



E-ISSN: 2616-3470  
P-ISSN: 2616-3462  
© Surgery Science  
www.surgeryscience.com  
2019; 3(1): 197-200  
Received: 05-11-2018  
Accepted: 10-12-2018

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## Clinical profile of patients with inguinal hernia

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DOI: <https://doi.org/10.33545/surgery.2019.v3.i1.d.34>

### Abstract

There exists a familial tendency to groin herniation. A study of 280 families with congenital indirect inguinal hernias in China indicated that transmission was autosomal dominant with incomplete penetrance of a preferential paternal factor. The hernia usually occurred on right side, consistent with later descent of testes on that side. Such herniation which is more common with prematurity has been ascribed to a delay in maturation. This study was conducted from the patients admitted with the diagnosis of unilateral primary inguinal hernia in General Hospital and Hospital attached to Medical College. The diagnosis of unilateral primary inguinal hernia was made on basis of history of reducible groin swelling and essentially on clinical examination. The most common factor associated with inguinal hernia in both the groups was smoking accounting for 24% of them. A majority of patients in both groups presented with duration of swelling for 1 – 6 months.

**Keywords:** Inguinal hernia, groin swelling, descent of testes

### Introduction

The inguinal canal forms a pathway for the testes to descend from their intra abdominal position through the anterior abdominal wall, into the scrotum. Inguinal canal develop in both sexes because of morphologically indifferent state of sexual development. As the mesonephros degenerates – a ligament gubernaculum passes obliquely through the developing anterior abdominal wall at the site of future inguinal canal. The gubernaculum attaches caudally to the internal surface of the labioscrotal swellings (future halves of the scrotum or labia minora) <sup>[1]</sup>

The parietal peritoneum will produce the processes vaginalis. This peritoneal diverticulum is more important to the male fetus as it will permit the descent of the testes. The embryologic entities between skin and peritoneum permit the processes vaginalis to penetrate them and form the inguinal canal, so the downward journey of the testicle to the scrotum is allowed <sup>[2]</sup>

The vaginal process carries extensions of the layers of the abdominal wall before it, which forms the walls of the inguinal canal. In males these layers also form the coverings of the spermatic cord and testes. The opening in the transversalis fascia, produced by the vaginal process becomes the deep inguinal ring and the opening created in the external oblique aponeurosis forms the superficial inguinal ring <sup>[3]</sup>

Patent processes vaginalis is the prime cause of indirect inguinal hernia in infants and children. The development of the processes, its migration into the scrotum, and its final obliteration are intimately linked to the descent of the testis from the abdominal cavity into the scrotum. These processes are initiated and controlled by the calcitonin gene – related peptide (CGRP) released by the genito-femoral nerve under the influence of fetal androgens. The presence of a patent processes vaginalis does not necessarily indicate that an indirect inguinal hernia is present, nor does it mean that one will necessarily develop in the future. Therefore, additional factors must be present to produce an indirect inguinal hernia besides a patent processes vaginalis <sup>[4]</sup>

There exists a familial tendency to groin herniation. A study of 280 families with congenital indirect inguinal hernias in China indicated that transmission was autosomal dominant with incomplete penetrance of a preferential paternal factor. The hernia usually occurred on right side, consistent with later descent of testes on that side. Such herniation which is more common with prematurity has been ascribed to a delay in maturation <sup>[5]</sup>

Hydroxyproline content, and therefore collagen, which makes upto 80% of the rectus sheath, is found to be strikingly decreased in some hernia patients. This collagen shows altered salt

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precipitability and impaired hydroxylation with a decreased amount of mature, insoluble thick (polymeric) forms. Cultured fibroblasts proliferate less and show reduced uptake of radioactive proline. On electron microscopy, collagen fibrils show irregular periodicity and variable width, with some intracellular fibrillar positioning.

The ability of fascia transversalis to withstand physiologic and pathologic elevations in the intra-abdominal pressure is dependant on the state of the collagen fibres that make up its tissues and give it its strength. Significantly lower levels and hydroxylated proline and lysine seem to be present in fascia samples from direct hernia patients.

Connective tissue disorders – such as Marfan’s Syndrome, Ehlers Danlos Syndrome, Hurler – Hunter syndrome, and certain mesenchymal metabolic defects causing a deficiency of collagen and structural abnormalities of the collagen fibres, predispose to groin hernias [6]

The ability of the abdominal wall in the groin to withstand the forces in favour of herniation may be reduced by the weakening of the muscle and fascia.

