Nephro-Urol Mon. 2011;3(3):196-200
Nephro-Urology Monthly
Journal home page: www.NUmonthly.com

# Adult orchidopexy: A survey on necessity of intraoperative testicular biopsy

Mahmoudreza Moradi [1, 2], Babak Karimian [1, 2*], Asaad Moradi [1, 2]

[1] Urology-Nephrology Research Center, Kermanshah University of Medical Sciences, Kermanshah, IR Iran
[2] Fertility-Infertility Research Center, Kermanshah University of Medical Sciences, Kermanshah, IR Iran

ARTICLE INFO

*Article Type:*
Original Article

*Article history:*
Received: 28 Oct 2010
Revised: 7 Jan 2011
Accepted: 16 Jan 2011

*Keywords:*
Biopsy
Orchiopexy
Undescended testes
Carcinoma in situ

ABSTRACT

*Background:* Cryptorchidism as the most prevalent congenital anomalies after birth is evident in more than 3% of live male newborns. The relative risk of neoplastic changes in undescended testes has been shown to be 40 times more in comparison to normal population. It is now believed that pre-malignant changes cannot be expected in undescended testes before puberty; therefore performing testicular biopsy while orchiopexy during pre-puberty has been gradually abandoned and its predictive value has become less valuable.
*Objectives:* Studying intraoperative pathology samples of undescended testis (UDT) to determine the rate of their malignancies.
*Patients and Methods:* From 2002 to 2006, we investigated pathology specimens of our patients including adults above 14 years old undergoing orchiopexy due to UDT at Kermanshah University Medical hospitals.
*Results:* Studied population were 100 patients 14 to 45 years old with average age of 20.5 years, among them 52 persons had right UDT, 40 persons with left UDT and 8 persons with bilateral UDT.A total of 108 testes were studied. In 89 cases testicular atrophy proved to exist while not in the rest 11 ones. In 71 cases, testes were intracanalicular while in the other 37 cases were intra-abdominal. After studying the pathology results, no report of pre-malignant changes carcinoma in-situ status (CIS) was found in all 100 patients.
*Conclusions:* The indication of doing testicular biopsy in adults suffering from UDT can be revised. Owing to no report of any malignancy in these cases, substitution of intraoperative testicular biopsy with long-time follow up can be utilized to reduce expenses and surgical trauma.



▸ *Implication for health policy/practice/research/medical education:*
This article focuses on the importance of self-examination periodically after orchiopexy and schedule routine examinations and follow-up up by urologist in patients with undescended testes.

▸ *Please cite this paper as:*
Moradi M, Karimian B, Moradi A. Adult orchidopexy: A survey on necessity of intraoperative testicular biopsy. *Nephro-Urol Mon*. 2011;**3**(3):196-200.

## 1. Background

Cryptorchidism is one of the most prevalent congenital anomalies after birth. It is evident in more than 3% of live male newborns. This prevalence reaches to 1% by the age of 1 year which is almost same as in adults. The importance of undescended testes (UDT) mostly relies in its preponderant risk of testicular cancer, as approximately 10% of the testicular tumors are believed to arise from cryptoid testes. The relative risk of neoplastic changes in un-

* *Corresponding author at:* Babak Karimian, Second floor, No.52, Zartoshtian St., Shiraz Jonoubi Ave., P.O. Box: 143691816, Tehran, IR Iran. Tel: +98-9121028792, +98-2188038994, Fax: +98-2188271100.
*E-mail:* babak.karimian@doctors.org.uk

