



Original Article

## Unilateral Monorchia with Inguinoscrotal Herniation and Contralateral Ectopia Testis.

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### ABSTRACT

**Background:** Monorchism, a condition that arises from the unsuccessful development of a single testis, is widely recognized, despite there being only a few documented cases in the available literature. The majority of hernias manifest in the inguinal area, while the other types occur less frequently.

**Material Methods:** Throughout a 12-year period in the department of anatomy, a total of 120 embalmed adult cadavers (2.75%) were examined, with 101 being males and 19 being females. A routine dissection was carried out to assess the abdomen, pelvis, inguinal, and genital region. In the course of the study, it was observed that some had inguinal and inguino-sacral herniation with complete absence of testis (Monorchia) on one side and contralateral ectopia testis. In other instances, a significant scrotal sac was found to contain herniation with an absence of testis and spermatic cord.

**Results:** During the dissection carried out by medical students, research was conducted on 120 embalmed adult cadavers. Of these, 4 out of 120 (2.75%) were found to have herniation. The specimens revealed a rare occurrence of a large scrotal sac (inguino-scrotal herniation) on one side and the absence of a testis (monorchism), as well as an ectopic spermatic cord on the opposite side.

**Conclusion:** Monorchidism whether congenital or acquired, has long been associated with subfertility in adulthood, but as long as they are in good health and free of any underlying conditions that might influence their fertility, monorchia fertility might be slightly reduced.

**Keywords:** *Monorchia, ectopia testis, inguinal herniation, Inguinal canal, Scrotal sac.*

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### INTRODUCTION

Monorchia is a medical condition characterized by the presence of only one testis. These conditions can either be present from birth (congenital) or develop later (acquired), such as through surgical removal of a testicle [1]. Congenital anorchia and monorchia are uncommon conditions. Monorchism, a condition resulting from the complete failure of the development of one testis, is widely acknowledged, although there are relatively few documented cases in the literature. Any bulging of the abdomen's contents through one of its walls is called a hernia. The components of a hernia are a sac, its contents, and its coverings. Sac, a term for the peritoneum's protrusion. It is composed of a body, a constricted area, and a neck. The elongated mobile coils of the omentum, small intestine, or other visceral organs make up the majority of the contents. Layers of abdominal wall that enclose hernia sac are referred to as the coverings [2].

The inguinal herniation is direct and indirect. An indirect inguinal hernia may develop via the deep inguinal ring and into inguinal canal. It might even move down into the scrotum and poke through the outer ring. This is due to an abnormally large deep inguinal ring with a hernia sac, associated with precipitating factors like cough or constipation, which tends to increase the intra-abdominal pressure. The hernial sac's neck is situated on the side of the inferior epigastric artery as it

traverses the deep inguinal ring. Hernial sac is enveloped by several layers, including the skin, superficial fascia, cremaster muscle and fascia, external oblique aponeurosis, and internal spermatic fascia [3].

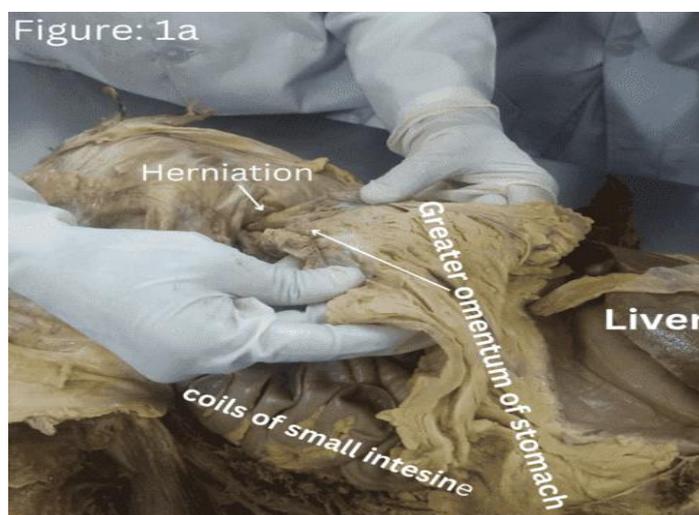
From the lumbar region, the testis typically descends to the scrotum. During the third month of fetal development, the organ moves downward to the iliac fossa. During the 7th month, it is located in close proximity to deep inguinal ring. By the 8th month, it has moved to the superficial inguinal ring. Finally, by the 9th month, it has reached the upper region of the scrotum. The temperature inside the abdomen is greater and not favorable for the development and maturation of the sperm. Cryptorchism is a condition of undescended testis. The testis may be arrested anywhere during its descent, this is due to any of the following factors increased intra-abdominal- pressure, hormonal factors, differential growth and gubernaculum testis, or due to the adhesions and abnormal bands preventing the descent known as Ectopia testis [4]. Ectopia testis may descend into any one of the following sites are medial side of the thigh, prepenile position, perineum, near anterior superior iliac spine, or in abdomen. The lower end of gubernaculum splits five or six tails each going to one of the regions mentioned above and the main tail ends in the scrotum and pulls the testis into it. If any one of the other tails becomes dominant, the testis will deviate from the normal path and will be misplaced[5].

