

## Management of Strangulated Inguinal Hernia in Adults

NAZIR AHMAD, SADAQAT ALI KHAN, KHALID JAVED ABID

**Aim:** To analyze the clinical presentation and factors affecting the outcome in the management of strangulated inguinal hernia in adults.

**Study Design:** The prospective study included 50 consecutive patients of strangulated inguinal hernia.

**Settings:** West Surgical Ward, Mayo Hospital, Lahore.

**Duration:** October 2011 to December 2013.

**Methods:** All the patients above 12 years of age either referred from the periphery or directly admitted in the Accident and Emergency Department, Mayo Hospital, Lahore with the diagnosis of strangulated inguinal hernia were included in the study. The symptoms and signs, factors for delayed presentation, peroperative findings and postoperative complications were recorded on the prescribed proforma.

**Results:** The mean age of the patients was  $50 \pm 21.3$  years, 49(98%) patients were men and only 1(2%) woman in the series. Right inguinal hernia was strangulated in 36(72%) patients and left in 14(28%). Irreducible inguinal swelling, absent cough impulse and localized tenderness were observed in 50(100%) and signs of intestinal obstruction in 33(66%) patients. The small gut alone or with omentum was the most frequent content of the hernial sac, found in 31(62%) patients. Resection and end-to-end anastomosis of ileum was performed in 16(32%) and partial omentectomy in 13(26%) patients. Open method herniorrhaphy was adopted in 44(88%) patients. No mesh was used in the series. The overall morbidity was 30% with no mortality in the study.

**Conclusion:** Elderly age, poverty, longer duration of symptoms, late hospitalization, gangrenous sac contents and significant concomitant medical illnesses are the major factors directly linked with unfavorable outcome of strangulated inguinal hernia in developing countries like Pakistan. Because of complications associated with emergency surgery in strangulation, the inguinal hernia should be repaired electively whenever possible.

**Keywords:** Inguinal hernia, strangulation, gangrenous hernial sac contents, herniorrhaphy, outcome.

---

### INTRODUCTION

A hernia is a protrusion of a viscus or part of a viscus through an abnormal opening of the walls of its containing cavity. It is a common condition affecting both men as well as women since the time immemorial. The earliest recorded description of an inguinal hernia was found in the Egyptian papyrus dating back to about 1500 BC.

Inguinal hernia is among the most common problems encountered by the surgeons and has significant complications. The worldwide prevalence of strangulated inguinal hernia is 0.3-2.9% of all inguinal hernias in adults<sup>1-2</sup>. Primary hernias strangulate more than recurrent and small hernias more than large hernias at a ratio of 5:1<sup>3</sup>. The risk of hernia strangulation is greater during the first 3 months of its appearance<sup>4</sup> and occurs at an average age of 69 years with no difference between genders. The right side is most affected (2:1). Indirect inguinal hernias become strangulated more than direct and femoral hernias, the latter are more frequent in females<sup>5</sup>.

It is generally agreed that a hernia should be electively repaired to avoid the complicated presentation<sup>6</sup>. Nevertheless, many patients remain undiagnosed or are reluctant to have surgical correction of hernia and as a result many emergency procedures are performed for complications of neglected hernia. Strangulated inguinal hernia is one of the common surgical emergencies dealt with by surgeons worldwide and it is one of the most common causes of intestinal obstruction in all age groups<sup>7</sup>.

Compared to simple hernias, the treatment of which has made a great progress in modern times, complicated hernias have been relatively neglected for the fear that their treatment may cause even greater risk to the patient than the hernia itself<sup>8</sup>.

### PATIENTS AND METHODS

From October 2011 to December 2013, 50 consecutive patients of strangulated inguinal hernia underwent emergency surgery who were admitted in the Accident and Emergency Department, Mayo Hospital, Lahore. It was assumed that every patient presenting to emergency with an obstructed inguinal

---

*Department of Surgery, King Edward Medical University/Mayo Hospital, Lahore, Pakistan.*

*Correspondence to: Dr Nazir Ahmad, Assistant Professor of Surgery. Email: na\_surgeon@yahoo.com*

hernia and new onset of pain had strangulation until proven otherwise<sup>9</sup>. On admission, all the patients were assessed thoroughly and data was prospectively collected on the prescribed proforma. Standard treatment protocols for resuscitation to correct metabolic abnormalities and preoperative preparation were followed strictly e.g. intravenous fluids, antibiotics, analgesia, nasogastric tube for decompression and foley catheter as necessary measures and continued postoperatively per needs. All the patients were advised Hb, white cell count, blood sugar, serum electrolytes, blood urea and creatinine but x-ray chest, ECG and x-ray abdomen erect/supine where indicated. Operative findings, viability of hernial sac contents and operative procedures were also recorded. Other parameters noted were postoperative recovery along with complications and hospital stay. The data was analyzed by SPSS 10.

