

**ORIGINAL RESEARCH**

# To Study the Factors Associated with Strangulation in Groin Hernias in North Andhra

<sup>1</sup>Dr. Karuna Sudha Yarlagadda, <sup>2</sup>Dr. Akkidas Suvarchala, <sup>3</sup>Dr. Harini.K, <sup>4</sup>Dr. Kallepalli Vineel Sai Deepak, <sup>5</sup>Dr. M.Samanth

<sup>1</sup>Assistant Professor, <sup>2</sup>Associate Professor, Department of Surgery, Government Medical College, Srikakulam, Andhra Pradesh, India

<sup>3</sup>Assistant Professor, Department of Paediatric Surgery, Rangaraya Medical College, Kakinada, Andhra Pradesh, India

<sup>4</sup>Senior Resident, Department of General Surgery, MAMC, New Delhi, India

<sup>5</sup>Postgraduate, Department of Surgery, Government Medical College, Srikakulam, Andhra Pradesh, India

**Corresponding author**

Dr. Karuna Sudha Yarlagadda

Assistant Professor, Department of Surgery, Government Medical College, Srikakulam, Andhra Pradesh, India

**Email:** [dr.karunasudha@gmail.com](mailto:dr.karunasudha@gmail.com)

Received: 19 December, 2023

Accepted: 23 January, 2024

**ABSTRACT**

**Introduction:** A hernia is defined as an abnormal protrusion of an organ or tissue through a defect in its surrounding walls. Complications that develop in groin hernias such as irreducibility and obstruction with or without strangulation may make an easily treatable condition a life-threatening one. A strangulated hernia has compromised blood supply to its contents. Early admission and elective surgery can avoid significant morbidity. **Methods and materials:** This study was conducted at Government Medical College, Srikakulam & King George Hospital on twenty patients with strangulated inguinal hernias who presented to emergency department during the period of 18 months from June 2021 to December 2022. **Results:** Age, sex, and side of hernia was found to be a significant risk factor and predicted complications. Site of hernia was an important risk factor and adults with femoral hernia were most likely to experience complications. Duration of hernia for more than a year proved to be the most important risk factor. Most patients with complicated hernias had not presented earlier because patients had symptomatic treatment from the quacks and presented lately to emergency department with strangulation. Mortality was low while morbidity was affected by viability of contents of the hernial sac which in turn was directly affected by duration of irreducibility, delay in and contents of the sac. **Conclusion:** Risk factors that are causing complicated groin hernia are elderly age, male sex, right side of hernia, indirect inguinal more than direct inguinal hernia, femoral hernia, chronic duration, delayed and small bowel as contents are factors increasing the incidence of strangulation in groin hernias. Further large prospective studies are also recommended.

**Keywords:** groin hernia, strangulation, gangrene, herniorrhaphy

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution- Non Commercial- Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non- commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

**INTRODUCTION**

A hernia is defined as an abnormal protrusion of an organ or tissue through a defect in its surrounding walls. Complications that develop in groin hernias, such as irreducibility and obstruction with or without strangulation may make an easily treatable condition a life-threatening one. A strangulated hernia has compromised blood supply to its contents. Identification of risk factors that may predict development of complications would help place the patient in a high-risk group and can prevent fatal complications. In strangulation the small neck of the hernia obstructs venous drainage followed by the arterial blood flow to the contents of the sac and

causes congestion of the bowel wall, further dilatation of the bowel and fluid gets collected in the sac, bowel becomes dark with flabby and friable wall. Adhesions between the contents of the hernia and peritoneal lining of the sac can provide a tethering point that entraps the hernia contents and predisposes to strangulation.

**MATERIALS AND METHODS**

A prospective observational study was conducted at Government Medical College, Srikakulam & King George Hospital on twenty patients with strangulated inguinal hernias who presented to emergency department during the period

of 18 months from June 2021 to December 2022. All patients were submitted to complete history taking, physical examination, radiological work up and preoperative work up to diagnose as strangulated hernia. Clinical features are sudden severe pain, persisting vomiting, constipation, distension of abdomen. On examination hernia is tense, severely tender, irreducible and no expansile cough impulse with abdominal guarding or rigidity. Exclusion criteria are age <13 years and other complicated hernias are excluded. All the patients were followed up for 5 days in the hospital and then turned to regular visits at the outpatient clinic. The post operative

complications observed included superficial surgical site infections, wound dehiscence, and scrotal wall oedema. Ethical approval was obtained from the ethics committee.

