

# Evolving Morphological changes of testis in UDT patients

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## Abstract

**Introduction:** Undescended testis is a common problem in children. Cryptorchid testis is frequently accompanied by gross morphologic changes with regard to the size and shape of the testis, various degree of detachment between the epididymis and testis. We assessed the epididymal anomalies and patency of process vaginalis in boys with UDT.

**Material & Method:** It is a prospective study which was performed on all cases of UDT operated in a social security hospital between June 2006 and October 2007. All patients were operated on by one surgeon. In addition to general demographic data, the association between the patency of processus vaginalis and epididymal adhesion to testis was evaluated.

**Results:** There were 81 patients. The mean age of patients was 30 months (3 months to 10.9 years). Forty eight patients had unilateral and 33 patients had bilateral UDT. In the unilateral group 79.2% and in the bilateral group 78.8% had palpable testis. The mean ( $\pm$ SD) size of testis in the palpable group was  $10.8 \pm 3.1$  mm and in the non-palpable group was  $8.5 \pm 3.3$  mm ( $t=2.89$ ,  $p=0.005$ ). The Spearman  $\rho$  correlation coefficient showed that with increasing age the size of testis is also increased ( $\rho=0.41$ ,  $p<0.001$ ). The mean size of testis in patients with normal epididymal adhesion was  $12.6 \pm 3.3$  mm, with partial adhesion  $10.8 \pm 3$  mm, and in patients without epididymal adhesion was  $8.9 \pm 2.5$  mm ( $F=18.4$ ,  $p<0.001$ ). Of 110 UDT, the process vaginalis was patent in 101 cases (91.8%).

**Conclusion:** Process vaginalis is patent in most of cases of UDT. There is a meaningful correlation between testis size and epididymal adhesion. Testis abnormality (in size and epididymal adhesion) is seen more commonly in non-palpable cryptorchid patients.

## keywords

- Undescended testis
- Cryptorchid testis
- morphologic changes

## Introduction

During fetal development the testes are first at the level of the kidney. As the fetus grows the testes begin to descend and by the 36th to 38th weeks of intrauterine life they usually arrive at the level of scrotum. However in UDT, there is a blockage in testes descent through this path. UDT is a common problem in male new-borns (about 1% to 4%) and is more common in premature infants.

It is assumed that there is a structural abnormality in the testes and epididymis or hormonal levels that prevents normal descent. Epididymal abnormalities are seen in 35% to 75% of patients with UDT1 particularly in those located at a higher position.<sup>2</sup> On the other hand this may influence their fertility. Since histomorphologic changes occur during the first year of life in cryptorchid boys, most authors believe in orchiopexy before their first birthday. In this study testes size, epididymal adhesion to testes and their correlation with gonadal placement and also patency of process vaginalis were assessed in boys with UDT.

## Material & Method

This is a prospective study which was performed on all boys with UDT referred to a social security hospital between June 2006 and October 2007. All patients were operated on by the same pediatric surgeon through a standard groin and scrotal incision or Fowler-Stephen technique (in cases of intra-abdominal testes). Age, side of cryptorchid testes, size, being palpable or non-palpable, situation of epididymis, other coexisting urologic abnormalities, patency of process vaginalis, and type of operation were evaluated.

The statistical tests were Chi Square, One way ANOVA test and Post HOC analysis (Bonferroni type).

## Results

There were 81 patients in this study. The mean age of patients was 30 months (3 months to 10.9 years). Location of the cryptorchid testis was on the left side in 22 cases (27.2%), in 26 cases (32.1%) on the right side and in 33 cases (40.7%) it was bilateral. In 48 patients with unilateral UDT, 79.2% (38 cases) were palpable and 20.8% (10 cases) were non-palpable. In patients with bilateral UDT, (66 cases of UDT) 78.8% (52 cases) were palpable and 21.2% (14 cases) were non-palpable. There were four vanished testes only in the unilateral group. In all cases of unilateral UDT the operation was performed in one stage, but in the bilateral group 4.5% (3 cases) had a 2 stage (Fowler-Stephen) operation. **Table 1** shows the relationship between size of testes and location and whether they are palpable or not.

**Table 1** Size of testes in different UDT groups.

Groups	Unilateral UDT	Bilateral UDT	Palpable	Non-Palpable
mean	10.3(3.2)	10.4(3.4)	10.8(3.1)	8.5(3.3)
(SD) mm				
T, P	t=0.15	p=0.88	t=2.89	p=0.005
Value				

**Table 2** and **Table 3** show the relationship between the type of epididymal adhesion and the location of testes and also whether they are palpable or not.