**RESULTS**

During the study period, a total of 50 patients underwent emergency operations for strangulated inguinal hernia. The mean age of the patients was 50 ± 21.3 years, ranging from 21-74 years. There were 49(98%) male patients and 1(2%) female. The strangulation of small inguinal hernia (<8 cm) was found in 31(62%) and large (>8 cm) in 19(38%) patients. The right side was affected in 36(72%) patients and left in 14(28%). The time elapsed since the first symptoms appeared until the time of admission was quite variable from 4-180 hours with the mean of 32± 41 hours. Localized tenderness and absent cough impulse were seen in 50(100%) and dilated bowel loops on x-ray abdomen supine in 33 (66%) patients as in table 1.

Table 1: Clinical features of strangulated inguinal hernia

Symptoms and signs	n	%age
Irreducible swelling	50	100
Localized pain	50	100
Vomiting	39	78
Abdominal distension	22	44
Absolute constipation	20	40
Localized tenderness	50	100
Absent cough impulse	50	100
Abdominal tenderness	35	70
Dilated bowel loops	33	66
Absent bowel sounds	28	56
Multiple air fluid levels	25	50

Peroperatively, the most frequent content of the hernial sac encountered, was only ileum in 23(46%) patients and omentum in 12(24%) as in table 2

Table 2: Hernial sac contents with their viability status

Hernial sac content	n	Viable contents	Nonviable contents
Ileum	23(46%)	10(20%)	13(26%)
Omentum	12(24%)	4(8%)	8(16%)
Ileum with omentum	8(16%)	5(10%)	3(6%)
Colon	3(6%)	3(6%)	-
Colon with omentum	2(4%)	2(4%)	-
Appendix	2(4%)	2(4%)	-

Significant comorbidities were found in 16(32%) patients which included respiratory diseases in 8(16%), diabetes mellitus in 5(10%) and hypertension in 3(6%) patients. The viable contents of hernial sac or contents recovered their viability on hot fomentation and 100% oxygen inhalation were reduced into the peritoneal cavity while the resection was carried out for gangrenous contents. Resection and end-to-end anastomosis of ileum was performed in 16(32%) and Darn repair for hernia in 39(78%) patients as in table 3.

Table 3: Operative procedures for gangrenous hernial sac contents and inguinal hernia

Operative procedure	n	%age
Resection and anastomosis of ileum	16	32
Partial omentectomy	13	26
Orchidectomy	3	6
Darn repair	39	78
Obliteration of inguinal canal	6	12
Bassini repair	5	10

No mesh was placed in the series because of sterilization status in the emergency operation theatres. All the patients were keenly observed in the ward for postoperative recovery and earlier detection of complications and their prompt management. Respiratory tract infection was observed in 6(12%) and wound infection in 4(8%) patients as in table 4.

Table 4: Postoperative complications with management

Postop complication	n	Management
Respiratory tract infection	6(12%)	Conservative
Wound infection	4(8%)	Wound opened, culture sensitivity and dressings
Scrotal oedema	4(8%)	Conservative
Anastomotic leak	1(2%)	Laparotomy and ileostomy

The high morbidity was due to advanced age, poverty, longer duration of symptoms, late hospitalization, gangrenous contents of the sac, chronic respiratory diseases and diabetes mellitus. There was no mortality in the series. Hospital stay varied from 2-11 days with the mean of 2.7 days.

## DISCUSSION

Among inguinal hernia patients 95% present at clinics and only 5% present as an emergency with a painful irreducible hernia which may progress to strangulation and possible bowel infarction<sup>10</sup>. Management of the complicated inguinal hernia requires a precise diagnosis. It is important to define the degree of involvement of the sac contents. The morbidity and mortality of emergency inguinal hernia surgery is high and surgery needs to be performed rapidly in a well resuscitated patient with adequate postoperative high dependency or intensive care if necessary. The principals of surgery are the same as in an elective setting. Open surgery is performed when a hernia is irreducible or if there is any risk of bowel resection.

