

## CONGENITAL CRYPTORCHIDISM - ITS ANATOMICAL ASPECTS, EMBRYOGENESIS AND CLINICAL CONSEQUENCES

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**Abstract:** The testes are a pair of male reproductive organs. The testicular variations are unusual and can result in multiple clinical conditions. Congenital cryptorchidism is a condition in which one or both the testes have not passed down the scrotal sac. During a routine cadaveric dissection of a middle aged male cadaver, in the left side of the pelvic part of the abdomen an unusual undescended testis was noted near the deep inguinal ring. Additional to this we also noted a thick band of ligament connecting the epididymis of testis to the fascia transversalis, close to the deep inguinal ring. As per our knowledge such congenital testicular variations has not been cited in the recent medical literature. The anatomical aspects, embryogenesis and clinical consequences of these congenital variations have been discussed in detail. Proper knowledge and awareness of such testicular variations is clinically essential in operative procedures and necessary treatment for monarchism, which improves fertility and endocrine functions.

**Keywords:** Anti-mullerian hormone, cryptorchidism, infertility, sperms, testosterone.

### INTRODUCTION

The testes are pair of oval shaped male genital organs suspended into the scrotum by the corresponding spermatic cord. The primary functions of the testes are to produce sperm [reproductive function] and to produce androgens, primarily testosterone [endocrine function]. Numerous factors interact to effect normal testicular descent. Any abnormality in this process can result in an undescended testis, which carries infertility and malignancy implications.

The undescended testis has lower sperm count or poorer quality of sperms and lower fertility rates than normal testis such variations of testis might cause many complications and misguide the evaluation of fertility of a specific person. For diagnosis of undescended testis numerous imaging techniques, include ultrasonography, computed tomography, magnetic resonance imaging, spermatic venography and laparoscopy have been recommended.<sup>[1,2]</sup>

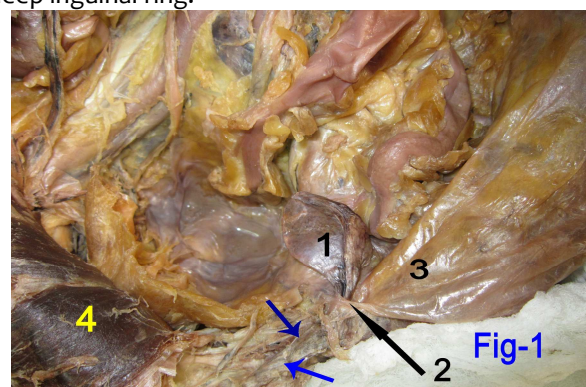
In the present case we described an unusual congenital cryptorchidism and its anatomical aspects, embryogenesis and clinical consequences.

### CASE REPORT

During a routine cadaveric dissection for the undergraduate students in the department of anatomy, we noted a rare congenital undescended testis (cryptorchidism) in a middle aged male cadaver.

- Congenital undescended testis (cryptorchidism) was noted at the left side of the pelvic part of abdomen near the deep inguinal ring [Figure 1].
- Additionally we also noted a thick band of ligament connected the epididymis of the testis to the fascia transversalis close to the deep inguinal ring [Figure 2].
- The right testis was found to be descended normally and present within scrotal sac. Photographs of the testicular variation were taken for proper documentation.

**Fig.1:** Undescended testis (congenital cryptorchidism) at the left side of the pelvic part of the abdomen near deep inguinal ring.



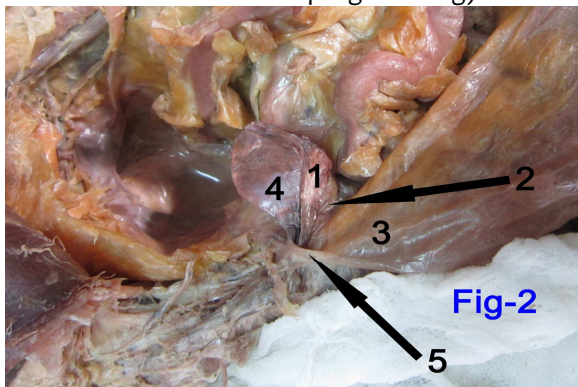
1-Undescended testis; 2-Deep inguinal ring; 3- Fascia transversalis; 4-Rectus abdominus Muscle; Blue arrows- Inguinal canal.