Smoking, the most common cause of pulmonary emphysema, evokes a neutrophil – macrophage response. Priming of these white cells and their 5 to 10 fold concentration in the lungs, with release of elastase and collagenase, destroys the parenchyma of lung. It is proposed that the chronic inflammatory response in the lungs affects the circulating blood. Antiproteases and elastase in the blood stream bring about destruction of elastin and collagen of rectus sheath and fascia transverses and so cause their attenuation and pre-dispose to herniation.

**Methodology**

This study was conducted from the patients admitted with the diagnosis of unilateral primary inguinal hernia in General Hospital and Hospital attached to Medical College. The diagnosis of unilateral primary inguinal hernia was made on basis of history of reducible groin swelling and essentially on clinical examination.

Only those investigations were done which were relevant to obtain fitness for surgery. This included random blood sugar, blood urea, serum creatinine, ECG, hemoglobin percentage and routine urine analysis for sugar, albumin and microscopy, chest x-ray and ultra sound abdomen. If any patient was found to have any medical contraindication for surgery, he was first treated for these medical problems and then reevaluated for surgery.

All cases were done under Spinal anesthesia using 3 ml of bupivacaine 2% (Sensorcaine).

**Inclusion criteria**

- Men 20 years of age or older with unilateral primary inguinal hernia.
- Patients who gave consent for the procedure.

**Exclusion criteria**

- Females.
- Recurrent hernias
- Presence of bowel obstruction, strangulation, peritonitis or perforation.
- Associated femoral hernia.
- Patients undergoing orchidectomy in the same procedure
- Patients medically unfit for surgery.

Patients who refused investigations and any kind of surgical procedures were excluded.

**Results**

**Table 1:** Comparison of Age Wise Distribution of Cases

Age group (yrs)	Standard Prolene mesh n (%)	Lightweight meshn (%)
20 – 29	9 (12)	26 (34.66)
30 – 39	8 (10.67)	8 (10.67)
40 – 49	10 (13.33)	6 (8)
50 – 59	18 (24)	9 (12)
60 – 69	20 (26.67)	18 (24)
70 +	10 (13.33)	8 (10.67)
Total	75	75

**Table 2:** Compar Ison of Associated Symptoms

Symptoms	Standard prolene mesh	Lightweight mesh
	n (%)	n (%)
Swelling	75 (100)	75 (100)
Pain	40 (53.33)	36 (48)

In both of the groups, all patients presented with swelling in the groin (100%) and pain was present in 36 cases (48%) of patients in light weight mesh group and 40(53.33%) of patients in standard prolene mesh group.

**Table 3:** Comparison of Duration of Symptoms 3a) Swelling

Duration	Standard Prolene Mesh n (%)	Light Weight Mesh N (%)
< 1 month	-	3 (4)
1 – 6 months	30 (40)	33 (44)
6 – 12 months	3 (4)	3 (4)
12 months – 2 years	12 (16)	21 (28)
2 years +	30 (40)	15(20)
Total	75 (100)	75 (100)
Range	1 month – 6 year	15 days – 4 year

3b) Pain

Duration	Standard prolene mesh	Light weight mesh
< 1 month	-	8
1 – 6 months	19	25
6 – 12 months	9	-
12 months – 2 years	6	-
2 years +	6	3
Total	40	36
Range	1 month - 2 year	3 days – 3 year

A majority of patients in both groups presented with duration of swelling for 1 – 6 months. Similarly majority of the patients in both groups presented with duration of pain of 1 – 6 months.

**Table 4(a):** Comparison of Side Affected

	Standard prolene mesh	Light weight mesh
	n (%)	n (%)
Right	49 (65.33)	56 (74.67)
Left	26 (34.67)	19 (25.33)
Total	75 (100)	75 (100)

Numbers in parenthesis indicate percentages.

A majority of inguinal hernias in both the groups were right sided.

**Table 4(b):** Comp Arison OF Direc T / INDIR ECT SAC

	<b>St andard prolene mesh n (%)</b>	<b>Light weight mesh n (%)</b>
Direct	23 (30.67)	19 (25.33)
Indirect	52 (69.33)	56 (74.67)
Total	75 (1 00)	75 (100)

Numbers in parenthesis indicate percentages.

A majority of sacs found were indirect in both the groups.

