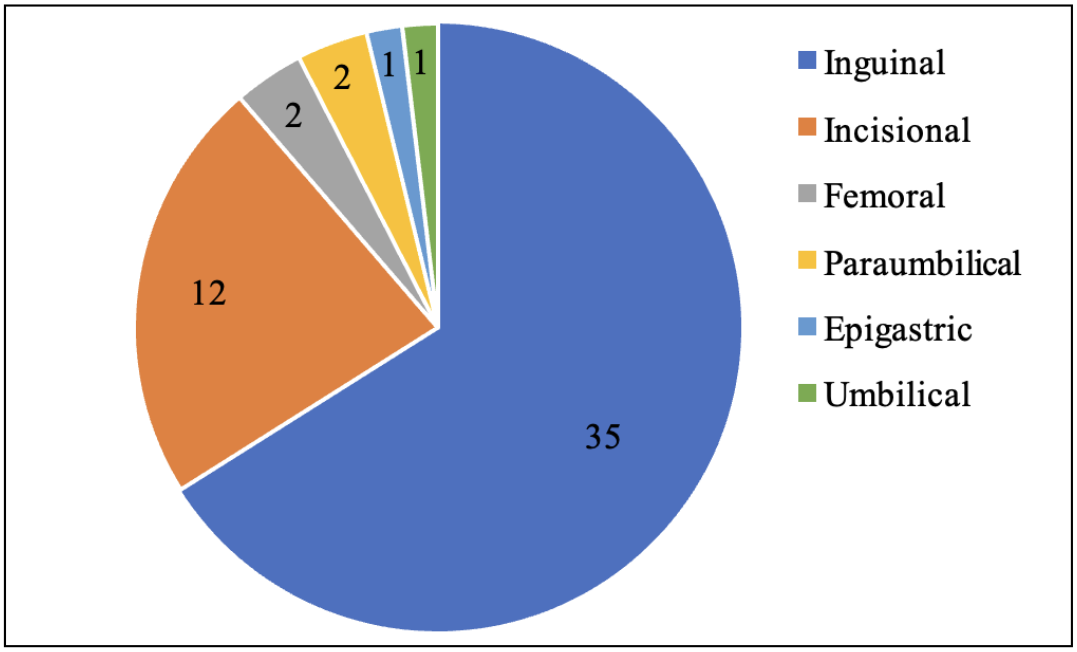


Figure 1: Different types of irreducible hernia

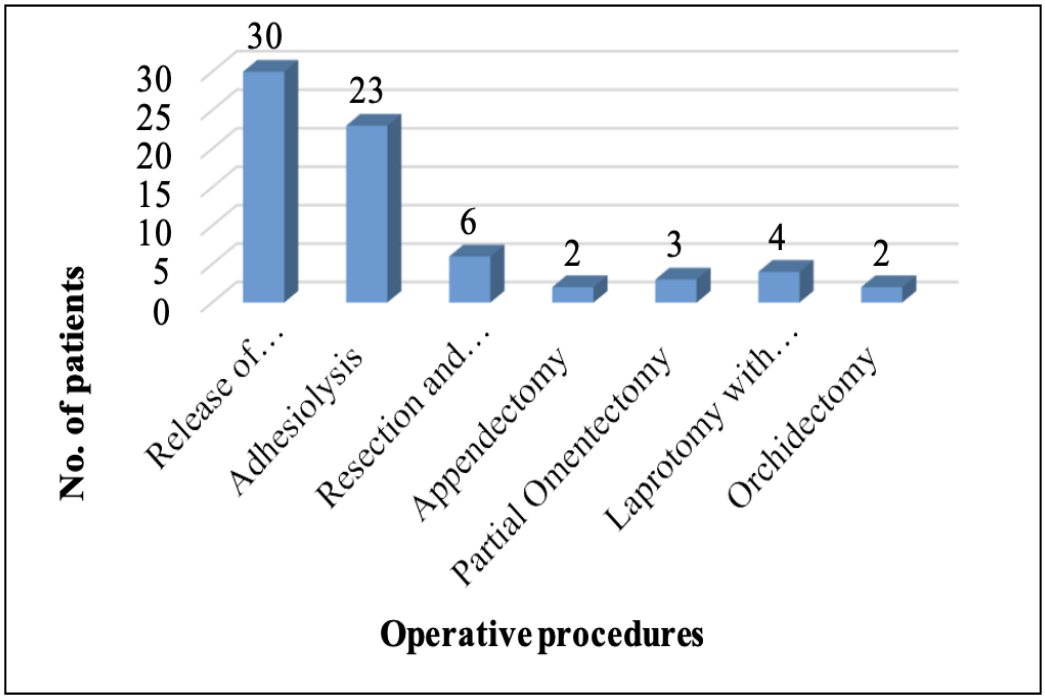
Duration of existing hernia was common in 86.7% cases after 1 year and majority 64% occur between 1–5 years of hernia. Majority of cases (74.8%) presented within 24 hours of onset of symptoms out of which 37.7% presented less than 12 hours. 52.8% of cases [37.7% inguinal, 11.3% incisional, 1.88% femoral, 1.88% umbilical] presented with clinical features of bowel obstruction. Considering the symptomatology, pain (85%) along with irreducible swelling (100%) were the commonest one. We found neck of hernia sac was the cause of irreducibility in majority of cases (56%). Commonest content of sac was bowel along with omentum 94.3%, (Table 2).