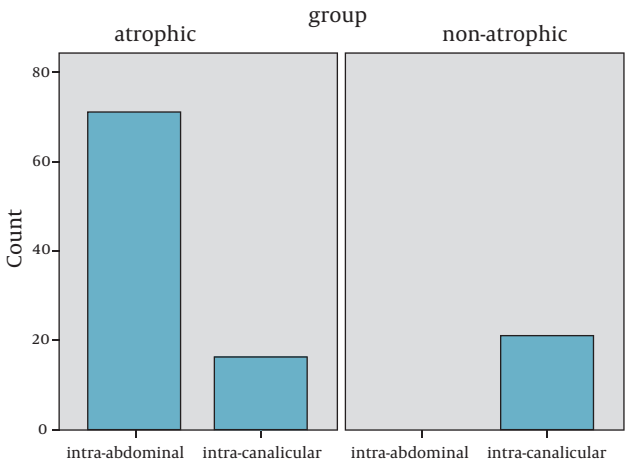


**Figure 1.** Atrophy by location

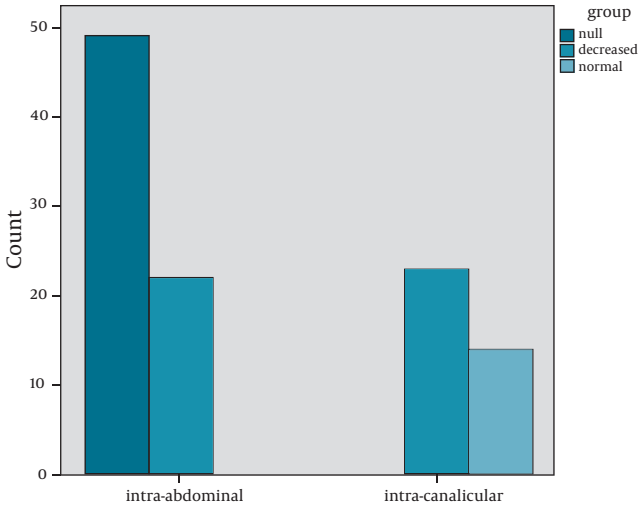


**Figure 2.** Germ Cell Count by location

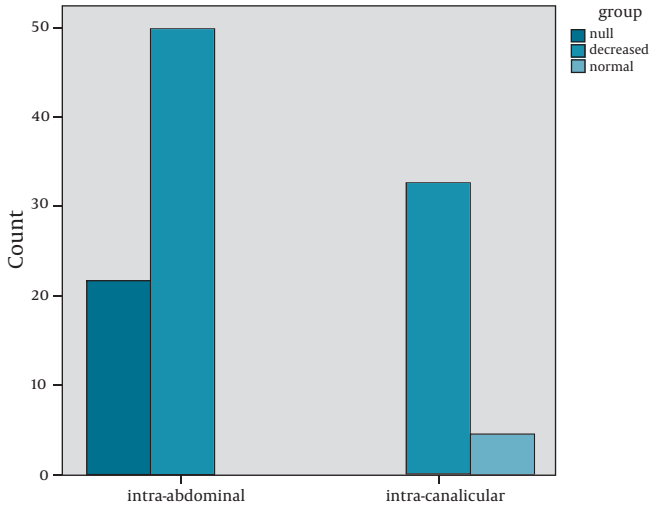


**Figure 3.** Spermatogenesis by location

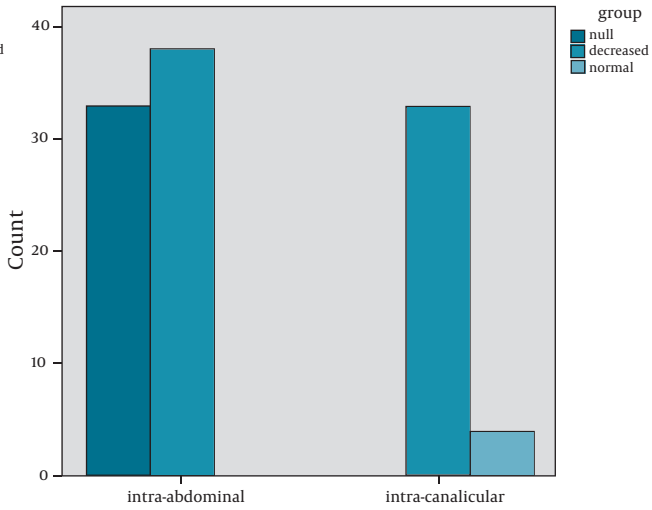


**Figure 4.** Maturation by location

descended testes has been shown to be 40 times more in comparison to normal population (1). It is estimated that the rate of in situ carcinoma in cryptorchidism is about 1.7% (2), meanwhile the effect of orchiopexy on testicular tumors expedition remains controversial although there seems to be some evidence that pre- puberty orchiopexy may reduce the risk of tumor formation in these testes (3). It is now believed that pre-malignant changes cannot be expected in undescended testes before puberty; therefore performing testicular biopsy while orchiopexy during pre-puberty has been gradually abandoned and its predictive value has become less valuable (4).