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**Fig.2:** Abnormal attachment of gubernaculum (stretched from the epididymis to the fascia transversalis close to the deep inguinal ring).



1-Epididymis; 2- A thick band of ligament (gubernaculum); 3- Fascia transversalis; 4-Undescended testis; 5- Deep inguinal ring.

## DISCUSSION

The testis begins to develop from the genital ridge in the abdomen at about the 7<sup>th</sup> week of embryonic life. During the fourth month of fetal life, the testis appears in the iliac fossa, and reaches the deep inguinal ring at about the 7<sup>th</sup> month of gestation. During the 7<sup>th</sup> and 8<sup>th</sup> months they pass through the inguinal canal and at or shortly after birth it finally reaches the scrotum. The movement of testis from the abdomen to the entry of inguinal canal and through the inguinal canal is controlled or influenced by anti-mullerian hormone (AMH) and testosterone.

Gubernaculum also called as caudal genital ligament which stretches from the lower pole of testis to the scrotum and plays an important role in the descent of testis. The androgens of foetal testis induce the nerve terminals of genito-femoral nerve to release a peptic neurotransmitter (calcitonin gene-related peptide), which produces rhythmic contractions of the gubernaculum and assist in testicular descent.

The fascia transversalis is a general layer of fascia lying between the inner surface of transverse abdominus muscle and the extraperitoneal fat. It presents an oval gape known as the deep inguinal ring which is situated about 1.25 cm above the mid-inguinal point. Gubernaculum extends from the lower pole of the testis to the bottom of the scrotum. Shortening of the gubernaculum pulls the testis, along with a peritoneal pouch. Whereas a thick band of ligament found in this case was stretched from the epididymis of the testis to the fascia transversalis close to the deep inguinal ring. This thick band of ligament found in this case may be the abnormal attachment of gubernaculum, which prevented the descent of the testis to the bottom of the scrotum. As per our knowledge such abnormal attachment of gubernaculum has not been cited in the recent medical

literature. Such congenital testicular variations may leads to infertility or low sperm count.

Male infertility has many causes the main causes are

- Chromosomal defects
- Hormonal imbalance
- Physical problems
- Psychological or behavioral problems
- Structural abnormalities (Cryptorchidism and Hypospadias) that damage or block the testes, tubes, or other reproductive structures can have a profound effect on fertility.

Cryptorchidism is a condition in which one or both the testes have not passed down the scrotal sac. It is associated with mild to severe impairment of sperm production. The incidence of undescended testis is approximately 1 in 1,000 to 2,500. [3] Undescended testes were reported in the literature, [4, 5] however, it can be noted that none of these cases were similar to our observations in the present case. Unilateral congenital undescended testis noted in the present case may be due to the mal-development of the gubernaculum, or deficiency or insensitivity to either AMH or androgen, in such conditions spermatogenesis often fails to occur. Lifestyle changes and environmental factors may be involved in increase in the prevalence of congenital cryptorchidism within a few generations. [6-8]

The surgical treatment of undescended testicles, called “orchiopexy”, in the recent past it has been recommended in the second year of life, but now orchiopexy is recommended at 6 month of age. [9] An undescended testis is more likely to develop testicular germ cell tumors [10] or testicular cancer, [11, 12] inguinal hernias and testicular torsion. Early diagnosis and treatment by hormonal therapy or surgical repair may reduce the complications of inguinal hernia, testicular cancer and testicular torsion.

## CONCLUSION

The variations of testis especially the congenital cryptorchidism found in this case might cause many complications and misguide the evaluation of fertility of a specific person. Apart from the developmental and morphological interest, proper knowledge of such testicular variations is clinically essential in operative procedures and necessary treatment for monorchism which improves fertility and endocrine functions.

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