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Original Research Article

A study on groin hernias presenting as acute surgical emergencies in adults

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ABSTRACT

Background: Inguinal hernias form the commonest subgroup of various hernias; such common condition causes the problem of various complications. A minority of patients with a groin hernia present as an emergency, with a painful and irreducible mass or with intestinal obstruction and delay in presentation is known to result in high morbidity and mortality. Aim was to study about the various acute surgical emergencies in groin hernia with its complications and surgical treatments.
Methods: This study was a prospective observational study, conducted in the Department of General Surgery, Saveetha Medical College and Hospital, during March 2015 to February 2017. Thirty-five patients were included in the study. Ethical committee clearance was obtained prior to the commencement of study. All patients were studied from time of admission till discharge and followed up in out-patient department. A detailed history was elicited, and clinical examination was performed, and data recorded. All patients were given pre-and post-operative care.
Results: The incidence of hernia was 37.1% for age group of 60 to 69 years whereas it was 28.6% for age group of 50 to 59 years and incidence decreases there by as age decreases. The frequency of hernia in male (94.3%) was more when compared to female (5.7%). The duration of hernia frequency before acute episode was more in first year (54.3%). The right sided hernia was most complicated than left. The common site of constriction was deep inguinal ring than the superficial inguinal ring and femoral ring.
Conclusions: Majority of the patients underwent herniorraphy (82.8%). Most common site of constriction was observed to be at the deep ring (71.4%). The most common content was small bowel followed by omentum (74.3% and 25.7% respectively). Most of the patients did not have any post-operative complications (80%). Wound infection was the most common complication (11.5%) and mortality was observed in two patients (5.7%) and the causes of death were sepsis and acute respiratory distress syndrome.

Keywords: Herniorraphy, Inguinal hernia, Intestinal obstruction, Post-operative complications

INTRODUCTION

Hernia is defined as an abnormal protrusion of a whole or part of viscous through a normal or abnormal aperture in wall of the containing cavity. All weak spots in the abdominal wall are potential sites for hernias. Groin hernias (inguinal) form the commonest subgroup. Along with such common condition comes the problem of development of complications. A minority of patients with a groin hernia present as an emergency, with a painful and irreducible mass or with intestinal obstruction and delay in presentation is known to result in high morbidity and mortality as well. In groin hernias, the

complications encountered are irreducibility, obstruction with or without strangulation and inflammation of the contents of the sac as in Amayand's hernia where inflamed appendix is the content.[1] These complications are far more dangerous, troublesome and difficult to manage resulting in a dramatic increase in the morbidity and mortality of the disease in developing as well as developed countries. Trapped tissues and blood vessels can lead to irreversible necrosis within a few hours.[2] A study is directly needed which would clarify the pattern of complications that have been encountered in our institute and their magnitude.

Aim and objectives

To study about the various acute surgical emergencies in groin hernia, the age and sex incidence, types of hernia that present as acute emergency, the site of constriction ring, the side affected most, the various symptoms of presentation, the content of hernial sac, the duration of hernia to occurrence of complications, the type of surgery done, the immediate complications of surgery.

METHODS

This study was a prospective observational study, conducted in the Department of General Surgery, Saveetha Medical College and Hospital, during March 2015 to February 2017 (2 Years).

Inclusion criteria

- Age Group: 18 years or more
- All adult patients with groin hernia presenting with
  a) Pain + Irreducibility
  b) f/s/o intestinal obstruction (abdominal pain, abdominal distension, vomiting, constipation/ obstipation)
  c) Strangulation (f/s/o of peritonitis)
  d) Inflamed hernia (f/s/o intestinal obstruction with inflamed scrotal skin and extreme tenderness on palpation) were considered acute and included in the study.

Exclusion criteria

All pediatric population, i.e. less than 18 years of age.[3]

Thirty-five patients were included in the study. Informed consent was obtained from all patients or their attendees before or after surgery. Ethical committee clearance was obtained prior to the commencement of study. All patients were studied from time of admission till discharge and followed up in out-patient department. A detailed history was elicited, and clinical examination was performed, and data recorded. Hematological investigations and radiological investigations chest x-ray, abdomen erect x-ray and ultrasonogram of abdomen and scrotum were done. The surgical technique used was as follows:

Modified Bassini's repair technique

- Transversalis fascia is not opened
- Conjoint tendon is approximated with posterior free border of inguinal ligament with interrupted nylon sutures
- Deep ring is narrowed (Lytle's repair)
- Relaxing incision on the rectus sheath reduces tension in hernioplasty.