## 2. Objectives

Due to the considerable prevalence of uncorrected UDT in adults in Iran and because of the fact that some reports mention possible higher prevalence of cancer in these patients, we studied adults referring to our center with orchiopexy of their UDT(s), and investigated their histopathologic findings with special attention to rule out the presence of CIS.

## 3. Patients and Methods

Between 2002 and 2006, 100 adult patients (108 testis units) were referred to us for UDT and were included in our study. While hospitalized, they were questioned about their relevant medical history and physical examination and para clinical tests were performed. After patients were explained about the nature and reason for performing intraoperative testicular biopsy, they were asked to sign the informed consent form to allow it while orchiopexy was being performed. During orchiopexy operation, testicular biopsies were performed at two distinct places and the samples were sent to pathology lab in Bouins Solution. Besides, in those patients who had severe atrophic testes or inappropriate length of spermatic cord or in those with ages above 32 years and required orchiectomy, whole testis was sent to the

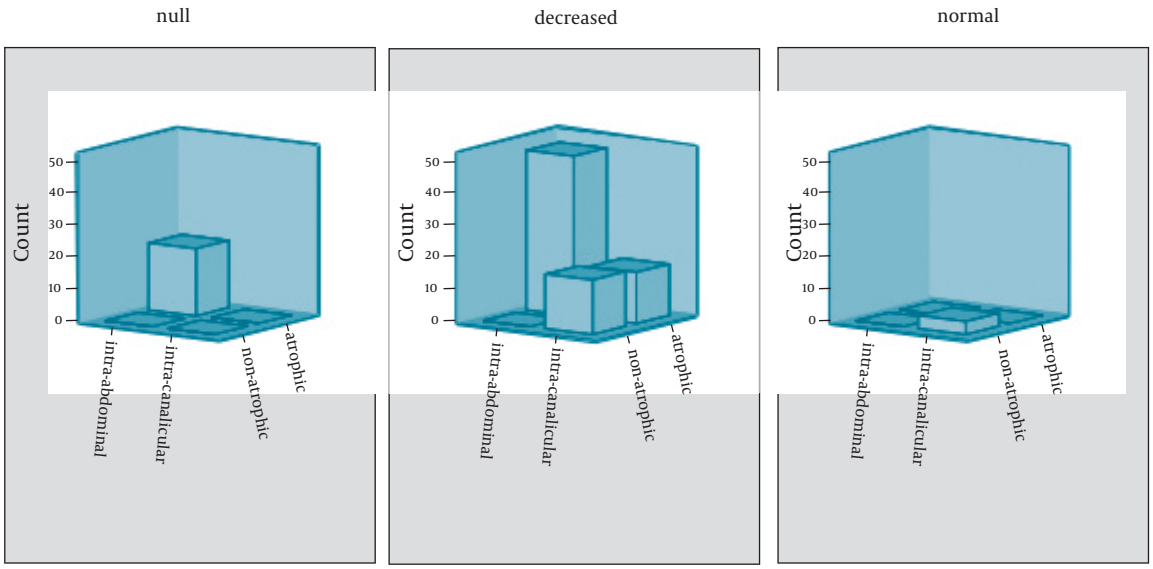


**Figure 5.** Spermatogenesis in different locations and types of testes (Note the presence of some spermatogenesis in some of the atrophic testes.)

pathology section for analysis. All samples were investigated by the pathologist with special consideration to possible existence of CIS in them. The studied variables were location of the testes, status of the testes (atrophic or not), population of germ cells, presence of spermatogenesis and carcinoma in situ (CIS) Data were analyzed by SPSS version 16.0.