Table 2: Clinical presentation of irreducible hernia

Parameters		**Number of cases**	**Percentage**
Duration of Hernia	<1 Years	07	13.2
	1–5 Years	34	64.1
	5-10 Years	09	17.0
	10-15 Years	03	5.7
Duration of Irreducibility	<12 Hours	20	37.73
	12-24 Hours	20	37.73
	25-48 Hours	06	11.32
	>48 Hours	07	13.20
Complications of	Obstructed	28	52.8

irreducible hernia	Irreducible	15	28.0
	Strangulated	10	19.0
Presenting Symptom	Irreducible swelling	53	100
	Pain	45	84.9
	Features of intestinal obstruction	18	34.0
	Fever	7	13.2
Cause of irreducibility	Neck of hernia SAC	30	56.6
	Adhesions	23	43.4
Content of SAC	Small intestine only	20	38.0
	Omentum only	15	28.1
	Small intestine + Omentum together	15	28.1
	Caecum with appendix	1	1.9
	Appendix	1	1.9
	Sigmoid colon	1	1.9

The commonest operative procedure done was release of constriction at the neck ofhernial sac (30; 56.6%) followed by adhesiolysis (23; 43.3%) as depicted in figure 2.
Figure 2: Operative procedure done



In majority of cases 39 (73.58%) anatomical repair was done (includes Bassini's repair,Desarda repair and incisional hernia repair). Mesh repair was done in 13 cases (25%) as shownin table 3. In 35 cases of irreducible inguinal hernia Bassini's repair was done in 24 cases (68%) and Lichtenstein mesh repair done in 8 cases (22%).

Table 3: Method of hernia repair

Method of hernia repair		Number of cases	Percentage
Anatomical repair (n=13; 25%)	Incisional	10	19.2
	Umbilical	1	1.92
	epigastric	1	1.92
	paraumbilical	1	1.92
Mesh repair(n=13; 25%)	Inguinal	8	15.38
	Femoral	2	3.84
	Incisional	2	3.84
	paraumbilical	1	1.92
Bassini repair	Inguinal	23	42.08
Desarda repair	Inguinal	3	6.0
Herniotomy	Inguinal	1	1.92

Out of 53 cases, 30 (56.6%) developed immediate post-operative complication of which surgical site infection was commonest one seen in 18 cases (33.9%). Seroma formation was second most common complication seen in 9 cases (16.9%) as shown in table 4.

Table 4: Post-operative complications

Hernia	Repair	Seroma (n=9)	Haematoma (n=1)	SSI (n=18)	Leak (n=2)
Inguinal	Bassini repair	06	01	10	01
	Desarda repair	00	00	01	00
	Mesh repair	00	00	00	00
Incisional	Anatomical Repair	00	00	06	01
	Mesh repair	01	00	00	00
Femoral	Anatomical Repair	00	00	00	00
	Mesh repair	01	00	01	00
	Anatomical Repair	00	00	00	00
	Mesh repair	00	00	00	00
	Anatomical Repair	00	00	00	00
	Mesh repair	00	00	00	00
	Anatomical Repair	01	00	00	00
	Mesh repair	00	00	00	00

Duration of hospital stay was depicted in figure 3. The maximum duration of stay was 18 days with mean duration of hospital stay was 5.2 days.