## MATERIALS AND METHODS

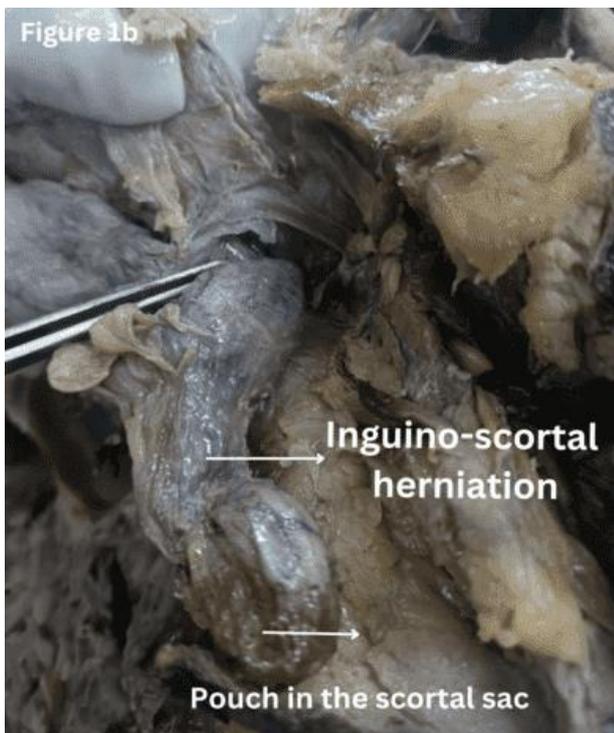
The research had been performed on 120 adult embalmed cadavers (2.75%) evaluated, consisting of 101 males and 19 females. A routine dissection took place for examining abdomen, pelvis, inguinal, and genital region over the period of 12 years in the department of anatomy, various regions of India. Following the guidelines provided in Cunningham's Manual of Practical Anatomy, Volume I, the dissection procedure occurred. The course of study, which was observed, showed that there was an inguinal and inguino-sacral herniation and a complete absence of testis (Monorchia) on one side, and contralateral ectopia testis. In other cases, it was noted that a huge scrotal sac contained a herniation and the absence of testis, and the spermatic cord was documented.

