

Original Research Article**Study on Congenital Inguino-Scrotal Abnormalities Associated With Undescended Testis****Dr Sumohan Biswas¹, Dr Sudipto Konar², Dr Kalyan Brata Singha³, Dr Maloy Kumar Mondal⁴, Dr Tamal Kanti Ghosh⁵**¹Associate professor, Department of Anatomy, Midnapore Medical College, West Bengal, India²Assistant professor, Department of Anatomy, Burdwan Medical College, West Bengal, India³Assistant professor, Department of Anatomy, Midnapore Medical College, West Bengal, India⁴Associate professor, Department of Anatomy, Burdwan Medical College, West Bengal, India⁵Professor, Department of Pathology, Midnapore Medical College, West Bengal, India***Corresponding author**

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Abstract: The testicles descend to its normal position as a developmental process. When this descent is arrested at any level there is undescended testis or cryptorchidism. This study was designed to survey the various forms of undescended testis with other associated congenital anomalies in pediatric age group. For this purpose we reviewed 116 boys with undescended testis who were treated surgically. Unilateral cryptorchidism was found commoner than bilateral variety with right sided preponderance. Inguinal hernias were recognized pre-operatively or per-operatively in all the 116 cases and hydrocele in 62 per cent cases. Undescended testicles mostly resided in the inguinal canal and least commonly in the abdominal cavity. Hypospadias was the most frequently seen anomaly, having been noted in 10.3 per cent of the 116 cases. The incidence of phimosis was 6.9 per cent. The study revealed many common risk factors like prematurity, short spermatic vessels and small superficial inguinal ring which may be responsible for the failure of testicular descent.**Keywords:** Undescended Testis, Cryptorchidism, Congenital anomaly, Testicular descent, Pediatrics, Orchidopexy.

INTRODUCTION:

During development of male genital system the testes emigrate from the lumbar region of abdominal cavity to the scrotum. This testicular descent may be arrested at any level along in its pathway resulting in absence of one or both testes from the scrotum. This condition is known as undescended testis or cryptorchidism. The topics regarding its etiology, patho-physiology affecting developmental process, investigations and treatment modalities are controversial and much debated [1-2].

Patients with undescended testis usually present with empty scrotum and pain in the groin. Undescended testis may be palpable in the inguinal region or impalpable. Though most of the impalpable testicles lie in the inguinal canal few may be positioned in the abdominal cavity, where agenesis might occur. Apart from psychological and cosmetic problems other common complications of undescended testis include torsion, inguinal hernia and trauma to the organ. The condition is also associated with potential long-term risks of infertility and malignancy [3-4].

Numerous theories have suggested the possible mechanism of normal testicular descent. Clinical and experimental observations supporting and refuting each theory therefore have failed to confirm any one explanation completely. Some authors believe that traction of gubernaculum leads to testicular descent [5]. The gubernaculum has been shown to be androgen responsive and is believed to create a downward force on the testis in some species [6-7]. Experimental transection of the gubernaculum or division of the genito femoral nerve, which indirectly furnishes the gubernaculum, prevents testicular descent in some animals [8]. The role of testosterone in testicular descent is evident in patients with complete androgen insensitivity syndrome [9].

Cryptorchidism occurs more commonly in premature male infants (incidence 33%) than in term male infants (incidence 3%). This finding is not surprising when one consider the previously described hormonal changes during late fetal development that influences at least the inguino-scrotal phase of testicular descent [10].

The incidence of developmental inguino-scrotal anomalies associated with undescended testis is still a matter of curiosity and data on this issue are sparse. The present work was designed to find out different forms of undescended testis, to find out associated congenital abnormalities pre-operatively and per-operatively in the pediatric age group. These findings may throw some light related to its etio-pathogenesis.

MATERIAL AND METHOD:

We reviewed 116 patients of pediatric age group [11] presented to the surgical OPD with empty scrotum. The study was approved by the Institutional Ethics Committee of the Burdwan Medical College of the West Bengal University of Health Sciences. Informed consents were obtained from the parents of the children included in this study.

After recording detailed history careful local examinations and routine clinical evaluations were

done. Radiological examinations as USG were done to determine the presence and location of the undescended testis. Standard single stage Fowler-Stephens orchidopexy (exploration of inguinal canal, mobilization of testis by lengthening of the cord, fixation of testis at the dartos pouch) was done in 110 cases. Two stage Fowler-Stephens orchidopexy was planned in 2 cases with very short spermatic vessels to reduce the risk of a non-viable testis if placed into the scrotum without staging. But in 4 cases orchiectomy was done to remove atrophic testis. Operative findings were noted and possible surgical explanation for undescended testis was tried to seek out.

