

## A DEMOGRAPHIC, CLINICAL AND SURGICAL STUDY OF OBSTRUCTED INGUINAL HERNIA

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### ABSTRACT

#### BACKGROUND

An obstructed inguinal hernia means the inguinal hernia is associated with intestinal obstruction due to occlusion of lumen of bowel. A distinguishing feature of strangulated hernia is the bowel's blood supply is not compromised. Intestinal obstruction is absent in case of omentocele, Richter's hernia and Littre's hernia. In this study, a sincere effort has been made to study and understand an obstructed inguinal hernia. This study is intended to help the practicing surgeon to understand the complications and to take necessary actions.

#### MATERIALS AND METHODS

- Eighty cases of obstructed inguinal hernia were studied between June 2009 to September 2011.
- This study has been conducted from the patients of Deccan College of Medical Sciences admitted during the above period.
- Out of 80 cases for follow up after discharge, 25 cases were reviewed.

#### RESULTS

- The incidence of obstruction in inguinal hernia is 7.9% in this study.
- Obstructed inguinal hernia is more common in age group 20-50 yrs. of age.
- It is 80 times more common in males. Male-to-female ratio is 79:1.
- There is right-sided preponderance. Obstruction occurs in ratio of 3:1 on right and left sides.

#### CONCLUSION

A study of common surgical emergency- obstructed inguinal hernia was presented. Anatomy, pathophysiology, aetiological factors, clinical features and complications were noted.

#### KEYWORDS

Hernia, Inguinal, Femoral, Incidence, Obstruction.

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#### BACKGROUND

It maybe said with assurance that inguinal hernia is among the oldest of man's maladies and one of the first to be recognised, so inescapable in its appearance and so tell-tale the discomfort.<sup>1</sup> The treatment of hernia, in particular inguinal hernia, which is the most common type of hernia that occurs in population has got drastic changes in the last 100 years.<sup>2</sup> In the period before Bassini started doing hernia surgery, the recurrence rate was 100% by 4 years. Now, it is <1%. Especially, the invasion of laparoscopy has changed the scenario. Laparoscopy is used in emergency inguinal surgeries also. Although, we have made a great progress in treating hernia, the management of its complications has made little. The postoperative complications mortality are alarmingly high, especially in the aged people in case of

strangulated inguinal hernia.<sup>3</sup> Obstructed inguinal hernia is one complication of inguinal hernia that precedes strangulation. If one could interfere at the stage of obstruction and treat it in correct time, we can avoid major morbidity and mortality. The present study has been selected for the above purpose.

The history of hernia surgery can best divided into early and late periods by Lister introduction of antisepsis in 1867. First record of hernia - [Greek hernios- (offshoot or bud)] was on store by ancient Greeks.<sup>4</sup> It was mentioned in Egyptian papyrus of 1500 B. G Celcus, Paul and Galen developed concepts of hernia, anatomy and treatment. Initially, pain is an indication of surgery. Taxis were recommended for strangulation. In middle ages, hernia was treated mainly by trusses. Royal stich, which encircled both sac and cord with a gold thread in an attempt to hold back viscera without sacrificing blood supply to the testicle was prevalent at that time. Franco, a barber surgeon<sup>5</sup> in Switzerland, recommended in the early stage of strangulation, cutting the constriction using a grooved director. Heister distinguished a direct from indirect inguinal hernia in 1793 de Gimbernat described his ligament and advocated its division in obstructed femoral hernia.

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Scarpa in 1814 described hernia-en-glissade (sliding). Astley Cooper<sup>6</sup> discovered transversalis fascia pointing; it is the main barrier of herniation. Morton described the conjoined tendon. Despite the understanding of hernial anatomy and introduction of anaesthesia in 1846, surgical repair made little progress in first half of 19th century. Severe sepsis and recurrence were complications at that time. On 12<sup>th</sup> August, 1865, Joseph Lister introduced antiseptic dressing in surgery. Marcy his pupil in 1871, published the original paper on antiseptic herniorrhaphy - A new use of carbolised catgut ligature. In 1876, Czerny, in Germany described pulling the sac down through the external ring and excising it. Lucas Championniere and Edoardo Bassini,<sup>7</sup> Italian surgeon, tried many radical procedures concluded that instead of obliterating the inguinal canal with deep suturing of rings, reconstructing it physiologically results in cure of hernia. The results were best to date. Bassins technique was adopted worldwide. Ruggi was the first to use Cooper's ligament in any type of hernial surgery. In 1897, George Lotheissen was the first to perform what is currently considered Cooper's ligament or McVay repair. The importance of iliopubic tract in the repair of post wall was demonstrated by Robert Condon, Henry Harkins and LM Nyhus<sup>8</sup> in 1984. Lichtenstein group popularised routine use of synthetic mesh and coined the term – tension-free hernioplasty. Nyhus removed the previous generations fear of infection and rejection. Further advancement is Prolene hernia system developed by Ethicon Company.

