

Role of Low Lying Pubic Tubercle in Development of Inguinal Hernia

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Abstract:

Introduction: Based on origin hernia can be congenital or acquired.[2] Lack of the evolutionary development of a strong posterior rectus sheath and transversalis fascia in lower abdomen is thought to represent a significant specific anatomic defect in the humans. There are various contributing and precipitating factors like chronic constipation, chronic cough, senile enlargement of prostate (all increasing intra-abdominal pressure) and obesity. The lowness of pubic tubercle is associated with narrow origin of internal oblique muscle from lateral inguinal ligament. The narrow origin of internal oblique muscle fails to protect the deep right and consequently indirect inguinal herniation occurs. [3]

Aim and Objective: To incidence of development of inguinal hernia in low lying pubic tubercle.

Observation: A total of 50 cases were included in the study. Out of 50 cases, 48 were males and 2 were females. 19(38%) had direct hernia and 27(54%) had indirect hernia and 4(8%) had pantaloon hernia. 3(6%) had recurrent hernia and 5(10%) had irreducible hernia. ST segment in 4(8%) was < 7.5 cm whereas in 46(92%) it was >7.5 cm that is low lying pubic tubercle.

Conclusion: Thus, it can be concluded that low lying pubic tubercle is associated with increased risk of development of inguinal hernia.

Keywords: low lying pubic tubercle; inguinal hernia;

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I. Introduction

A hernia is defined as protrusion of whole or a part of a viscus through the wall that contains it. Of the abdominal hernias, the common varieties are inguinal, femoral, umbilical, incisional and epigastric, while the rare varieties are obturator, lumbar, gluteal and Spigelian.[1] The inguinal hernia, often referred to as a 'rupture' by patients, is the most common hernia in men and women but much more common in men. There are 2 basic types - lateral (oblique, indirect); medial (direct); there is a third 'sliding' hernia which is acquired but is lateral. Based on origin hernia can be congenital or acquired.[2] Lack of the evolutionary development of a strong posterior rectus sheath and transversalis fascia in lower abdomen is thought to represent a significant specific anatomic defect in the humans. There are various contributing and precipitating factors like chronic constipation, chronic cough, senile enlargement of prostate (all increasing intra-abdominal pressure) and obesity. The lowness of pubic tubercle is associated with narrow origin of internal oblique muscle from lateral inguinal ligament. The narrow origin of internal oblique muscle fails to protect the deep right and consequently indirect inguinal herniation occurs.[3]

In this study, we aim at finding a relationship between low lying pubic tubercle and its incidence with development of inguinal hernia.

II. Material and methods:

This hospital based observational study was conducted on 50 patients admitted in the MGH with clinically proven inguinal hernia.

Inclusion Criteria: All patients presenting to surgical OPD with reducible uncomplicated inguinal hernia with age above 18years.

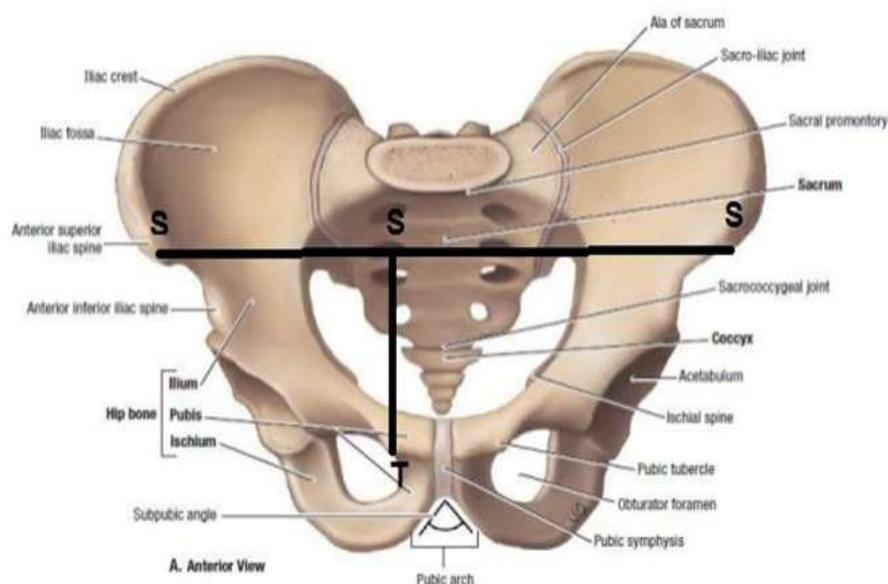
Exclusion Criteria:

Any case with obvious associated factor for hernia (urinary outflow obstruction, trauma, anomaly etc.).

Children below the age of 18 yrs. are excluded as pelvis is not fully developed before this age & exact position of pubic tubercle cannot be determined due to growth of skeletal system

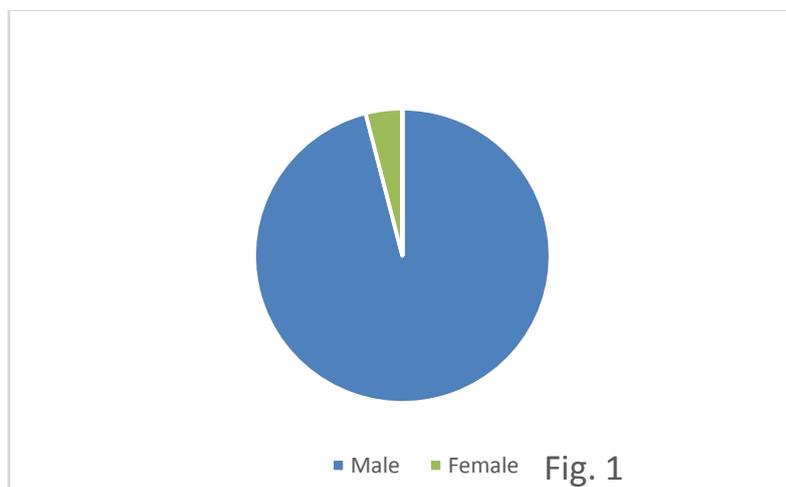
III. Methodology:

The study subjects will lie in supine relaxed position on hard bed. Keeping both their lower limbs straight, so that both the anterior superior iliac spines are at the same level. A line is drawn on the anterior abdominal wall, connecting both anterior superior iliac spine which is given the name SS Line and the length of SS Line is noted; next the pubic tubercle on the side of hernia will be marked by the palpation. Then vertical distance between this point and the SS Line will be measured. This line was designated as ST line.



IV. Results:

A total of 50 cases were included in the study. Out of 50 cases, 48 were males and 2 were females(Fig.1). 19(38%) had direct inguinal hernia and 27(54%) had indirect inguinal hernia and 4(8%) had pantaloon hernia. 3(6%) had recurrent hernia and 5(10%) had irreducible hernia(Fig.2).ST segment in 4(8%) was < 7.5 cm whereas in 46(92%) it was >7.5 cm that is low lying pubic tubercle(Table 1).



