

Age at Diagnosis and Surgery for Cryptorchidism: A Single Center Study in Baghdad

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ABSTRACT

Background: Undescended testis (UDT) is the most prevalent genital abnormality in boys and owing to its long-run complications, it must be managed before one year of life.

Objectives: was to determine the age of presentation of UDT to our institution, the age at surgical intervention, application of current guidelines and the outcome of surgery.

Patients and methods: We prospectively studied 70 boys with UDT admitted for orchiopexy at urology center in Al-Yarmouk Teaching Hospital/Baghdad/Iraq in 2017-2019. Patients were distributed into 3 age groups based on the time of surgery; age \leq 1 year (group 1), $1 < \text{age} \leq 2$ years (group 2) and age > 2 years (group 3). Laterality of UDT, palpability, age at diagnosis and surgical treatment, kind of surgical procedure and post-operative complications were evaluated

Results: Of the 70 children included in the study, 75.7% exhibited unilateral cryptorchidism, 78.5% testes were inguinally sited (most common). Most testicles were palpable clinically (69%). The mean age at time of diagnosis was 1.61 ± 2.07 years whereas at time of surgery was 2.46 ± 2.37 years. The mean interval between diagnosis and surgical treatment was 10.2 ± 0.78 months. Boys who underwent surgery before their 1st birthday, before 2nd birthday or later were 4.3%, 30% and 65.7% respectively. Open surgical technique performed in 95.7% of cases

Conclusion: Most patients comprised in the study underwent surgery at an age later than recommended by international guidelines due mainly to delayed referral and delay by parents. This issue can be overwhelmed by updating the awareness concerning UDT management

Keywords: undescended testis, cryptorchidism, orchiopexy

INTRODUCTION

Undescended testis (UDT) or cryptorchidism is the inability of one or both testes to descend to its normal scrotal location at childbirth (Ghirri et al, 2002). It is one of the ultimate popular congenital urological abnormalities of males which can be unilateral or bilateral (Cortes et al, 2008)

The testicular evolution and descent to the scrotum depend on endocrine, genetic, mechanical and growth factors (Ritzen, 2008)

The incidence at birth extends from 2% to 4 % (Huston et al, 2010); amongst premature infants the number is as great as 30% (Virtanen et al, 2008). This percentage falls to 0.8-1% at 1 year of age after that spontaneous testicular descent hardly takes place. (Khatwa et al, 2000).

Cryptorchidism can cause disturbed fertility, torsion, testicular malignancy, psychological consequence &/or concomitant inguinal hernia (Hrivataki et al, 2014). So as soon as UDT diagnosed, it is suggested to treat it by orchiopexy that should be accomplished within the age of 6-12 months in accord with recent guidelines (Radmayr et al, 2017), nevertheless, the ideal timing of surgery is yet broadly disputed. Several studies revealed that the usual age of boys with UDT at the time of surgery is until now exceeding the recommended age (Nah et al, 2014).

Though the majority of surgical operations are successful, \leq 33% have been stated to encounter failures, reliant on the primary position of the testis, including intense complications like testicular atrophy. These complications

may eventually necessitate orchidectomy or review orchiopexy (Tarun et al, 2006)

The objective of this study was to determine the age of presentation of UDT to our institution, the age at surgical intervention, application of current guidelines and the outcome of surgery.

PATIENTS AND METHODS

This study was carried on 70 boys with UDT at urology center in Al-Yarmouk Teaching Hospital/Baghdad/Iraq over 3 years' period from January 2017 to December 2019.

Sample size included all children with congenital UDT from birth until 5 years' old who were admitted for orchiopexy

Patients received hormonal therapy and those with retractile testis, acquired UDT, persistent UDT (failed surgery), associated medical diseases (which can lead to retardation in referral) or the UDT as part of Prune belly syndrome were excluded from our study.

The diagnosis and situation of UDT was made by physical examination while the boy was in upright, supine and squatting positions.

Prior to surgery; testis palpability, unilateral Vs bilateral UDT and/or its side were recorded. Ultrasonography was used to confirm the diagnosis.

The study was approved by the ethical committee of the institute and informed consents were obtained from all patients' parents before enrolling in this study.

Orchiopexy was performed using inguinal or laparoscopic approach according to the location of the UDT.

Patients were divided into 3 groups based on the time of surgery: age ≤ 1 year (group 1), $1 < \text{age} \leq 2$ years (group 2) and age > 2 years (group 3)

The study characteristics comprised the following:

- laterality of the cryptorchid testis;
- palpability;
- concomitant genitourinary anomalies;
- age at diagnosis and surgical treatment;
- kind of surgical procedure and
- post-operative complications

After surgery Patients were followed up at 1, 3, 6 months and 1 year with clinical and ultrasound examinations for

prompt recognition of any alteration in the site, volume or consistency of the testes.

The Statistical Analysis System- SAS (2012) program was performed to detect the influence of different elements on article variables. Chi-square test was applied to identify significant comparison among averages in the current research.