An obstructed inguinal hernia means the inguinal hernia is associated with intestinal obstruction due to occlusion of lumen of bowel. A distinguishing feature of strangulated hernia is the bowel's blood supply is not compromised. Intestinal obstruction is absent in case of omentocele, Richter's hernia and Littre's hernia.

Patients complain of vomiting, colicky pain abdomen, distension of abdomen, constipation, pain over the swelling may or may not present and fever may present in rare cases. In rare varieties of hernias like Richter's hernia, diarrhoea maybe the presenting feature. Classical signs of obstructed inguinal hernia; 1) Irreducibility, 2) No impulse on cough, 3) No tenderness over the swelling, 4) Sac is lax not tense, skin may lose rugosity. Consistency maybe elastic or doughy. Incarcerated hernias consistency maybe different where the content can be indented with the finger like putty. Dehydration is present in some cases. Per rectal examination ballooning of rectum is present.

X-ray erect abdomen, evidence of air fluid levels on a plain x-ray erect of abdomen confirmative of acute intestinal obstruction. Ultrasound abdomen will support x-ray findings. It also gives information about the presence of intraabdominal tumour or ascites. Complications include intestinal obstruction can produce shock due to hypovolemia, dehydration and electrolyte imbalances can occur, strangulation of contents leading to gangrene of the contents occurs. If bowel is the content it perforates either at the level of constriction or at the apex of loop. Toxic fluid

seeps into the sac and peritoneal cavity causing diffuse peritonitis.

In this study, a sincere effort has been made to study and understand an obstructed inguinal hernia. This study is intended to help the practicing surgeon to understand the complications and to take necessary actions.

**AIMS AND OBJECTIVES**

The present topic clinical case study of obstructed inguinal hernia is a common surgical emergency. The aim of the study is to know the incidence, various aetiological factors contributing to obstruction, the relative frequency of obstruction in other types of hernias, various clinical features that differentiate intestinal obstruction from strangulation are noted. Management including technique of posterior wall of inguinal canal repair, postoperative complications and recurrence rate are also presented in this study. A review of other methods of management and repair made.

**MATERIALS AND METHODS**

- Eighty cases of obstructed inguinal hernia were studied between June 2009 to September 2011.
- This study has been conducted from the patients of Deccan College of Medical Sciences admitted during the above period.
- Out of 80 cases for follow up after discharge ,25 cases were reviewed.
- More than half of the cases came for review.

**RESULTS**

**Incidence**

Total number of admissions in Deccan Medical College	46,264
Number of obstructed inguinal hernia cases	80
Percentage	0.18%

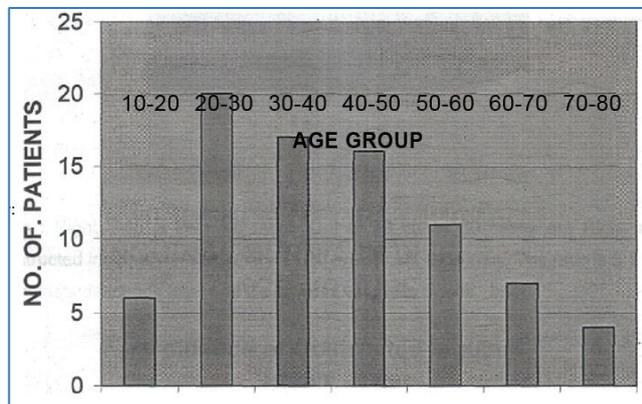
Total number of admissions in surgical wards	10,867
Number of obstructed inguinal hernia	80
Percentage	0.75%

**Age**

The case with least age is 13 yrs. and highest is 80 yrs. Most common age group is 20-50. Although, no age is exempt for obstructed inguinal hernia.

Hernia	Percentage of Incidence	Number	Percentage of Obstruction
Indirect inguinal	85	1025	7.9
Direct inguinal	4	48	0
Femoral	0.7	8	95
Ventral	3	36	6
Umbilical	0.08	1	100
Hiatal	0.08	1	0

**Aetiology**



*Incidence in Different Age Groups*

Aetiological Factor	Number of Cases	Percentage
Increased Intraabdominal Pressure	57	71.25%
Occupational Strain	45	56%
Local Weakness	22	27%
Congenital Sac	1	1.25%
Family History	3	3.75%

**CLINICAL FEATURES**

Mode of Onset-

- In 60% of cases, the mode of onset is sudden.
- Pain- present in all most all the cases. Pain is initially dragging type innature. It is intermittent colicky type in 75% of cases there is constantaching pain at the region of swelling in other cases. Colicky Pain isdue to intestinal obstruction.