## RESULTS

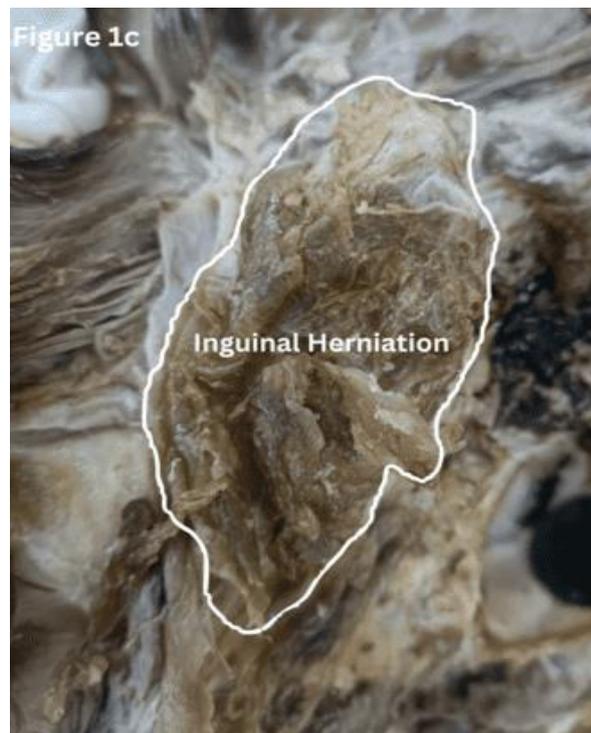
During routine medical student's dissection, the research had been performed on 120 adult embalmed cadavers; among those 4/120 (2.75%) cadavers is herniation. In the first specimen had been reported that there was a huge scrotal sac. Examining the Omentum, appendix, and ileocecal junction proved difficult until the scrotal sac (Figure 1a) split laterally and the stomach's greater Omentum bulged inside the sac. In the second specimen, the right side did not exhibit the presence of the spermatic cord, while several pouches had been observed inside the scrotal sac. The testicles hadn't been visible or palpated (Figure 1b). In the third specimen, a 59-y/o male cadaver was noticed to have a herniation in right inguinal region and an absence of the right testis in scrotum (figure 1c). In fourth specimen, spermatic cord crossed from left to right side; therefore, left testis lies in the right scrotal sac instead of the left side. (Figure 2a,3) just below the herniation of the scrotal sac.



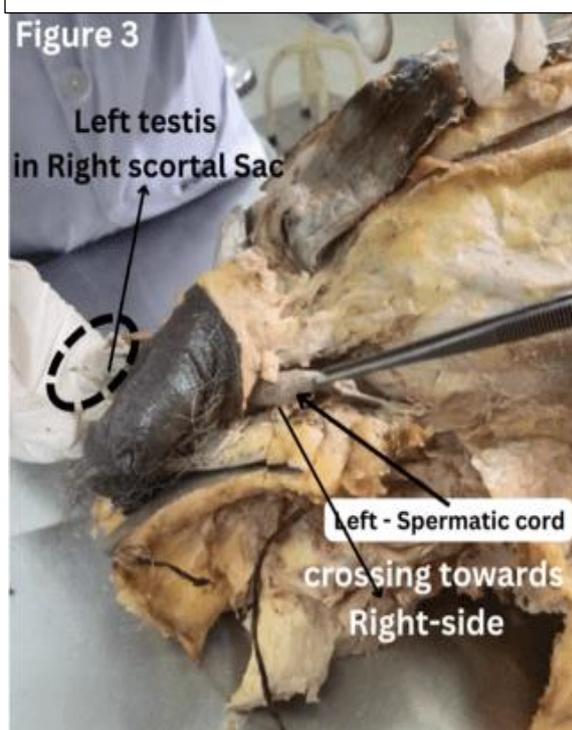
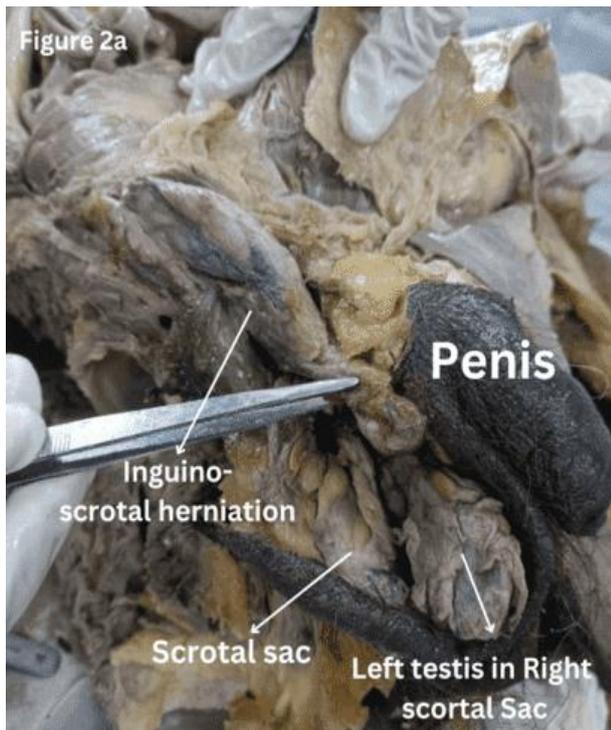
**Figure 1a:** Greater Omentum of stomach protrude inside the hernial sac.