### OBSERVATION AND RESULTS

A total Of 100 patients with groin hernias 20 strangulated groin hernias presented to emergency department were analyzed in the study. Of these 90% (18) were males and 10% (2) were females. This study includes patients between 13 years to 85 years of age. With the predominantly affected age group being 45-65 year constituting 75% of the total cases.

**Table -1 Age wise distribution of strangulated groin hernia**

Age	13-45yrs	45-65yrs	65-85yrs
No. of cases	3(15%)	15(75%)	2(10%)

Right sided groin hernias were more commonly encountered than left sided groin hernias which constituted 65% (13) and 35% (7) respectively. Of the total 20 strangulated groin hernias that were studied 90% (18) were inguinal hernias and 10% (2) were femoral hernias. Among these 18 cases of inguinal hernias indirect inguinal hernias constituted 94.5% (17) and direct inguinal hernias constituted 5.5% (1).

**Table- 2 Site wise distribution of cases**

Site of hernia	Inguinal hernia	Femoral hernia
No. Of cases	18(90%)	2(10%)

History of chronic duration for more than one year was present in 90% (18) of the total cases and history of acute duration of less than one year was present in 10% (2) of the cases.

**Table - 3 Distribution of cases according to type of inguinal hernias**

Type of hernia	Indirect Inguinal hernia	Direct inguinal hernia
No. Of cases	17 (94.5%)	1 (5.5%)

Intra-operatively small bowel was the content of hernia sac in 75% (15) of the cases where as omentum and large bowel constituted 20% (4) and 5% (1) of the sac contents respectively.

**Table - 4 Showing symptoms of strangulated hernia**

S.NO	Symptoms	No. Of patients	Percentage
1	Pain	20	100
2	Irreducible Groin Swelling	20	100
3	Vomiting	13	85
4	Constipation	8	40
5	Fever	18	90

The above table shows all the cases have pain& irreducible groin swelling

**Table - 5 Contents of the sac**

Contents of the sac	Small bowel	Omentum	Large bowel
No. of cases	15(75%)	4(20%)	1(5%)

**Table 6– As per intraoperative findings Viability of the contents**

Status of Contents	Contents		
	Bowel	Omentum	Total
Viable	4	3	7
Gangrenous	12	1	13
Total	15	5	20

It has been found that among the 20 patients who presented more than 24 hours after onset of symptoms 13 had gangrenous changes of bowel requiring resection compared to 7 patients who presented less than 24 hours where bowel remains viable as shown in **Table 7**

**Table -7 Showing duration of symptoms & clinical out come**

Time elapsed	Viable bowel (Not requiring resection)	Content requiring resection	Total
<24 Hrs.	3+1+3	Nil	7
>24 Hrs.	Nil	13(12+1)	13
TOTAL	7	13	20

## DISCUSSION

A hernia is defined as an abnormal protrusion of an organ or tissue through a defect in its surrounding walls. Complications that develop in groin hernias such as irreducibility and obstruction with or without strangulation may make an easily treatable condition a life-threatening one<sup>1</sup>. In incarcerated hernia sac and contents are densely adhered to each other always irreducible and obstructed but the blood supply to the contents is preserved. These adhesions become the tethering point that entraps the hernia contents and predisposes to strangulation.<sup>2</sup>

Strangulated hernia in which blood supply to the contents of the sac are seriously impaired following obstruction initially venous return is impaired that leads to congestion of the bowel which further causes full dilatation of the bowel and contents the fluid, eventually arterial blood supply is impaired causes gangrene of the bowel which may cause perforation and peritonitis<sup>6</sup>

Out of the 20 cases studied 75% patients fall under 45–65-year group 15% fall under 13–45-year group and only 10% patients were over 65 years of age. Old age increases with risk of strangulation and poor outcome. Old age patients with coexisting disease have poor outcome. 90% were inguinal hernias and 10% were femoral hernias which were observed in females only.<sup>3</sup>The male and female ratio (18:2) in the present study among the strangulated hernia which is comparable with the consistency of Hariprasad et al.

In this study all the twenty patients had symptoms of pain & irreducible groin swelling comparable with Manish Baria et al., & Prakash JS et al.

Groin hernias were more common probably because of the weakness of abdominal musculature in the groin and aponeurosis not covered by striated muscles in groin. Both femoral and inguinal hernias were more often on right side constituted 65% and 35% on left side. This is more likely due to developmental delay in closure of processus vaginalis after the normal slower descent of the right testis during fetal development than left side and the sigmoid colon on the left side which causes tamponade effect on the left femoral canal decreasing the likelihood of a left side defect.<sup>4</sup>The majority of the inguinal hernias were indirect hernias because the indirect hernias are formed because of patent processus vaginalis whereas direct inguinal hernia is caused when the floor of Hasselback triangle is weakened<sup>10</sup>.

