



Early Surgery for Undescended Testes

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Introduction

Undescended testis (UDT) is a common pediatric condition affecting 3% of newborns and 1% of male infants. About 85% of the UDTs are unilateral (1). Clinically, they are classified as palpable (high scrotal, ectopic, intra-canalicular) and nonpalpable (intra-abdominal, intra-canalicular, absent) testes. About 20% of the total UDTs are nonpalpable and of these 40% may be absent (unilateral/bilateral anorchia).

The treatment of undescended testes has undergone a sea change in the last 25- years. Earlier recommendations were for delayed surgery as late as puberty. However, at present it is believed that a testis that remains undescended at 1- year of age, should be treated at that time. Existing embryological, hormonal, histologic, physiologic and psychologic information relevant to UDTs have all guided us to reach at this conclusion for early orchiopexy (1-4).

WHY EARLY ORCHIOPEXY ?

(A) **Embryology of testicular descent** : Testis develops from the genital ridge which is situated just below the kidney. The migration of fetal testis to scrotum involves various phases (abdominal, inguinal, scrotal), each affected by mechanical, neurohormonal and genetic (*y-antigen*) factors. Although these factors are not correctable, it has been documented that administration of gonadotrophins (HCG, dihydrotestosterone) can induce premature descent of testes. Furthermore, UDTs are more common in patients with disorders

of decreased gonadotrophin production or androgen synthesis/action. Both these facts elucidate that "*UDTs are an endocrine related disorder*". Recent reports indicate that besides having some relationship to abnormal descent, persisting hormonal abnormalities may affect germ cell development and subsequent fertility ; and hence early treatment (hormonal/surgical) is important.

(B) **Frequency of UDTs** : The incidence of UDTs directly relates to fetal maturity and size. At birth approximately 3% (full term) to 30% (premature) of neonates have UDTs. By one year of age, this frequency falls to less than 1% and remains constant at that level throughout childhood to adult life. Therefore, it is inferred that no testicular descent occurs after 1 year of age and hence treatment at this age is recommended.

(C) **Gross and histological changes in UDTs** : Gross morphologic changes are associated with "*smaller than normal testis*" in all untreated cryptorchid patients. These changes are progressive and start at very early age. Furthermore, the testicular damage as evidenced on histology starts even earlier than gross findings. The microscopic changes noticed in UDTs are :

(i) At birth, the number of germ cells in undescended and normal descended testis is same. However, the germ cells may be qualitatively abnormal in UDTs.

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- (ii) There is a progressive fall in germ cell count and other testicular cells as related to the period of undescend. During first 6-months of postnatal life, there is no change. After 6-months of life till one year there is some decrease in germ cell counts. However at around 2-years of age, 25 to 40% decrease in germ cells may have occurred.
- (iii) Another important aspect which is recently recognised is that the germ cell number in descended testis in unilateral UDTs is abnormal as well. That means UDTs are always a bilateral phenomenon possible resulting from an underlying hormonal abnormality.

The above facts again seem to make us believe that an early orchiopexy (6-months to 18-months) at one year of age shall be effective to reduce the effect of abnormal position of the testis, causing damage to germ cells.

(D) Fertility statistics after early intervention :

Fertility is unusual in the adult in whom neither testis has descended. In earlier series (1,4) even after orchiopexy fertility figures have been between 23 to 59% (sperm counts: 20 millions/cc). Recent literature (2-4) on early orchiopexy and fertility statistics shows that according to age at orchiopexy, the fertility rates are ; at 2years: 90% ; 3-4 years: 50-70%; 5-8 years : 40%; 9-12 years: 30%. We believe that, when orchiopexy is done at 6 months to 18 months of age, the results shall be much better (2,4).

- (E) UDTs and malignancy :** Histologically, several studies show that malignancy occurs with more frequency in both treated and untreated UDTs. Ten percent of Ca-testis is in patients with UDTs, a 20-40% figure higher than general population. Recent observations show that 0.04% of cryptorchid white males will develop a testis tumor annually (3). Furthermore, there is a high incidence of carcinoma in-situ (CIS) in patients of UDTs. The cause of this high incidence of malignancy seems to be atrophied testis because of its extrascrotal position with Y-chromosomal sex. Therefore, it is assumed that

early orchiopexy may offer a protective effect to avoid CIS or frank testicular malignancy.

- (F) Diagnosis and ease of operation :** Retractable testes are not seen in infancy as the cremastic reflex is absent at this age. So the diagnosis of UDTs is easy. Furthermore in infants, the vas and other cord structures are well developed as compared to older children, thus the operation is not difficult, if done by an experienced surgeon. Also, orchiopexy can be done on a day care basis without any difficulty. However, it is pertinent to mention here that an inguinal hernia/orchiopexy operation in an infant is not a simple procedure to be undertaken by a surgeon occasionally operating on children, especially neonates and infants.

Conclusion

Early orchiopexy at one year (6-months to 18-months) of age is recommended in patients with UDTs. A few reports have indicated that this approach will improve the fertility figures in these patients on long term follow-up. Although, there are no definite data regarding the decrease in future malignancy in corrected UDTs, it is hoped that early orchiopexy may have protective effect in this regard.

The role of hormonal treatment is not clear but it may be tried in patients between 6-months to 1-year of age (unilateral) and all patients with bilateral UDTs. Recent trials have shown that if hormonal treatment is combined with orchiopexy below 1-year of age, the results may still be better.

References

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