Patients who required resuscitation were adequately resuscitated initially. Resuscitation included bowel decompression, intravenous fluids to correct dehydration and electrolyte imbalance and ensures optimal urine output, followed by immediate surgery. All patients were given pre-operative antibiotics and the same was continued for 4 days post-operatively. The results of study were later analyzed and have been presented in this study.

RESULTS

The incidence of hernia was 37.1% for age group of 60 to 69 years whereas it was 28.6% for age group of 50 to 59 years and incidence decreases there by as age decreases. The frequency of hernia in male (94.3%) was more when compared to female (5.7%).

The duration of hernia frequency before acute episode was more in first year (54.3%). The right sided hernia was most complicated than left. The common site of constriction was deep inguinal ring than the superficial inguinal ring and femoral ring.

The incidence of symptoms is given in Table 1. Incidence of complicating hernia and coexisting medical illness is given in Figure 1 and 2.

Table 1: Incidence of symptoms.

Symptoms	Frequency	Percentage
Pain	35	100
Irreducibility	32	100
Vomiting	29	82.8
Abdominal distention	28	80
Constipation	26	74.3
Fever	9	25.7

The incidence of symptoms such as pain and irreducibility frequency were 35% and 32% respectively followed by vomiting and abdominal distention which was 29 % and 28%. Constipation was found in 26% and fever in 9%.

The incidence of complicated hernia includes obstruction caused by hernia was 63% whereas pain and irreducibility were 23% and strangulation of hernia contents was 14%.

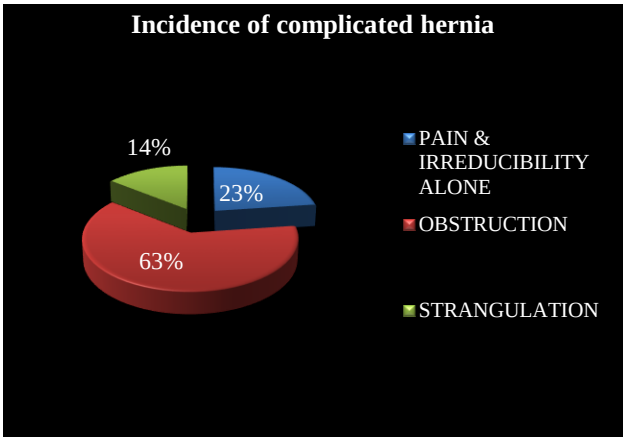

Figure 1: Incidence of complicated hernia.

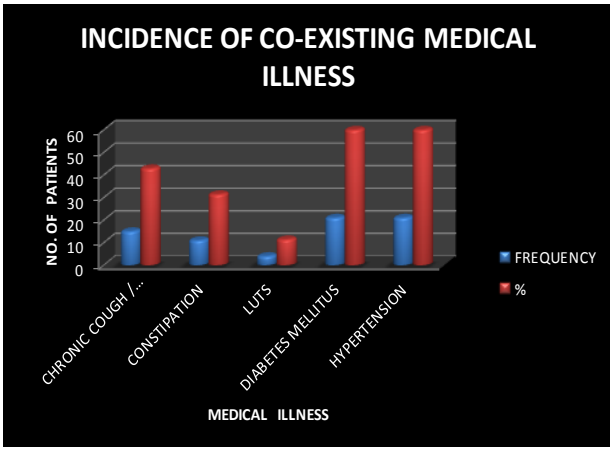

Figure 2: Incidence of complicated hernia.

The incidence of co-existing medical illness that was found in the patients with the inguinal hernia includes chronic cough, constipation, luts, diabetes and hypertension. The content of the hernia sac was small bowel (74.3%) whereas omentum (25.7%). The optimum procedure done was given in Table 2 and incidence of complications given in Table 3.

Table 2: Optimum procedure done.

Procedure	Frequency	Percentage
Herniorrhaphy only	29	82.8
+ Resection anastomosis	3	8.6
+ Omentectomy	3	8.6

The optimum procedure done for hernia were herniorrhaphy which was done in 29 cases whereas herniorrhaphy along with resection anastomosis was done in 3 cases and herniorrhaphy along with omentectomy was done in 3 cases. A 63-year-old male with 3 days h/s/o acute intestinal obstruction and left sided irreducible inguinal hernia, X-ray abdomen shows multiple air fluid levels and the content of sac is small bowel and is viable, showing Garrey's stricture.

Table 3: Incidence of post-operative complications.

