



## Determining the Role of Low Lying Pubic Tubercle for Development of Inguinal Hernia

Ashirwad Sankhe <sup>a\*</sup>

<sup>a</sup> Department of Surgery, DMIMS, Wardha, India.

### Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

### Article Information

#### Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/85660>

Study Protocol

Received 07 March 2022  
Accepted 12 May 2022  
Published 12 May 2022

### ABSTRACT

**Background:** One important factor that determines the probability of an individual to suffer from an inguinal hernia is the location of the pubic tubercle. The purpose of this study was to assess the role of pubo-spinal distance as a causative factor for inguinal hernia.

**Aim:** To assess the the role of pubo-spinal distance as a causative factor for inguinal hernia.

#### Objectives:

- To measure the inter ASIS distance (SS distance) in cases and controls
- To measure the vertical distance between the line joining the two ASIS and pubic tubercle (ST distance) in cases and controls
- To compare and analyse SS and ST distance in cases and controls

#### Methodology:

- The study subjects will be asked to lie in supine relaxed position on a hard bed. Keeping both their lower limbs straight, so that both the anterior superior iliac spine will be at the same level, line will be then drawn on the anterior abdominal wall, connecting both anterior superior iliac spine which will be called the "SS Line" and the length of SS Line will be noted. Next the pubic tubercle on the side of hernia will be marked by palpation. Then vertical distance between this point and the SS Line will measured in centimeters. This line will be designated as "ST line".
- Similar measurements will be done on control as well.

**Results:** At the end of this study, we will be able to ascertain the role of Low-Lying Pubic Tubercle in the Development of Inguinal Hernia.

**Keywords:** Inguinal hernia; pubic tubercle; pubo-spinal distance; causative factors.

## 1. INTRODUCTION

Hernia is the abnormal protrusion of a part or whole of the viscus through a normal or abnormal opening in the cavity that contains it [1]. The inguinal hernia based on anatomical characteristic divided into two types. The most common type is indirect inguinal hernia, in which hernia sac emerge lateral to inferior epigastric artery [2]. It occurs due to the persistence of processus vaginalis. Direct inguinal hernia occurs medial to the inferior epigastric vessels when abdominal contents protrudes along a weak spot in the fascia transversalis which forms the posterior wall of the inguinal canal [3].

Inguinal canal is 3.75 cm in length, extends from deep to superficial inguinal ring. There are various defensive mechanisms of the inguinal canal to prevent the formation of hernia which are based on anatomical factors.

Anatomic variations of different structures facilitating herniation have been assessed. The origin of the internal oblique muscle from the inguinal ligament far away from the pubic tubercle and its lower fibers not covering the internal ring has been implicated in the indirect inguinal hernia [4].

The various degree of incompleteness of the internal oblique muscle in the inguinal region lead to the essential predisposition to direct inguinal hernia. Other factors are an increase in the size of Hessert's triangle [5]. One important factor that determines the probability of an individual to suffer from an inguinal hernia is the location of the pubic tubercle [6]. Even though inguinal hernia is the most common type of hernia, the other types are femoral hernia, diaphragmatic hernia, hiatus hernia, umbilical, epigastric hernia, para umbilical hernia and incisional hernia.

Success of hernia repair is measured primarily by the permanence of the operation, fewest complications, minimal costs, and earliest return to normal activities. This success depends largely on the surgeon's understanding of the anatomy and physiology of the surgical area as well as knowledge of how to use most effectively the currently available techniques and materials [7].

One common feature in all types of hernias is a zone of weakness through which herniation occurs. All the inguinal hernias begin within a single weak area called myopectoneal orifice. As the mankind evolved from Neanderthal man to homoerectus/ homosapiens (upright man) there is thought to be apparent lack of the evolutionary development of a strong posterior rectus sheath and transversalis fascia in lower abdomen which is thought to represent a significant specific anatomic defect.

Complications of inguinal hernia include bowel obstruction, and bowel strangulation and the greatest risk being found among older persons. Inguinal hernia repair is a commonly performed procedure among both adults and children with inguinal hernias constituting more than 95% of all groin hernia repairs various degree of incompleteness of the internal oblique muscle in the inguinal region lead to the essential predisposition to direct inguinal hernia [8]. Other factors are an increase in the size of Hessert's triangle [9]. Early identification of risk factors in early adulthood could help in the prevention of hernia. Pelvimetry with radiograph correlation is a simple and non-invasive method that can help in identification of risk factors and accordingly plan pre operatively the kind of hernia repair to be undertaken [10].

The purpose of this study was to assess the role of pubo-spinal distance as a causative factor for inguinal hernia.

**Aim:** To assess the the role of pubo-spinal distance as a causative factor for inguinal hernia.

### 1.1 Objectives

- a) To measure the inter ASIS distance (SS distance) in cases and controls
- b) To measure the vertical distance between the line joining the two ASIS and pubic tubercle (ST distance) in cases and controls
- c) To compare and analyse SS and ST distance in cases and controls

## 2. METHODS

**Study Design:** Cross sectional Analytical Study.

**Study Setting:** Present study will be conducted at Acharya Vinoba Bhave Rural Hospital.

(AVBRH), a tertiary care teaching hospital situated in rural area of Wardha district, in central India attached to Jawaharlal Nehru Medical College, Sawangi Meghe, Wardha. The study will take place over 2 years in which anthropometric measurements of 150 cases of inguinal hernia and 150 controls attending outpatient and inpatient of AVBRH will be done.

**Methodology:** The study subjects will be asked to lie in supine relaxed position on a hard bed. Keeping both their lower limbs straight, so that both the anterior superior iliac spine will be at the same level, line will be then drawn on the anterior abdominal wall, connecting both anterior superior iliac spine which will be called the "SS Line" and the length of SS Line will be noted. Next the pubic tubercle on the side of hernia will be marked by palpation. Then vertical distance between this point and the SS Line will be measured in centimeters. This line will be designated as "ST line".

Similar measurements will be done on control as well.

### 3. RESULTS

1. An attempt will be made to find any relationship between ST Line and SS Line measurement and height, weight, built, occupation and age with side of hernia of the patient.
2. The ST and SS Line measurements of the case will be compared with those of controls to find out whether there was tendency of having low lying pubic tubercle in case of inguinal hernia.
3. An attempt will also be made to observe any correlation between ST segment and height, weight of the patients.
4. The quantitative variables will be summarized as mean and standard deviation while qualitative variables as percentage and proportion.
5. To test the statistical significance between the two independent two groups student 't' test while in more than two groups ANOVA (one way) will be applied and to show correlation Pearson's correlation will be applied. The difference will be considered significant when p value is less than 0.05. The statistical package SPSS 23 will be used.

### 4. CONCLUSION

At the end of this study, we will be able to ascertain the role of Low-Lying Pubic Tubercle in the Development of Inguinal Hernia.

### CONSENT

It is not applicable.

### ETHICAL APPROVAL

It is not applicable.

### COMPETING INTERESTS

Author has declared that no competing interests exist.

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