In a study published by S.rai et al in 2007 it was observed that acute duration of hernia was a risk factor for strangulation however this study shows chronic duration to be a more common risk factor. Patients in remote areas treated by quacks and those with no access to health centers are the main reasons for chronicity of cases<sup>5</sup>. This study included a patient with strangulated groin hernia who was misdiagnosed as pyocele and operated by a quack later presented to us with small bowel perforation. After clinic radiological confirmation the strangulated inguinal hernias were operated by Bassini's herniorrhaphy and femoral hernias were operated by McEvedy-high operation and Lockwood-low operation<sup>7</sup>.

Out of the 20 operated strangulated groin hernia cases gangrenous bowel segment was resected and end to end anastomosis was done in 15 cases where as in 4 cases bowel regained its viability with 100% oxygen inhalation and hot saline mops. In a case of omentocele strangulated omentum was resected. Post operative complications observed were superficial surgical site infection in 10 cases which was managed by regular dressings, pus for culture and sensitivity, intravenous antibiotics, and glycemic control in diabetic patients<sup>8</sup>. Wound dehiscence was observed in an elderly patient with uncontrolled blood sugars. Scrotal wall edema was seen in 2 cases which were huge hernias and had chronic duration. Morbidity was high in elderly patients with comorbidities<sup>9</sup>.

## CONCLUSION

This study concluded that chronicity of duration due to various factors like lack of access to primary health care centers in the tribal population and treatment by quacks was the major reason for strangulation of groin hernias. Other risk factors including elderly age group, male population with right sided inguinal hernias.

## REFERENCES

1. Shirin Towfigh, Incarcerated Inguinal Hernias, *Emergency General Surgery*, 10.1007/978-3-319-96286-3\_33, (377-385), (2018).
2. Abdulmalik Altaf and Wafaa Ali Algethmi, Risk of bowel resection in patients with hernia, *Saudi Surgical Journal*, 10.4103/ssj.ssj\_44\_18, 7, 2, (43), (2019)
3. Aliasgher Khaku, Christopher S. Hollenbeak and David I. Soybel, Cost-conscious decisions in the timing of operation for minimally symptomatic inguinal hernias in male patients, *The American Journal of*

- Surgery*, 10.1016/j.amjsurg.2015.10.029, **211**, 6, (975-981), (2016)
4. Ursula Dahlstrand, Gabriel Sandblom, Staffan Wollert and Ulf Gunnarsson, Limited Potential for Prevention of Emergency Surgery for Femoral Hernia, *World Journal of Surgery*, 10.1007/s00268-014-2539-6, **38**, 8, (1931-1936), (2014).
  5. M. Koizumi, N. Sata, Y. Kaneda, K. Endo, H. Sasanuma, Y. Sakuma, M. Ota, A. T. Lefor and Y. Yasuda, Optimal timeline for emergency surgery in patients with strangulated groin hernias, *Hernia*, 10.1007/s10029-014-1219-7, **18**, 6, (845-848), (2014).
  6. Srinath S, Prashanth Hungund and Suma K.R, COMPLICATED GROIN HERNIAS- RISK FACTORS, CONSERVATIVE MANAGEMENT AND TIMING OF SURGICAL MANAGEMENT, *Journal of Evolution of Medical and Dental sciences*, 10.14260/jemds/1166, **2**, 34, (6502-6508), (2013).
  7. Mohamed E. Abd Ellatif, Ahmed Negm, Gamal Elmorsy, Mohammed Al-Katary, Abd El-Azeim M. Yousef and Ramadan Ellaithy, Feasibility of mesh repair for strangulated abdominal wall hernias, *International Journal of Surgery*, 10.1016/j.ijssu.2012.02.004, **10**, 3, (153-156), (2012).
  8. B. Romain, R. Chemaly, N. Meyer, C. Brigand, J. P. Steinmetz and S. Rohr, Prognostic factors of postoperative morbidity and mortality in strangulated groin hernia, *Hernia*, 10.1007/s10029-012-0937-y, **16**, 4, (405-410), (2012).
  9. Operation Compared with Watchful Waiting in Elderly Male Inguinal Hernia Patients: A Review and Data Analysis, *Journal of the American College of Surgeons*, 10.1016/j.jamcollsurg.2010.09.030, **212**, 2, (251-259.e4), (2011).
  10. B. van den Heuvel, B. J. Dwars, D. R. Klassen and H. J. Bonjer, Is surgical repair of an asymptomatic groin hernia appropriate? A review, *Hernia*, 10.1007/s10029-011-0796-y, **15**, 3, (251-259), (2011).