Symptoms	Frequency	Percentage
No complication	28	80
Seroma	1	2.8
Wound Infection	4	11.5
Death	2	5.7
Total	35	100

The incidence of post-operative complications varies between 1% and 11.5% with the most common complication being wound infection which was 11.5%.

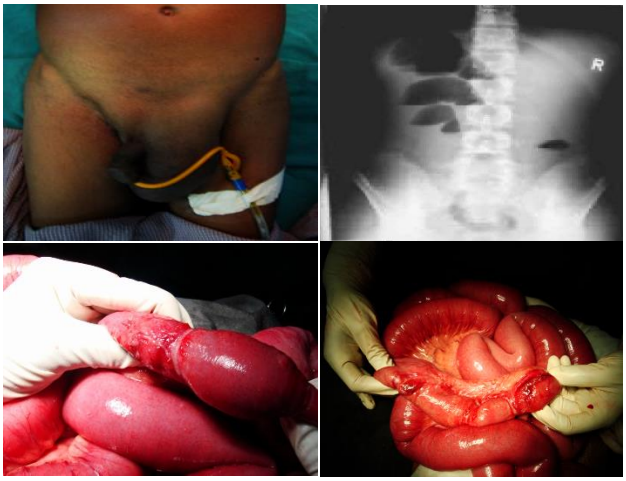

Figure 3: Left side irreducible inguinal hernia with intestinal obstruction.

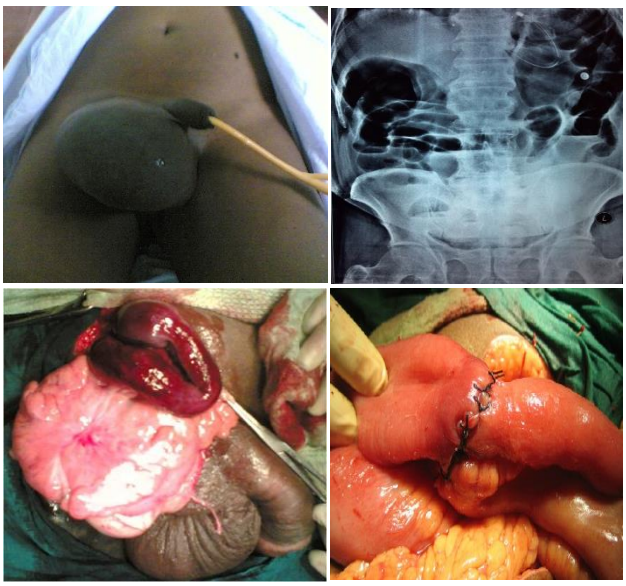

Figure 4: Right side irreducible inguinal hernia with intestinal obstruction.

A 72-year-old male with 2 days h/s/o acute intestinal obstruction and right sided irreducible inguinal hernia, X-ray abdomen shows multiple air fluid levels and content

of sac is small bowel and is gangrenous, following resection and anastomosis.

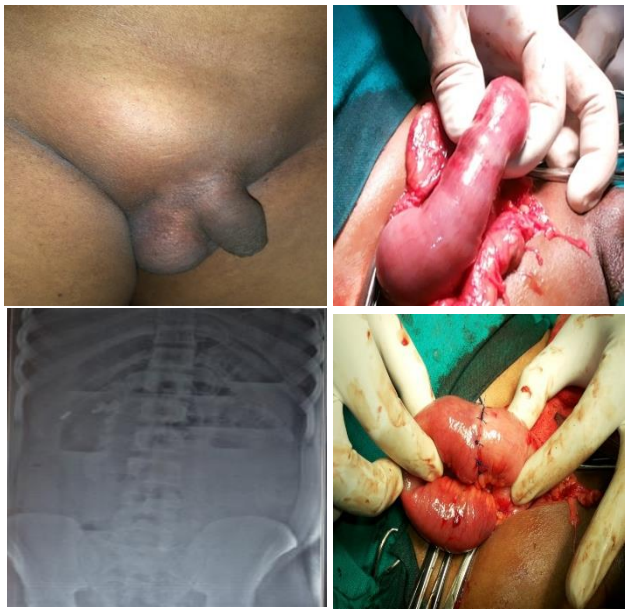

Figure 5: Right sided irreducible inguinal with gangrenous small bowel

A 66-year-old male with 2 days h/s/o acute intestinal obstruction and right sided irreducible inguinal hernia, X-ray abdomen shows multiple air fluid levels and content of sac is small bowel and is gangrenous, following resection and anastomosis.