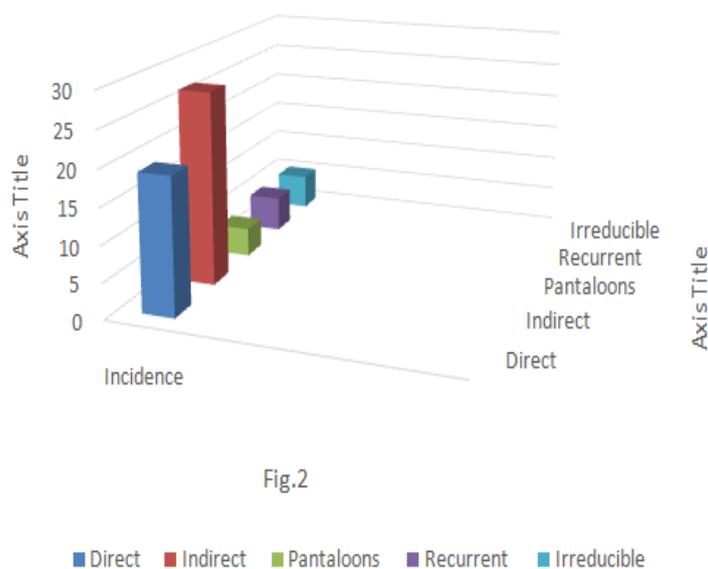


Fig.2

Table 1

ST Segment	Incidence	Percentage (%)
>7.5 cm	46	92
< 7.5 cm	4	8

V. Discussion:

Fundamentally, all sites of herniation possess one common feature i.e. the zone of weakness where structures pass from or to the abdominal cavity. In case of inguinal hernia, as the testis descends from the abdominal cavity to the scrotum in male it first passes through a defect called the deep inguinal ring in the transversalis fascia, just deep to abdominal muscles. Muscle fibres of the innermost two layers of the lateral abdominal wall, the transversus abdominis and the internal oblique muscle, arch over the arch over the deep inguinal ring from lateral to medial before descending to become attached to the pubic tubercle. These two muscles fuse and become tendinous, hence the arch is referred to as the conjoint tendon. Below this arch there is no muscle but only transversalis fascia and external oblique aponeurosis resulting in weakness, and the lowness of the pubic tubercle is associated with narrow origin of internal oblique muscle from lateral inguinal ligament.

This narrow origin fails to protect the deep ring and consequently inguinal herniation occurs. Novarro et al (1992) undertook study in 156 cases of inguinal hernia; they measured distance of pubic tubercle from a horizontal line joining both the anterior superior iliac spines and compared the result with twenty healthy volunteers. The distance of the pubic tubercle from bi-crestal horizontal line was more than 7.0 cm in patients having inguinal hernia as compared to the volunteers, who had less distance. [4]

Chand Sehgal et al (2000) in their study have classified the subjects as (Group 1) “high lying pubic tubercle” i.e. those with ST line more than 7.5 cm and (Group II) “low lying pubic tubercle” i.e. those with ST line more than 7.5 cm. they observed that in 73.6% of cases and only in 16% of controls belonged to Group II and concluded that the low lying pubic tubercle was a predisposing factor for inguinal hernia. [5]

Lopez- Cano et al (2005) have stated that the low pubic arch group showed a significantly longer inguinal ligament at its medial insertion. The lower the pubic tubercles are located, the more often morphological alterations are found in the external oblique, internal oblique, transversus, cremastic muscles and fascia transversalis. [6]

The shutter-like mechanism at the internal inguinal ring is provided by contraction of the arching fibres of the internal oblique muscle, which, when shortened, approximate themselves to the inguinal ligament and compress the spermatic cord. [7]

The unusual origin and insertion of internal oblique and transversus abdominis muscle, results in an ineffective shutter mechanism of the inguinal canal. mehulAgrawat et al (2014) undertook study of 135 cases of inguinal

hernia to evaluate the role of low lying pubic tubercle in development of inguinal hernia and concluded that abnormal origin and insertion of internal oblique and transversus abdominis muscle and thus resulting in an effective shutter mechanism of inguinal canal leading to increased risk of inguinal hernia development, especially in the presence of other risk factors.

In the present study on 50 patients the results are comparable to the previous studies with regards to the measurement of pubic tubercle in Indian population.

VI. Conclusion

Thus, it can be concluded that low lying pubic tubercle is associated with narrow origin of internal oblique muscle and transversus abdominis from lateral inguinal ligament and this narrow origin fails to protect the deep ring and consequently there is increased risk of development of inguinal hernia in these patients. And hence, can help in giving precautionary advice to these patients before occurrence for hernia. The study also concludes that inguinal hernia is more common in males than females and indirect inguinal hernia is more common than direct inguinal hernia.

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