**Table 5:** Comparison of Associ Ated Fa Ctors

<b>Associate d factors</b>	<b>Standard prolene mesh n (%)</b>	<b>Light weight mesh n (%)</b>
Smoker (Sm)	18 (2 4)	18 (24)
Benign Enlargement of prostate (BEP)	3 (4)	3 (4)
Bronchitis + B EP (Br+BEP)	3 (4)	3 (4)
Diabetes Mellitus (DM)	6 (8)	9 (12)
Hypertension (HTN)	6 (8)	6 (8)
Bronchial Asthma (BA)	-	3 (4)
HTN + BEP	-	3 (4)
Smoker + Urethral stricture (Sm+US)	-	3 (4)
NIL	39 (5 2)	27(36)
Total	75 (10 0)	75 (100)

Numbers in parenthesis indicate percentages.

The most common factor associated with inguinal hernia in both the groups was smoking accounting for 24% of them.

**Discussion**

Inguinal hernias occur at all ages. They may be present at birth or appear suddenly in an 80 years old person. Indirect inguinal hernia is usually met within first few months of life, in late teens and young adults, whereas a direct inguinal hernia is mostly seen in older subjects.

Indirect inguinal hernia affects the males, 20 times more commonly than females. Direct inguinal hernia is rare in females [7]. Heavy work, especially lifting, puts a great strain on the abdominal muscles. If there is any underlying weakness, the appearance of hernia may coincide with strenuous physical effort. Hard labour workers, sportsmen and weight lifters are more prone.

Many a times hernia is due to disease causing weakness of anterior abdominal wall like obesity, previous lower abdominal operations, ascites and Malgaignes bulges. Certain diseases lead to increase in abdominal pressure such as prostatic enlargement, stricture urethra, chronic cough and chronic smoking. It should be remembered that appearance of a hernia in an adult may be a sign of intra abdominal malignancy [8].

Peritoneal dialysis can cause the development of a hernia from a previously occult weakness or enlargement of a patent processus vaginalis.

- **Pain:** Type of discomfort / dragging / aching sensation may be the chief complaint, gets worse as the day passes. Pain may appear long before the lump is noticed and may continue so long as the hernia is progressing, but ceases when it is fully formed. Pull on the mesentery may cause pain in epigastrium.
- **Lump:** Patient notices swelling in the groin in absence of pain, but usually he will have some sort of discomfort.
- **Systemic symptoms:** Features of intestinal obstruction (colicky abdominal pain/vomiting / abdominal distension absolute constipation) may be present if the hernia is obstructing the lumen of the bowel.
- **Associated symptoms:** Persistent coughing, constipation, dysuria due to benign enlargement of prostate or stricture urethra.
- **Past history:** Whether the patient had any previous abdominal operations especially appendectomy or any other

operation confined to lower abdomen as incisions associated with these procedures may cause subcostal / ilioinguinal nerve division and that leads to weakness of the abdominal muscles. This usually predisposes to direct inguinal hernia.

The patients should be first examined in the standing and then in the supine position. A majority of hernias are better examined in the standing position.

All inguinal hernias share the common feature of emerging through the myopectineal orifice of Fruchaud, the opening in the lower abdominal wall bounded above by the myoaponeurotic arch of the lower edges of the Internal Oblique and the Transverses Abdominus, muscle, and below by the pectineal line of the superior pubic ramus [9].

Inguinal hernia surgeries are one of the most frequently performed operations in general surgery and as such even minor alterations in the outcome have appreciable impact. As surgeons we want techniques with short learning curves, but we still want to attain results comparable to the specialist hernia surgeons.

Our patients on the other hand want their period of convalescence and rehabilitation to be uncomplicated in both short and long term outcome so as to return to their normal daily activities. They need less pain and better quality of life post operatively with minimal surgical morbidity in the long term.

At present, tension-free preshaped mesh hernioplasties have become a gold standard for most operating surgeons and over the last decade several types of meshes have evolved, and are used as single flat meshes or used in conjunction with three dimensional plugs.

In 1984, Lichtenstein addressed the issue of tension by popularizing routine use of mesh (monofilament polypropylene meshes) which was laid on posterior wall of the inguinal canal, and a slit made at the lateral end of the mesh, creating two tails, which pass around the cord as it emerges from the internal ring. Presently newer mesh concepts are the current interest which have less chronic pain, earlier return to normal activities without compromising on recurrence. Light weight mesh is one such concept which meets the above criteria [10].

## Conclusion

- A majority of patients in both groups presented with duration of swelling for 1 – 6 months.
- Similarly majority of the patients in both groups presented with duration of pain of 1 – 6 months.

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