DISCUSSION

Out of the 378 groin hernias in our study, treated in Saveetha Medical College and Hospital, 35 groin hernias presented acutely (9.3%). As per Paola et al, the incidence of emergency admissions in groin hernias is 10%.[4] In an extensive study conducted by Bay-Nielsen and colleagues, 4% of all groin hernia repairs were emergencies.[5] Majority of the patients with groin hernias who presented acutely in our study were between 60 and 70 years, with average age being 63 years. This concurs with many other studies conducted previously. In the present study the incidence is observed to be higher in males when compared to females, 94.3% in males and 5.7% in females. In standard literature, the incidence of acute groin hernias is higher in males than females, probably due to the higher incidence of groin hernias in males than females.[6] Andrews et al and McEntee et al reported that more men had complicated groin hernias than women.[7,8] In a study conducted by Shakya et al, also showed the incidence of acute groin hernias to be higher in males than females, 88.5% in males and 11.5% in females.[9] The present study is consistent with the previous studies. Because of anatomical differences between the genders, their susceptibility to the various types of hernia differs. The female pelvis is wider, and the angle between Cooper's ligament and the inguinal ligament is smaller than in men. Women have narrower Hesselbach's triangles and the round ligament, being a structure of smaller diameter than the spermatic cord, leaves the internal inguinal ring correspondingly narrower.[10] All of these factors are thought to lower women's susceptibility to groin hernias, but the musculo-aponeurotic attachments are such that women are proportionally more prone to develop femoral hernias.[12,13]

Mackenzie et al, stated that the relative frequency of strangulation is much higher in the femoral hernia than inguinal hernia, but due to large number of inguinal hernia, complications in them are observed much more frequently than any other type.[14] 50% of cases present as an emergency with very high risk of strangulation.[15] Femoral hernias pose a 10 times greater risk of strangulation or intestinal obstruction.[16,17] Femoral hernias are known to complicate more often than inguinal hernias, probably due to the anatomical structure of the hernia rings through which the hernia sac passes. Femoral hernias have tight unyielding hernial rings whereas direct inguinal hernias have no well-defined hernial ring.[9] In the present study, the incidence of complication in inguinal hernia is 9.2%. Gallegos et al, observed that incidence of complication in inguinal hernia is reported as 3 to 5 %.[18]

The proportion of femoral hernias presenting with strangulation averages 36% in 10 series compared with less than 10% of indirect inguinal hernias. Gallegos et al., 18 reviewed the records of 37 patients with femoral hernias, including 12 that were strangulated, calculating a cumulative probability of strangulation of 22% at 1 month and 45% (confidence interval 23 to 67%) at 21 months. These rates are strikingly higher than for inguinal hernias. In the present study, the incidence of acute femoral hernias presenting as strangulation is higher than the inguinal hernias (14.3% vs 9.2%).

In the present study, the incidence of acute hernia is higher in the first year (54.3%) following diagnosis and decreasing in frequency thereafter Table 1. As per Galleos et al, the risk of groin hernia to produce complication is maximum in first three months due to tight ring. Later yielding of ring increases so complication decreases.[18]

In the present study, the complications were more often with the right sided groin hernias when compared to left sided hernias, with a ratio of complications in right sided groin hernias to left sided groin hernias 4:1. Majority of our cases were right sided hernias, 80% right sided and 20% left sided hernias. Right sided hernia is more prone for complication than left sided hernias Figure 1. Most groin hernias occur on the right side whether complicated or simple, inguinal or femoral. The anatomical basis of this may lie in the attachment of the small bowel mesentery and so bowel loops attached to the right of the midline can more easily remain in the right groin than those attached to the left. [9] Right testis descends later than left testis. The predominance of right-sided femoral hernias is thought to be caused by the tamponading effect

of the sigmoid colon on the left femoral canal.[10] The present study is consistent with all studies mentioned above.

In the present study, all cases of inguinal hernias were indirect type. According to standard literature, deep ring is the most common site of constriction. In the present study also, constriction at the level of deep ring is more common than the external ring (71.4% vs 25.7%). Indirect hernias become most frequently complicated than direct hernias. The risk of strangulation for direct inguinal hernias is only about 10% of that for indirect hernias. In a study conducted by Frankau et al, 559 indirect hernias presented with complication s whereas only 14 direct hernias presented with complications. 19 Similarly in a study conducted by Williams et al, 43 indirect hernias presented with complications whereas only 5 direct hernias presented with complications. 20 In the present study, small bowel was the most common content in 74.3% followed by omentum in 25.7% patients.