Out of 53, 3 (5.6%) patients were expired in the post operative period; the cause was old age with co-morbidities, septicaemia secondary to anastomosis leak in 2 cases and 1 deathdue to acute respiratory distress syndrome and hepatic encephalopathy alcoholic liver cirrhosiswith co-morbidities of COPD, hypertension, and diabetes. All three cases were diabetic

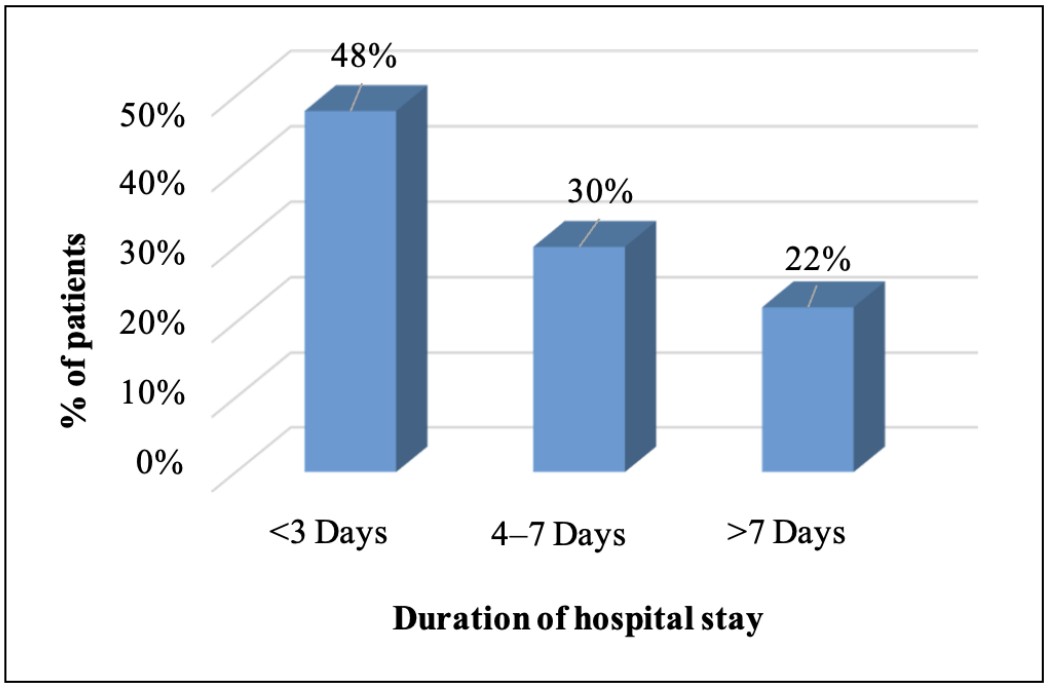


Figure 3: Duration of hospital stay

Discussion

In the present study, irreducible hernias occur in all age groups (2-78 years) but were more common in older age (41-60 years) with mean age of 49 years and show preponderance in males (77.4%). This is similar with the study conducted by Shakya V et al [8] and Kishore L et al [9]. The incidence of irreducible groin hernia was highest in age group of 61-70 years (25.7%) followed by 51-60 years (22.2%) and was seen only in males (96.23%) which is comparable with the previous studies [8-10]. Duration of existing hernia was common in 86.7% cases after 1-year and majority (64%) occur between 1–5 years of hernia. Average duration of existing hernia was 4.05 years, ranged from 3 months to 15 years. These findings are comparable with the study done by Prakash JS et al [11]. Majority of cases (74.8%) presented within 24 hours of onset of symptoms out of which 37.7% presented less than 12 hours. Males presented to hospital early compared to females before 12 hours of onset of irreducibility (13:7) and before 24 hours (4:1). Similar findings are reported in study done by Shakya et al [8].