RESULTS

Through the study period and out of 70 patients presented with UDT, 53 (75.7%) displayed unilateral UDTs (29 right sided & 24 left sided), whereas the other 17 (24.3%) cases got bilateral UDTs. (Table 1)

Table 1: Lateralization of UDTs

Age group	Left n (%)	Right n (%)	Bilateral n (%)	Number (%) of patients Testicles	
≤ 1 year	0 (0.0)	2 (66.6)	1 (33.3)	3 (4.3)	4 (4.6)
$1 < \text{age} \leq 2$ years	6 (28.5)	10 (47.6)	5 (23.8)	21 (30)	26 (29.9)
> 2 years	18 (39.1)	17 (36.9)	11 (23.9)	46 (65.7)	57 (65.5)
Total	24 (34.3)	29 (41.4)	17 (24.3)	70 (100)	87 (100)
p-value	0.0027**	0.0001**	0.0439*	0.0001**	0.0001**

* ($p \leq 0.05$), ** ($p \leq 0.01$)

Around 90% of cryptorchidism was either at the upper scrotum, superficial inguinal ring (suprasacral) or in the inguinal canal (inguinal), whilst 10% was either halted at the deep inguinal ring or intra-abdominal (above inguinal) (Table 2).

Table 2: Sites of UDTs and surgical approaches

Location	Group 1 n (%)	Group 2 n (%)	Group 3 n (%)	Total n (%)	P value	Surgical approach n (%)
Upper scrotum	1 (33.3)	2 (9.5)	1 (2.2)	4 (5.7)	0.0001**	Inguinal
External ring	2 (66.6)	3 (14.3)	3 (6.5)	8 (11.4)	0.0001**	67 (95.7)
Inguinal canal		13 (62)	38 (82.6)	51 (72.9)	0.0073**	
Internal ring		1 (4.7)	3 (6.5)	4 (5.7)	0.581	
Intraabdominal		2 (9.5)	1 (2.2)	3 (4.3)	0.105	Laparoscopic 3(4.3%)
Total	3 (4.3)	21 (30)	46 (65.7)	70 (100)	0.0006**	70 (100)

Out of 87 cryptorchid testes, the palpable and impalpable UDTs were 60 and 27 (69% and 31% respectively)

The mean age at orchiopexy was 2.46 ± 2.37 years (range from 0.58 to 5 years). Age of boys at surgical treatment was as followed: within 1 year [$n = 3$, (4.3%)], between 12 to 24 months [$n = 21$, (30%)] and older than 2 years [$n = 46$, (65.7%)] (Table 3). All patients with suprasacral and inguinal testes were submitted to orchiopexy by traditional inguinal approach, while patients with abdominal testicles underwent laparoscopic orchiopexy (Table 2). Nearly 29%

of cases had combined operations with orchiopexy, most commonly were circumcision in 11 patients, herniotomy in 7 and hydrocelectomy in 2 cases.

The mean age at date of diagnosis was 1.61 ± 2.07 years (range from 0.008 to 3.3 years). Age at initial diagnosis was shown in (Table 3), there were 48 (68.6%) cases detected within 2 years of age and 22 (31.4%) cases determined later; however despite early diagnosis; only 24 (34.2%) patients were operated on during their first 2 years of life.

Table 3: Age distribution at time of diagnosis and surgery

Age group	At time of diagnosis n (%)	At time of surgery n (%)
0-12 months	18 (25.7)	3(4.3)
12-24 months	30 (42.9)	21 (30)
> 24 months	22 (31.4)	46 (65.7)
Total	70 (100)	70 (100)
P-value	0.0269*	0.0001**

The mean interval between diagnosis and surgical treatment was 10.2 ± 0.78 months.

Four (5.7%) boys out of 70 who were submitted to orchiopexy experienced complications: hematoma occurred in 1 boy, sepsis in 1 and 2 boys developed wound infection.

DISCUSSION

Testicles that keep undescended within 6 months of life are improbable to descend in a spontaneous manner (Alhazmi et al, 2018), consequently patients have to be referred for operation to assure well-timed orchiopexy between 6 and 12 months of age (Surgical advisory Panel, 2014) to prevent complicated states of histological alterations, infertility and malignant tumor (Africa Gasana et al, 2012)

In our series of patients, the UDT cases were largely unilateral (75.7%) with involvement of the right side in 41.4% of patients. This number was nearly comparable to the findings in else researches which as well revealed notable right side involvement (Suljendic et al, 2018; Chan et al, 2015; Malakarjuna et al, 2018), nevertheless this finding opposed the result of Mohammad et al ref 15 who stated that the most prominent side to be the left.

In this study, most boys displayed the UDTs in the inguinal canal followed by suprasacral position and the scarcest site (4.3%) was intra-abdominal, which was in accordance with other studies (Radmayr et al, 2017; Malakarjuna et al, 2018). Conversely diverse results were informed by other researches; one of them (Abolyosr, 2006) established that the cryptorchid testes were high abdominal in 47.1% of patients, 31% of boys exhibited the UDT in the inguinal canal and 8% displayed the undescended testicle at the inguinal canal exit. Other one (Castillo et al, 2014) demonstrated the intra-abdominal UDT in 55% of children.