A simple hernia can strangulate at any time in life. In the series, the mean age of the patients was 50 years with male 98% and 2% female patients which are similar with the study reported by Eze JC<sup>11</sup> where the mean age of the patients was 50.5 years.

Small hernia strangulates more than large and right side more than the left. In the study, the strangulation of small inguinal hernia was found in 56% patients and right side was affected in 72% while 66% patients had signs of intestinal obstruction which is in comparison with the study carried out by Góngora-Gómez EM<sup>12</sup> where the small inguinal hernia was strangulated in 79% patients with affected right side in 55.8% and 90.7% patients had signs of intestinal obstruction.

The diagnosis of strangulated inguinal hernia is usually easier but there is not any useful connection between clinical findings and bowel viability, since the diagnosis of strangulation can be made only at the time of surgical exploration. In the series, resection and end-to-end anastomosis of ileum was performed in 32% patients and partial omentectomy in 26% with Darn and Bassini repair for hernia in 78% and 10% patients respectively which is in near resemblance with the study conducted by Abbas MH<sup>13</sup> where 28% patients underwent resection and end-to-end anastomosis of ileum, omentectomy in 26%, Darn repair for hernia in 70% and Bassini in 8% patients. Management of strangulated inguinal hernia is certainly not free from complications. In the study, the overall morbidity was 30% with no mortality showing better results than the study reported by Alvarez JA, et al<sup>14</sup> where the overall morbidity was 41.5% with mortality of 3.4%.

## CONCLUSION

Elderly age, unawareness about the complications of hernia, poverty, longer duration of symptoms, late hospitalization, gangrenous hernial sac contents and

major coexisting diseases have been associated with unfavorable outcome in the management of strangulated inguinal hernia in adults in developing countries. Complications following emergency inguinal hernia repair in adults is a serious problem and may make an easily treatable condition to a lethal one.

Health education programs for public awareness about hernia and its complications on television or in newspapers, by conducting seminars or delivering lectures especially at the periphery, earlier diagnosis and referral, appropriate preoperative resuscitation to correct metabolic derangements and excellent postoperative care will definitely reduce both morbidity as well as mortality for emergency surgery of strangulated inguinal hernia in adults in developing countries.

## REFERENCES

1. Kurt N, Oncet M, Ozkan Z, et al: Risk and outcome of bowel resection in patients with incarcerated groin hernias: retrospective study. *World J Surg* 2003; 27: 741-743.
2. Primates P, Goldacre MJ: Inguinal hernia repair: incidence of elective and emergency surgery; readmission and mortality. *Int J Epidemiol* 1996; 25: 835-889.
3. Góngora-gómez EM: Reparacion preperitoneal con malla y laparotomia en la hernia inguinal strangulada. *Cir Gen* 2005; 27: 31-36.
4. Gallegos NC, Dawson J, Jarvis M, et al: Risk of strangulation in groin hernias. *Br J Surg* 1991; 78: 1171-1173.
5. Rabuffat C, Galli A, Sealambra MS, et al: Laparoscopic repair of strangulated hernias. *Surg Endosc* 2006; 20: 131-134.
6. Oishi SN, Page CP, Schwesinger WH: Complicated presentation of groin hernias. *Am J Surg* 1991; 162: 568-571.
7. Foster NM, McGory ML, Zingmond DS, et al: Small bowel obstruction: a population based appraisal. *J Am Coll Surg* 2006; 203: 170-176.
8. Stoppa RE: The treatment of complicated groin and incisional hernia. *World J Surg* 1989; 13: 545-554.
9. Jones PF: Emergency abdominal surgery in infancy, childhood and adult life. 2<sup>nd</sup> ed 1987: 171-177.
10. Nixon SJ, Tulloh B: Abdominal wall, hernia and umbilicus. *Bailey and Love's Short Practice of Surgery*. 26<sup>th</sup> ed 2013: 948-969.
11. Eze JC: Obstructed inguinal hernia: role of technical aid program. *J Natl Med Assoc* 2004; 96: 850-852.
12. Góngora-Gómez EM: Strangulated inguinal hernia. *Cir Cir* 2012; 80: 331-341.
13. Abbas MH: Outcome of strangulated inguinal hernia. *Pak J Med Sci* 2005; 21: 445-450.
14. Alvarez JA, Baldonado RF, Bear IG, et al: Incarcerated groin hernias in adults: presentation and outcome. *Hernia* 2004; 8: 121-126.