**Vomitings**

Colicky Pain	75%
Dull Aching	25%

Vomitings	65% of cases
Number of Vomitings	2-1 per case
Bilious Vomitings	40%

**Constipation**

Constipation	37% of cases
Duration of Constipation	1-3 days

**Distension of Abdomen**

In 10% of cases, there is history of distension of abdomen, which is gradually increasing and associated with pain abdomen.

**Examination**

**1. Build and Nutrition**

Build and nutrition of the patient is moderate in all the cases studied. Obesity was not present. Pallor was present in 60% of cases.

**2. Associated Medical Diseases**

Hypertension was present in 15 cases. Chronic obstructive pulmonary diseases is present in 90% cases. Most of these cases are chronic smokers. Bronchial asthma was present in 1 case, for which, we used intraoperative nebulisation.

Hypertension	15 cases	18.7%
Chronic Obstructive Pulmonary Disease	72 cases	90%
Diabetis Mellitus	1 case	1.25%

**Site**

The site of the swelling is either in right or left inguinoscrotal region. In one case, no. 12, the swelling is confined to inguinal and root of scrotum. The shape is oval in all cases.

Right Side	60
Left Side	20

**Skin Over the Swelling**

There is loss of rugosity of swelling in 55% cases. Erythaema is present in 20 cases. The erythaema can be explained due to the presense of inflammation and toxic fluid in sac going into strangulation. Peristalsis over the swelling is present in only 6 cases.

**3. Expansile cough impulse- Absent in all the cases.**

**4. Abdominal distension is mild in 10% of cases.**

**5. Right testis is absent in 1 case.**

**Palpation**

Temperature is raised in 35% of cases. It is in comparision to the opposite side of scrotum. It is due to inflammation of the contents, which are going into state of stragulation. Tenderness is also present, which can be explained on the same basis of obstruction- Strangulation process. The swelling is above the inguinal ligament and above and meidal to pubic tubercle in all cases, a feature which distinguishes from femoral hernia. Impulse on coughing- Absent in all cases, a feature which is consistent in case of obstruction.

**Percussion over the Swelling**

Impaired note is present in 70% of cases, resonant in 20% of cases, dull in 10% of cases. The impaired note can be explained due to presence of bowel filled with fluid, resonant note in cases with bowel, which are empty or sliding cases like caecum, sigmoid colon, which are empty. Dull note is found in cases with omentum as contents.

Impaired Note	60% of cases
Resonant	12% of cases
Dull Note	28% of cases

**Irreducibility**

The patient is instructed to lie down on bed. The patient is asked to flex the thigh of affected side and adduct and rotate it internally, so the pillars of superficial inguinal ring and abdominal wall muscles get relaxed. The fundus of the sac is gently held and even pressure is applied to it to squeeze the contents towards abdomen. This is called 'taxis'. Irreducibility is said to be present when taxis is failed.

**Consistency**

Consistency is elastic in most of the cases where small bowel or large bowel is content. It is doughy in 1/3<sup>rd</sup> of cases.

Elastic	60%
Doughy	30%

**TREATMENT**

Surgery is the treatment of choice. But, initially we treated conservatively by giving Inj. Diazepam 10 mg IV stat slowly over 5 minutes and rising the foot of end of bed, so that the tone of abdominal wall muscle gets decreased and after a period of half an hour, taxis tried. When this option failed, we took the cases for emergency surgery.

**The aim is to-**

1. Save the contents going into strangulation by relieving obstruction.
2. Reduce the contents.
3. Repair of the inguinal canal to prevent recurrence.

So, all the cases are taken for surgery within 6-8 hrs. of obstruction.

**Preparation of Patient**

1. Intravenous line secured.
2. Blood samples were taken for routine surgical resuscitation done by giving crystalloid or colloid intravenous fluids. Ryles tube aspiration bladder catheterization done. X-ray erect abdomen taken. Cardiovascular efficiency assessed. The patient is shaved from the level of nipples up to knees. Savlon applied to the area.

**Anaesthesia**

Spinal anaesthesia was used in all cases except in one case in which general anaesthesia was used.

**Suture Materials**

Though there are many suture materials, No. 1 polypropylene suture was used in all cases. It was found to be superior than rest of materials like silk, Vicryl, PDS, etc.