Amos et al and Goyal et al reported small bowel as the most common content in inguinal hernias followed by omentum.[21,22] The nature of contents of a complicated hernial sac is important in two respects: the anatomical structure involved and its viability. They made a conclusion that a long duration of irreducibility (or a delay in the presentation of a groin hernia) significantly affected viability of contents. A study conducted by Shakya et al, revealed small bowel as the most common content of a hernia sac.[9] The present study is consistent with all the afore mentioned studies.

All 35 patients in our study underwent herniorraphy by Modified Bassini's repair technique, irrespective of the case being clean or contaminated, due to the higher incidence of subsequent wound infection. Various studies have postulated this type of management and our study is in agreement with the below mentioned studies. Rives et al, doubting the sterility of liquid, no matter how clear, contained in the hernia sac, counseled against the use of prosthetic materials. Pans et al, prohibited the automatic use of prosthetic material in the treatment of strangulated hernias, whether there was an intestinal resection or not.[23,24]

But according to the current concepts, hernioplasty could be performed in certain situations. Stoppa et al, proscribed the use of prostheses in strangulated hernias, and Stoppa and Warlaumont elaborated along the same lines: "The use of a prosthesis must be reserved for cases in whih the viability of the intestine is assured, where the operation takes place in an aseptic setting.[25,26] Wysocki A et al, opined that the use of monofilament polypropylene mesh in emergency hernia operations is safe, simple and effective as the incidence of mesh related complications were negligible in their series.[27] However, our study is not in agreement with the above-mentioned studies and we adopted the policy not to use prosthetic mesh and performed anatomical repair in all our patients (Table 2).

In the present study, post-operative complications were observed in 20% cases with the most common complication being wound infection in 11.4% patients, followed by death in 5.7% patients and seroma in 2.8% patients. Mortality was reported in 2 patients (Table 3). Both patients were males, between 60 and 69 years, presented with strangulation and gangrenous bowel, underwent resection anastamosis and herniorraphy, both hypertensive and diabetic. Mortality was due to sepsis in one patient and ARDS in another. According to John Jenkins et al, the incidence of post-operative complications varies between 1% and 7% with the most common complication being wound infection.[28] Shakya et al, reported an incidence of 33.33% with most common complication being wound infection in 12.69% patients.[9] McEntee et al, reported an overall incidence of post-operative complications as 19.6%.[8] The present study is consistent with the above-mentioned studies.

Adesunkanmi et al reported a mortality of 2.7% in their case series. John T Jenkins et al reported that acute groin surgery had a 7% mortality rate.[28,29] Andrews 22 found a mortality of 37% for complicated groin hernias. McEntee 8 and colleagues recorded an overall mortality of 10.4%. Nesterenko noted 13.4% mortality. Haapaniemi et al, reported a mortality rate of 7% in their series.[30,31] The present study is consistent with most of the above-mentioned studies.

Mortality was influenced by coexisting diseases and the viability of the hernia contents. This was consistent with a study by Dunphy, who suggested that old age with its associated medical problems was a major factor for the high death rate in complicated hernia.[32] McGugan E et al, reported that most deaths were in the elderly population with an ASA (American Association of Anaesthesiologists) grade of three and above.[33]

CONCLUSION

In this observational study conducted at Saveetha Medical College and Hospital, 35 cases of groin hernias that presented acutely were analyzed and following conclusion was arrived. In study period of 2 years, among the 378 groin hernias that were treated in the institution, 35 cases presented acutely (9.3%). The incidence was observed to be highest between 60 and 69 years, and the complication was more common in males than females. The incidence of complication was observed to be much higher in groin hernias of short duration and decreasing in frequency thereafter. Right sided groin hernias were commonly complicated than left sided groin hernias. Most of our cases presented as acute intestinal obstruction associated with diabetes mellitus and hypertension as the predominant co-existing medical illness. Pain and irreducibility were the chief presenting features in all patients followed by vomiting and

abdominal distension. The complications were more commonly observed in the older male patients with co-existing medical illness and short duration of hernia. Majority of our patients underwent herniorraphy (82.8%). Most common site of constriction was observed to be at the deep ring (71.4%). The most common content was small bowel followed by omentum (74.3% and 25.7% respectively). Most of the patients did not have any post-operative complications (80%). Wound infection was the most common complication (11.5%) and mortality was observed in two patients (5.7%) and the causes of death were sepsis and acute respiratory distress syndrome.

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