52.8% cases presented with clinical features of bowel obstruction which is higher compared with findings of Shakya V et al (14.11%) [8], Kishore L et al (28.9%) [9] and Kulah et al (25.19%) [12]. However, 18.8% cases had strangulation as complication, this is consistent with findings of Kishore L et al (7.1%) and Kulah et al (13.5%) [12]. Simple irreducible hernia seen in 28% in present study. Groin hernia had obstruction in 56.7% cases and strangulated of groin hernia was seen in 16.2% cases which is consistent with findings of Prakash JS et al [11]. The most common presenting symptoms of complicated hernia were irreducible swelling (100%) followed by pain (85%). Cause of irreducibility was neck of hernial sac in 56% cases and adhesions in 43.4% cases. In groin hernia, neck of sac was cause of irreducibility in 60% and adhesions 40% while 75% cases had adhesion and 25% cases had neck of hernial sac as cause of irreducibility. The most common content of hernia sac was small intestine (38%)

which is consistent with earlier studies [8, 12]. While omentum was found second most common content (28%) which is consistent with. Kulah et al (27%) [12]. 15 cases (28%) were having both small intestine and omentum as content which is consistent with other studies [8, 9]. Hence in present study small bowel and omentum was content either in isolation or in combination 50 (94.3%).

Commonest operative procedure was release of constriction at the neck of hernia sac with adhesiolysis which is comparable with the study conducted by Hariprasad et al [13]. In majority of cases 39 (73.58%) anatomical repair was done (includes Bassini's repair, Desarda repair and incisional hernia repair). Mesh repair was done in 13 cases (24.5%). In this study herniotomy in 2-year-old patient 1 case (2.5%). These findings are correlated with the previous studies [8, 9, 12]. In present study, irreducible groin hernia Bassini's repair was done in 23 cases (65.7%). Decision of mesh repair or anatomical repair was decided based on intra operative findings such as presence of toxic fluids, strangulated bowel, dirty contaminated wound where placement of mesh was avoided.

Out of 53 cases, 30 patients (56.6%) developed immediate post operative complication of which SSI was commonest one seen in 18 cases (33.9%) which was high compared to other studies [8-11, 13], probably all these cases were operated in emergency operation theatre where other infected cases were also undergoing emergency surgery. Seroma formation was seen in 9 cases (16.9%). The incidence of hematoma formation in post-operative period was 1.8%, this is consistent with Padmasree et al [14]. Anastomosis leak occurred in 2 patients (3.7%)**.** Age of patient did not contribute towards SSI infection; SSI was common in males (11 cases) and in inguinal region (10 cases). Also, SSI was common when hernia symptoms were of longer duration for >1-year (20.7%). SSI was related to duration of irreducibility. Longer duration of surgery was definitely associated with higher incidence of SSI. SSI was related with content of sac i.e., cases with bowel as content 17 (32.07%) against omentum. SSI was associated in majority of cases when toxic fluid was present in sac 16 cases (30.18%). Opening of gastrointestinal tract was associated with SSI 9 cases (16.98%). Type of repair done after opening gastrointestinal tract necessitates different type of repair. Hence anatomical repair for incisional hernia and Bassini's repair of inguinal hernia was associated SSI 16 cases (30.18%). Strangulation, resection and anastomosis, anastomotic leak was contributing factor for SSI.

Around 24 cases (48%) were discharged within 3 days of admission. Patient who underwent resection and anastomosis, dirty contaminated wound was kept in hospital 4-7 days (15; 30%). while 11 cases (22%) were admitted for duration of more than 7 days likely due to immediate post-operative complications such as anastomosis leak, SSI, and co-morbidities. The average duration of hospital stay was 5.2 days while average duration of hospital stay in cases of post-operative complication was 8.5 days similar findings are seen in Kulah et al [12].

In the present study 3 patients (5.6%) expired in the post operative period findings are similar with Prakash JS et al [11] and Kulah et al [12]. Among groin hernia, 1 patient (2.7%) expired in post operative period same as Padmasree et al (3.77%) [14].

Conclusion

The present study clearly shows longer duration of existing hernia, existing co-morbidities, delay in operation in irreducible hernia is associated with definite complications and mortality. Hence, earlier hernia repair and not wasting crucial time when patient of irreducible hernia comes to hospital.

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