**Figure 1b:** Herinal pouches observed inside the scrotal sac and absence of right testis.



**Figure 1c:** Inguinal herniation and absence of the right testis in scrotum.



**Figure 2a, 3:** spermatic cord crossed from left to the right side, left testis lies in the right scrotal sac instead of the left side, just below the herniation of the scrotal sac.

**DISCUSSION**

Men are affected by inguinal hernias about ten times more often than women, with the right side affected substantially more frequently than the left. The protrusion into the scrotum through the superficial ring, inguinal canal, or deep inguinal ring is what characterizes an oblique or indirect inguinal hernia [6]. In contrast, a direct inguinal hernia results from a protrusion via weakened posterior wall of the inguinal canal, predominantly occurring in older males and featuring a wider

neck. The inguinal region accounts for the majority of hernias, while other types are less common. Complications that may arise from an inguinal hernia comprise obstruction as well as strangulation, which could prompt a surgical procedure for removing the hernia and avoiding serious adverse effects. The intestine, omentum, and, in rare instances, the appendix, ovary, bladder, or liver can all be included in the contents of an inguinal hernia [7].

Galloday ES [8]. reported that 10 percent of the population experiences some form of hernia. This was evidenced during a cadaveric examination of a direct inguino-scrotal hernia, which was noted during the dissection activities of undergraduate medical students in the anatomy department. Furthermore, with a 7:1 ratio of men-to-women, it was discovered that 40% of hernias are of the indirect inguinal type. The prevalence of all hernia types tends to increase with advancing age. The ascending colon, the caecum, and the terminal coils of the ileum are the most frequently discovered matter inside the hernia sac.

In the current case, the greater Omentum of the stomach was identified in the hernial sac. The loops of greater Omentum were notably thick and strangulated, arranged in a conical pattern directed caudally, just before they entered the inguinal canal. Laterally to inferior epigastric artery, these loops enter the deep inguinal region. The hernial sac at internal inguinal ring has been observed to be wide, possibly due to friction with the inguinal ligament caused by hip movements. Inguinal hernias result in intestinal obstruction and strangulation [9,10]

The findings presented in this report indicate the occurrence of a right-sided direct inguinal hernia that continues from the posterior wall of the inguinal canal into the scrotum, identified as an inguino-scrotal hernia. There was a notable absence of the right testis on the right side of the scrotum. Additionally, it was noted that the left spermatic cord was moving from the left to the right with the left testis located in the right scrotal sac instead of its usual position on the left (see figures 3,4 and 5), positioned just beneath the herniated area of the scrotal sac.

Typically, Undescended testicles are found to be associated with a patent process vaginalis in most authentic cases [11]. When a hernia is clearly evident, immediate hernial repair along with orchidopexy is carried out. If no obvious hernia is present, the repair should be executed during the orchidopexy. A man may exhibit symptoms and complications common to any inguinal hernia at any time if he has an undescended testis and an undiagnosed inguinal hernia.

Congenital indirect inguinal hernia caused by patent processus vaginalis, which generally becomes obliterated following the descent of the testis after birth. The abdominal contents may herniate through the open vaginal sac, reaching the base of the scrotum, as is typical in the vaginal type of inguinal hernia. This condition is more prevalent on the right side, as the closure of the processus vaginalis on the right occurs later than on the left. Rarely reported cases like the one in this instance are examples of left direct inguinal hernias. Since treatment is unaffected, distinguishing between an indirect and direct inguinal hernia is not required. Physical examinations may not always be able to distinguish between a less concerning femoral hernia and an inguinal hernia [12,13]. The differential diagnosis is influenced by the specific clinical presentation. An abscess, soft tissue tumor, or lymphadenopathy are possible diagnosis for a groin mass believed to be a hernia. Testicular tumors or hydroceles are two potential underlying conditions for scrotal masses. The clinical presentation influences the differential diagnosis. A soft-tissue tumor, an abscess, or lymphadenopathy are other possible causes of a groin mass that could be a hernia. Testicular tumors and hydrocele can cause scrotal masses [14].

Significant side effects from inguinal hernias include intestinal blockage, strangulation, and infarction. The report's findings, indicate a large, rigidly consistent irreducible scrotal hernia on the right side (fig1). The scrotal sac had multiple pouches, and the testes were either absent or not apparent within. Testicular regression resulting from an undescended hernia may be the cause of this absence of testicles.