**TECHNIQUE**

**Incision**

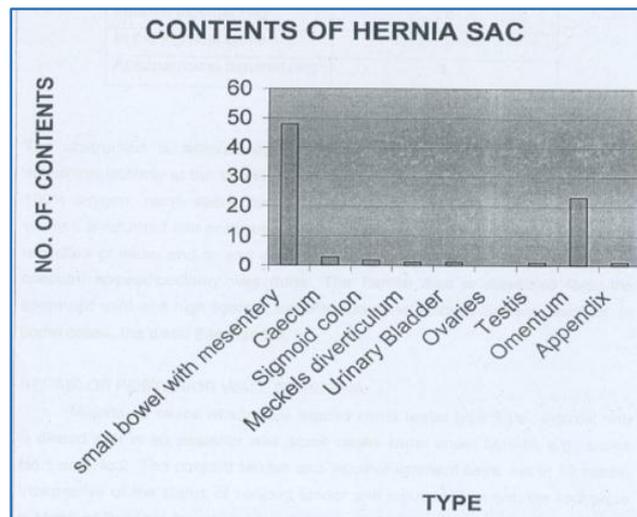
Inguinal scrotal incision is preferred in almost all cases. Inguinal incision is given in case where the size of swelling is small.

The incision start 1/2 inch above the medial two thirds of inguinal ligament and extending over the root of scrotum well away from the root of penis upto mid portion of scrotum. The incision gives access to the sac upto the fundus. So, it can be fully explored. The external oblique is cut in the line of fibres. Cremaster is cut. Sac identified. The fundus of the sac is applied a pair of straight artery forceps. The intervening tissue checked and an incision is given with No. 15 blade. The incision was extended with scissors, usually a toxic fluid came out. It is aspirated completely. The contents are examined for viability. Contents in our series by incidence wise.

Content	Number of Cases	Percentage
Small Bowel Mesentery	48	60%
Caecum	3	3.75%
Sigmoid Colon	2	2.5%
Meckel's Diverticulum	1	1.25%
Urinary Bladder	1	1.25%
Testis	1	1.25%
Omentum	23	28.75%
Appendix	1	1.25%
Ovaries and Fallopian Tube	0	

**The Hernial Sac**

The hernial sac is thickened in longstanding cases and the length averages from 5-10 cm.



**Contents of Hernia Sac**

**Site of Obstruction**

Internal inguinal ring	76
In the inguinal canal	3
At superficial inguinal ring	1

The obstruction is relieved by cutting the internal oblique and transverse abdominis laterally at the lateral border of the deep inguinal ring. Patient is given 100% oxygen, warm saline packs applied. After confirming that the bowel is viable, it is returned into peritoneal cavity. In case of Meckel's diverticulum, limited resection of ileum, end-to-end anastomosis done. In the case of appendix with caecum, appendicectomy was done. The hernial sac is dissected from the spermatic cord and high ligation transfixation done. Excess sac was excised. In some cases, the distal sac was left.

**REPAIR OF POSTERIOR WALL OF HERNIA**

Majority of cases, which were treated come under type II, i.e. internal ring is dilated with intact posterior wall. Some cases came under type III, e.g. cases No. 1 and No. 2. The conjoint tendon and inguinal ligament were lax in 15 cases. Irrespective of the status of conjoint tendon and inguinal ligament, the technique is modified Bassini for repair of posterior wall of inguinal canal.

The first bite was taken on pubic tubercle and then conjoint tendon and lateral border of rectus sheath. Subsequently, all other sutures include the inguinal ligament down and conjoint tendon above at different levels. The suturing is intermittent in manner with No. 1 Prolene on round bodied needle with 0.5 cm gap. Cord placed over the new posterior wall. External oblique layer closed over it with 2-0 chromic catgut with corrugated rubber tube drain. Skin closed with barbers thread. Aseptic dressing done. Scrotal T shaped bandaging done. No mesh is employed for repair of hernia.

**POSTOPERATIVE COMPLICATIONS**

The following indicate postoperative complications occurred in this series. Total cases studied 80.

Complication	No. of Cases	Percentage
1. Post – Operative cellulitis	8	3.75
2. Post – Operative Hematoma	2	2.5%
3. Post – Operative infection	2	1.5%
4. Post – Operative hydrocele	Nil	
5. Post – Operative atrophy of testis	Nil	
6. Respiratory disturbances	7	8.7%
7. Cardiovascular disturbances	Nil	
8. Neuralgia	8	2.5%

**RECURRENCE**

In this series of study of obstructed inguinal hernia, which the hernia repair was done by modified Bassini technique, after 2 years of follow up, no recurrence was observed.

**DISCUSSION**

When our study is compared with the other studies, the following data has been obtained.

	My Study	Obafemi Awolowo University, Nigeria	Ankara Teaching Hospital, Turkey
Age in Years	13-80	19-79	15-100
Sex: Male	79 Cases	81%	65%
Female	1 Case	13%	35%
Incidence of Obstruction	7.9%	15%	20.5%
Contents: Small Bowel	60%	58%	45%
Omentum	28.75%	32%	42%
Complications: Scrotal Oedema	3.75%	21%	15%
Wound Infection	1.5%	20%	6%
Recurrence	Nil	4%	6.2%
Mortality	Nil	3 in Number	12 in Number

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