**Table 1.** Demographic data of UDTs cases from March 2002 to March 2006 (Total number of patients = 100)

| | |
|---|---|
| **Age** (yr) | |
| **Average age** | 20.5 |
| **Minimum age** | 14 |
| **Maximum age** | 45 |
| **Family History** (No.) | |
| **Positive** | 11 |
| **Negative** | 89 |
| **History of previous orchiopexy** (No.) | |
| **Positive** | 10 |
| **Negative** | 90 |
| **Location of UDTs by examination** [No. (%)] | |
| **Right sided** | 52 (48) |
| **Left sided** | 48 (44.6) |
| **Bilateral** | 8 (7.4) |
| **Examination status** [No. (%)] | |
| **Palpable** | 43 (39.8) |
| **Impalpable** | 65 (60.2) |
| **Size / Location of UDTs by ultrasound** [No. (%)] | |
| **Intra-canalicular** | 71 (65.7) |
| **Atrophic** | 60 (55.5) |
| **Normal** | 11 (10.2) |
| **Intra-abdominal** | 37 (34.2) |
| **Atrophic** | 37 (34.2) |
| **Normal** | 0 |

## 4. Results

In our study, 100 patients with average age of 20.5 years old (14-45) were studied. UDTs were located at right side in 52 patients and at left side in 48 patients; meanwhile in 8 patients UDT was bilateral. Thus, 108 testis biopsies were investigated. At physical examination, UDTs were palpable in 43 patients and impalpable in 57 patients; however, according to sonography, UDTs were intra-canalicular in 71 patients and intra-abdominal in other 29 patients *(Figure 1)*. All the demographic data are listed in *table 1.* According to pathologic results, number of germ cells of the testes was normal in 14 cases, decreased in 66 cases and did not exist in 28 cases *(Figure 2 and 4)*. Normal spermatogenesis were noted in 4 cases, decreased in 83 cases and ceased in 21 cases *(Figure 3 and 5)*. In all of the cases, thickness of basal membrane and tunica albuginea were increased; however, in none of the samples, presence of CIS was reported. Thus, as mentioned we did not see any case of CIS in our samples but a variety of pathologic findings were observed, as listed in *table 2.*

## 5. Discussion

Based on our study, in none of our 108 UDT pathology reports was any case of CIS observed, even though in 89 cases the testes were atrophic. This has been reported merely in two other studies (4, 24). Testis tumors usually develop during puberty and thereafter, although there are reports of tumor development before 10 years of age. The concept that a testes being more histologically abnormal the longer it remains cryptorchid was proposed by Cooper in 1929. Pathologic events following UDT emerge commonly between 1 and 2 years of age,

**Table 2.** Pathology results

| | Average Age (yr) | Atrophic testis (No.) | Non-atrophic testis (No.) | Total [No.(%)] | Average Age (yr) | Intra-canalicular testis (No.) | Intra-abdominal testis (No.) | Total [No.(%)] |
|---|---|---|---|---|---|---|---|---|
| **Germ Cell Count** | | | | | | | | |
| **Normal** | 16 | 4 | 10 | 14 (13) | 16 | 14 | 0 | 14 (13) |
| **Decreased** | 22.5 | 59 | 7 | 66 (61) | 22.5 | 46 | 20 | 66 (61) |
| **Null** | 23.5 | 28 | 0 | 28 (26) | 23.5 | 11 | 17 | 28 (26) |
| **Spermatogenesis** | | | | | | | | |
| **Normal** | 14.7 | 0 | 4 | 4 (3.7) | 14.7 | 4 | 0 | 4 (3.7) |
| **Decreased** | 21.5 | 68 | 15 | 83 (76.8) | 21.5 | 54 | 29 | 83 (76.8) |
| **Ceased** | 23 | 19 | 2 | 21 (19.5) | 23 | 13 | 8 | 21 (19.5) |
| **Sperm Maturity** | | | | | | | | |
| **Normal** | 14.7 | 0 | 4 | 4 (37) | 14.7 | 4 | 0 | 4 (37) |
| **Rare** | 21.5 | 54 | 17 | 71 (65.74) | 21.5 | 63 | 8 | 71 (65.74) |
| **Aborted** | 23 | 33 | 0 | 33 (30.5) | 23 | 4 | 29 | 33 (30.5) |

Basement membrane/tunica properia thickening : All (108); Carcinoma in Situ: None (0)

comprising hypoplasia of Lydig cells, Sertoli cells degeneration, delaying both in Gonocytes disappearance and adult dark (Ad) spermatogonia appearance, failure of primary spermatocytes to develop, and reduced total germ cell counts (Miningberg *et al.,* Huff *et al.,* and Rune *et al.*) (5-8). The cause of the increased risk for malignant degeneration of the undescended testis is theoretically exposure of the testis to increased temperature and/or possibly an intrinsic pathologic process affecting both testes. This theory is supported by evidence of increased risk of tumor formation in normally descended contra lateral testes (9-12).