The right side of the body experiences hernias more frequently than the left in this instance. The present case exemplifies an indirect type of inguinal hernia, which is more concerning during physical examination and has been informed to be twice as frequent as direct hernias [15].

The male subject exhibiting the current case of inguinal hernia also supported a report stating inguinal hernias are significantly more prevalent in men, occurring 10 times more frequently than in women. A family history of groin hernias has been identified by some studies as a major risk factor for inguinal hernias, it should be noted that they exhibit a higher prevalence in males [16]. Chronic obstructive pulmonary disease, collagen vascular disease, peritoneal dialysis, high intra-abdominal pressure, a history of open appendectomy, smoking, thoracic or abdominal aortic aneurysm, and lower body mass index are additional conditions that have been linked to an increased risk. Ultimately, when a patient exhibits symptoms of a bowel obstruction, it is imperative to conduct a comprehensive examination of the groin area.

About 1:20000 baby boys experience testicular regression; between 0.5 and 4.5% of Monorchia boys fall into this category [17]. In present study absence of testicle in left side and also the absence of spermatic cord structure is rarely condition have notices rather than presence of spermatic card evidence supporting the presence of testis in early pregnancy.

Pathological factors linked to TRS include hemosiderin presence, dystrophic calcification, and Discrete Vascularized Fibrosis, especially in the presence of spermatic cord structure [12]. During the first 16 weeks of pregnancy, the typical male genitalia develop. Although cause of testicular regression is still unknown, testis torsion is thought to be caused by a type of vascular accident.

The absence of one or both testes in the scrotum is known as cryptorchidism. According to published data, the incidence of cryptorchidism was found in 3–4 per 100 full-term newborns and 21 per 100 prematurely born infants. Testes normally descend within three months of birth, but in one to two out of every hundred cases, descent stops after that time, and the patient presents with cryptorchidism.[24] According to A J Kirsch et al, 63% of patients presented before the age of 48 months, with 34 months as an average age at presentation, left-sided (58%), 35% right-sided, and 7% bilateral cryptorchidism was found in the study. Twenty-four percent of adult men over thirty had impalpable testes. During surgical exploration, 39% of impalpable testes were discovered to be distal to the superficial inguinal ring. Atrophic or absent were 41%. 31% were bilateral and 20% were intraabdominal. In this instance, an adult male cadaver's right testicles are missing, which is an extremely uncommon occurrence. Undescended testis (UT) is frequently mistaken for ectopic testis. The latter, which is distinct from cryptorchidism, is an infrequent congenital anomaly[18].

In their study, Rabia Ahmed G.et al. identified 1,132 instances of urinary tract conditions, with 44 cases at 3.9% demonstrating testicular ectopia. Among these, 23 cases, averaging 5 years of age, satisfied the criteria for inguinal ectopic testis. It is essential to acknowledge that congenital inguinal was the most frequently associated anomaly, found in 22.7% of the cases. The current case also showed a hernia that passed through the inguinal ring superficially and at inguinal canal posterior wall (figure 1a).

In India, there are more than a million cases of ectopic testis annually. Typically, only one testicle is impacted. 10% of patients experience problems with both testes. In the general population, it is rare, but it is most frequently observed in premature male newborns. Due to the left side spermatid cord crossing over to the right, the left testis was found in the right scrotal sac in this instance, and the right side spermatic cord was eventually absent (Figure 2a). Testicles were not visible or palpable, and some pouches were discovered inside the scrotal sac. We have noticed that ectopia is on the left side.

## CONCLUSION

Inguinal hernias are frequently encountered; the challenge in accomplishing reduction comes from the considerable content variation in hernial sac along with the anatomical anomalies in abdominal cavity. A thorough examination of the groin and genital region is essential for any patient who presents with bowel obstruction. The repair of the hernia should be performed using conservative methods by skilled practitioners to prevent post-operative complications, recognizing the substantial anatomical and surgical implications inherent in each case.

## ABBREVIATION

TRS- Testicular regression syndrome

UT- Undesend testis

## Author Contributions

Dr. T. Prabhakar and Dr. Sachin patil contributed in article search, data collection and analysis, scripting the article. Sachin Patil contributed to reviewing and editing.

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## Conflicts of interest

None.

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