**Table 2** Epididymal adhesion in unilateral and bilateral UDTs

Epididymal Adhesion	Unilateral UDT	Bilateral UDT
Normal	12 (27.3%)	21(31.8%)
Partial	6 (13.6%)	15 (22.7%)
Without	26 (59.1%)	30(45.5%)

Chi Square test,  $\chi^2=2.3$ ,  $p=0.32$

**Table 3** Epididymal adhesion in Palpable and Non-Palpable UDTs

Epididymal adhesion	Palpable UDTs	Non-Palpable UDTs
Normal	30 (33.3%)	3 (15%)
Partial	18 (20%)	3 (15%)
Without	42(46.7%)	18 (60%)

Chi Square test,  $\chi^2=3.8$ ,  $p=0.15$

The mean ( $\pm$ SD) size of testes in patients with normal epididymal adhesion was  $12.6\pm 3.3$  mm, with partial adhesion was  $10.8\pm 3$  mm and in patients without epididymal adhesion was  $8.9\pm 2.5$  mm. This difference was statistically significant (One way ANOVA test,  $f=18.4$ ,  $p<0.001$ ).

With post HOC analysis (Bonferroni type) it appeared that, the differences in testes size in cases without epididymal adhesion compared to cases with partial or normal adhesion; were significant ( $p$  value=0.03  $\bar{U}<0.001$ ). But it was not meaningful in cases with partial adhesion compared with cases with normal adhesion ( $p$  value=0.06)

The Spearman's correlation coefficient showed that as age increases the size of testis increases, too ( $\rho=0.41$ ,  $p<0.001$ ).

Of all 110 cases of UDT, the processus vaginalis was patent in 101 cases (91.8%). Other coexisting anomalies were: 3 cases of hypospadias, 2 inguinal hernias and one penile chordee.

## Discussion

In this study 20.8% (10 cases) of the unilateral group and 21.2% (14 cases) of the bilateral group were non-palpable; these results are almost comparable with Kirsch and colleagues' study (24%).<sup>3</sup> Epididymal adhesion was abnormal in 75% (21 cases) of non-palpable group and 66.7% (60 cases) of the palpable group; this was not statistically significant. The processus vaginalis was patent in 91.8% (101 cases). These results can be compared with Barthold's and Favorito's study.<sup>4,5</sup> They showed that higher incidence of epididymal anomalies are associated with patent processus vaginalis irrespective of testicular position. This may reflect the androgenic effect on processus vaginalis closure and epididymal development as well as testes descent.

According to our results, the epididymal adhesion abnormalities were not significantly different in unilateral or bilateral UDTs. This means that the same etiologic factors are responsible in pathological unilateral or bilateral testes descent. Immunohistochemical and morphologic evaluation show abnormal development of the epididymis in UDT cases which is evident in childhood.<sup>6</sup> As a matter of fact cryptorchidism is a primary congenital abnormality of testis and duct and surgical descent can only have a

minimal effect in preventing cellular damage; it cannot change the epididymal developmental abnormality with its consequent increased risk of infertility.

The mean ( $\pm$ SD) size of testes was not significantly different in unilateral or bilateral UDTs ( $p=0.88$ ), but palpable testes were statistically larger than non-palpable ones with a  $p=0.005$  (Table 1). This differs from Hussain Taqvi and colleagues' study.<sup>7</sup> Our study revealed that the testes size is statistically larger in patients with normal epididymal adhesion compared with those cases who have partial or no adhesion; thus we can conclude that a hormonal correlation may exist between testicular size (as a producer), epididymal adhesion (as the target) and testes descent (as the result).

According to this conclusion one might expect that in cases with smaller testicular size more epididymal abnormality and subsequently infertility should occur; but surprisingly in a study by Lee et al.<sup>8</sup> there was no association between a history of cryptorchidism and small testes size at orchiopexy and decreased paternity.

## Conclusion

The processus vaginalis was patent in most cases of UDT in this study. There was a positive correlation between testes size and epididymal adhesion. Testes abnormalities (in size and epididymal adhesion) are seen more commonly in non-palpable UDTs. Further follow-up for evaluating the change in testicular size in surgically descended ones and later evaluation for fertility and recording of these values are recommended.

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