In 1972, Skakkebaek reported finding carcinoma in situ in the testis of an infertile man with an undescended testis that developed a germ cell tumor 16 months later (13). Since that time, it has been estimated that the prevalence of carcinoma in situ is 1.7% in patients with cryptorchidism. Giwercman (2) studied 300 UDT adults and reported in situ carcinoma in 5 patients (1.7%), normal spermatogenesis in 37% and very low sperm count in 80%. This study indicated risk of in situ carcinoma higher than normal population, suggesting testicular biopsy following with long time follow up. Also The United Kingdom Testicular Cancer Study Group (3) found a significant association of testicular cancer with undescended testis and inguinal hernia. However, the risk associated with undescended testis was eliminated in men who had had an orchiopexy before 10 years of age and therefore it was concluded that the trend to perform orchiopexy at younger ages may reduce the associated risk of testicular malignancy. Moller and associates (14) reported a large cohort of men in Denmark and observed the relative risk (RR) of testicular cancer in men with treated or persisting cryptorchidism to be 3.6 (95% confidence interval [CI], 1.8 to 6.9) times higher. This study also provided evidence that the relative risk for cancer in men who were treated for cryptorchidism increased with age at treatment. Domico and Steven in a study in 2000 (15, 16) reported the risk of carcinoma in adults with UDT to be 1/500 meaning 400 times more than normal population. Finally, in a complementary study, Radojkovic and Ilic (17) analyzed the pathology samples of 37 UDT patients and found 2 patients with positive criteria of in situ carcinoma and some patients with atypical germinal cells in seminiferous tubules, suggesting pre-pubertal orchiopexy as an appropriate utility for screening in situ carcinoma and malignancy in such patients.

On the contrary, in some other studies (16, 18-20) albeit agreeing higher risk of GCT in adult UDT, performing orchiopexy in these patients wasn't considered to be promising. Moreover, Pauers *et al.* (18) and others (12, 21, 22) had proposed that in the state of healthy contralateral testis, orchiectomy can be preferred over orchiopexy. On the basis of published reports, the higher the position of UDT, the higher the risk of expected malignancy (abdominal versus intra canalicular). Also in some of them presence of atrophic testes (more reduction in Germ cells) would lead to much possibility of cancer. Interestingly, in a study from Netherlands by Welvaart *et al.* (23) the exact risk of cancer in UDT patients was announced to be unknown and performing orchiectomy was suggested to be done in cancer proven testes. In another study by Muffly *et al.* (24) no premalignant changes had been reported in UDTs and finally in a complementary study by Parkinson *et al.* (4) the pathology reports of 70 UDTs were studied leading to finding merely a single case of CIS which was CIS negative 11 years before. Additionally, the results of this study suggest that performing intraoperative biopsy while orchiopexy can be of no advantage (24). Finally, we noted that few studies have precisely suggested against performing biopsy in these cases and this was our motive to support this idea based on the results of our study

(25). We conclude that there is no absolute indication for performing testicular biopsy while operating the adult cryptoid testes (26).

Additionally, because of exposure of patients to more surgical trauma and increase in the cost of treatment, we do not recommend intraoperative biopsy while performing orchiopexy in adult UDTs. Although in some articles taking intraoperative biopsy had been suggested, we observed no sign of CIS in patients whose testes have no signs of disease in preoperative examination or ultrasound sonography (27). In this case, we recommend our patients to do self-examination periodically after orchiopexy and schedule routine examinations and follow up by urologist (28). In fact, there is no exact indication of expecting spermatogenesis in these patients, but as we noted 4 cases of normal spermatogenesis in these patients, regarding recent improvements introduced in ART (Assisted Reproductive Techniques), mainly in ICSI (intracytoplasmic sperm injection), we consider these patients to be candidates for ICSI, especially if we note this matter in patients with bilateral atrophic UDTs (29). Therefore, we suggest perhaps in (atrophic) UDT patients or ones with contra lateral poor spermatogenesis testes; ART and mostly ICSI warrant further notification.

## Financial support

None decladred.

## Conflict of interest

None decladred.

## Acknowledgments

We want to thank all of Imam Reza general hospital and 4th Shahid Mehrab Hospital devoted their time and energy to us and our patients.

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