As consistent with another study whose the proportion of palpable UDTs was 66, 94% (Keith et al, 2005) we noticed that 69% of undescended testicles in the current study were palpable. This finding was also in agreement with the percentage of palpable cryptorchid testes in 2 other studies (Mohammad Alnoajji et al, 2019; Alsaywid, 2013). On the other hand, in a different study a considerably higher percentage of UDTs (90%) was palpable (Sharif et al, 2017). Impalpable UDTs were either because of their location (intracanalicular, intraabdominal) or their size (testicular atrophy)

In the present study 42.9% of our patients were detected after the 1st year of their life with a mean age at diagnosis of 19.3 ± 2.07 months. This concur with other studies (Neel, 2010; Chen et al, 2013) demonstrating that 45% to 57.6% of their patients were diagnosed after their first birthday with 13.7 months mean age of diagnosis (Alsowayan et al, 2018)

In spite of debates concerning the time of surgical treatment, some studies documented rational latent fertility when orchiopexy was performed during the 1st year of life (Kollin et al, 2007; Park et al, 2007) others record reasonable results when the operation is achieved before the age of 2 years (Kim et al, 2011) nevertheless performance of

orchiopexy at an age between 6 and 12 months may avoid further harm to the testes and may improve fertility in the future (Jallouli et al, 2009; Jungwirth et al, 2012)

In our center, the mean age at time of operation was 2.46 ± 2.37 years which was far away from the best possible age advocated for surgery. Comparing our consideration with other researches from everywhere in the world, similar results of late repair were found with a mean age of orchiopexy ranged from 1.6 to 5.1 years (Malikatjuna et al, 2018; Neel, 2010; Chen et al, 2013; Marchetti et al, 2012; Bayne et al, 2011; Jensen et al, 2011, Moslemi, 2014; springer et al, 2013; Lim et al, 2003; Dobanovackic et al, 2016; Kokorowski et al, 2010) representing poor obedience to the professional guidelines on timing of orchiopexy, displaying a public problem. Nonetheless, promising results were reported by some studies (Alsaywid, 2013; Bajaj et al, 2017) which showed a mean age at surgery being 11 and 12.6 months respectively

The late corrective surgery beyond the global proposed age is yet a worldwide dilemma. This is of alarming as delayed surgical repair for UDT may be accompanied by bigger danger of testicular tumor and reduced fertility possibility in the patients (Carson et al, 2014). The reasons for this postponement are either attributed to delayed diagnosis, delayed referral or delay owed to parents (Alsowayan et al, 2018; Sinha et al, 2008). In current research we discovered that although about 2/3 of boys with UDTs were identified within 2 years of age; only half of them underwent surgery at age ≤ 2 years old and the total percentage of primary surgery achieved after 12 months up to 5 years was 95.7%. This figure was very much higher than two studies (Hrivatakis et al, 2014; Nah et al, 2014) reporting 70% and 82% of cases undergoing surgical treatment after 12 months and indicating that there was an obvious delay in demonstration of cases. In our institution the potential explanations of late presentation of UDTs were incorrect checkup of the external genitalia post-delivery because the public health workers had limited information and poor policy about UDTs, absence of programed testicular examinations by referring staff, mistaken facts offered to families concerning appropriate timing of operation based on international guidelines and recommendations, a study in the united states showed that just 14% of general practitioners and 30% of pediatricians supported orchiopexy before the 1st year of life (stickler et al, 1995). Additional survey in USA stated that 20% of physicians did not refer boys with crytorchidism till puberty (Shnorhavorian et al, 2012) additional reasons for surgical delay in our community included negligence of parents due to lower educational level and poor socioeconomic status of the family.

Most patients in this study (95.7%) underwent operation by open surgical procedure, whereas the laparoscopic technique was performed only in (4.3%) of cases. Sharif et al recorded the usage of laparoscopy in only 9.65% of their cases (Sharif et al, 2017)

In the present study the mean interval between diagnosis and surgical treatment was 10.2 ± 0.78 months. Similarly, in a study made by (Mohammad alnoaijii et al, 2019), a fairly same period was identified (8 months)

Complications were recognized in 4 patients (5,7%) in our series. Comparable average of complications was described by preceding studies ranging from 4.2% to 6.8% (Alsaywid, 2013; Sharif et al, 2017)

The limitation of the present study involved confinement to single center in Baghdad, so it could not be popularized to other hospitals (academic and public), small figure of studied patients, short-term observation and lack of data on orchiopexies done by general or pediatric surgeons

CONCLUSION

In our study the larger number of boys was submitted to orchiopexy past the international recommendation between 6-12 months of age. Learning programs to educate pediatrician, surgeons and parents are essential to improve alertness of the significance of the early identification and scheduled surgical treatment of undescended testes

CONFLICT OF INTEREST

None

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