RESULT:

Significant family history could not be elicited in this study. It was observed that the incidence of right sided undescended testis (Figure 1) were more common (55.2 %) than that of left side (31 %). Bilateral cases (Figure 2) were found only in 13.8 % cases.



Fig-1: Right sided undescended testis



Fig- 2: Bilateral undescended testes

Out of 116 patients in 68 there was a history of premature birth (58.6 %). Testes were clinically palpable in 84 cases (72.4 %) but in others these were nonpalpable.

In this series indirect inguinal hernia was detected pre-operatively and per-operatively in all the cases (100 %). Though in majority of the cases (41.4 %)

testis was found in the inguinal canal but in others it was found to be trapped either at superficial inguinal ring (31 %) or deep inguinal ring (20.7 %). In rest 6.9 % testes were located high up within abdominal cavity. No fascial barrier was found at the scrotal entrance but in 34.5 % cases superficial inguinal ring was found smaller than usual.

Regarding other associated anomalies hypospadias (Figure 3) was found in 12 cases (10.3 %), hydrocele in 72 cases (62 %) and phimosis (Figure 4) only in 8 cases (6.9 %).



Fig-3: Hypospadias with undescended testis



Fig- 4: Palpable bilateral inguinal testes with phimosis

Small spermatic vessels were detected in 32 cases among which in 2 cases spermatic vessels were very small necessitating staged orchidopexy.

DISCUSSION:

Cryptorchidism or undescended testis is one of the most common pediatric disorders of the male endocrine glands and the most common genital disorder identified at birth. Though environmental effects appear to play a major role in undescended testis a monogenic reason for cryptorchidism has been identified only in a small proportion of all cases [12]. In our study we failed to correlate any relevant family history.

In most study series, the incidence of unilateral cryptorchidism is usually around twice that of bilateral

undescended testes (68% versus 32%, respectively) and the right side is affected more often than the left (70% versus 30%) [13]. so our study echoes findings of these previous studies. The testicular hormones involved in testicular descent are largely active on a local or paracrine point. Therefore unilateral defects in hormone action may lead to unilateral cryptorchidism [14]. The right-sided predominance is possibly because that right testicle descends later than the left one during embryonic development [15].

Previous studies as well as our study have demonstrated that undescended testes are more common in premature babies than in term babies [16]. Testicles don't move down into the scrotum before birth. Because the androgen dependent testicular descent occurs late in

gestation and shortly before birth the testicles usually move into scrotum [10].

Undescended testicles are often classified according to their location and whether they can be felt (palpable or nonpalpable) [17]. Nonpalpable testis may be due to its location in abdominal cavity or atrophy [18].

In this series in all cases there were hernia detected clinically or per-operatively and hydrocele was identified in majority. Failure of the testis to descend into the scrotum and patency or anomalous closure of the processus vaginalis result in the following conditions: cryptorchidism, inguino-scrotal hernia and hydrocele [19].

Other congenital anomalies found in the present series were hypospadias and phimosis. During late gestation, production of LH and possibly other fetal pituitary hormones appears to be necessary for completion of external genital development, genital growth and testicular descent, as evidenced by the common findings external genital anomalies and cryptorchidism in cases of congenital hypopituitarism [14]. Testicular descent and urethral tubularization are both androgen-dependent process. Testicular maldescent and incomplete tubularization of the urethral plate occur in a spectrum dependent on the androgenic hormonal axis [20]. Genetic defects in androgen production or action also can cause both cryptorchidism and hypospadias [12].

Earlier researchers thought that a fascial barrier at the scrotal entrance (third inguinal ring) constituted an obstruction to descent and was the factor responsible for the testis assuming a pubic or superficial inguinal position [21]. In our study it was not possible to determine any fascial barrier that can result in the abnormal testicular location.

CONCLUSION

Regarding undescended testis, various theories have been put forward to the etiology of imperfect descent of testis. The known causes (single gene defect, chromosomal abnormality, maternal drug ingestion) at best can account for only about one fourth of cases and the etiology of most remain unknown [22]. In this patient series 116 patients of pediatric age group with unilateral or bilateral undescended testis. Regarding possible causes of testicular maldescent short spermatic vessels were responsible in 32 cases and small superficial inguinal ring in 40 cases but in the remaining cases factors were not certain. Health education has to be emphasized regarding these anomalies, each new born male child has to be examined and the parents should be informed

accordingly and operation for placement of testis in scrotum must be ensured to avoid late complications.

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