

Original Research Article

Undescended testis: timing of referral and surgical intervention, Urology Center, Benghazi, Libya.

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ABSTRACT:

BACKGROUND: Undescended testis (UDT) is the failure of testes to descend into the scrotum. It is classified according to the site of arrest into; Intra-abdominal, deep inguinal ring, canalicular, or emergent from the superficial inguinal ring. The diagnosis of UDT is mainly clinical and its treatment is usually surgical. The aim of our study is to analyze age distribution at the time of diagnosis and treatment to determine if the international guideline recommendations are followed in our institution or not.

PATIENTS & METHODS: A retrospective study was carried at Urological Center by reviewing the files of 75 consecutive patients admitted to the hospital in the period from July 2011 to April 2014. A data flow sheet was used to record and analyze the patients' personal data, age at diagnosis, physical findings, type of surgical procedure, and the age of the patients at the time of surgery, as well as surgical findings.

RESULTS: Total number of patients enrolled in the study was 75 patients. Fifty-two cases were diagnosed at birth, 14 cases discovered incidentally, and 9 cases were presented with reducible inguinal swelling with or without pain. The 75 patients had 93 UDTs, 49 UDTs on right side and 44 UDTs on left side. Sixty-nine UDTs were clinically palpable while the other 24 UDTs were not palpable (74.2% and 25.8% respectively). The mean age at the time of diagnosis was 3.7 ± 8.3 years. However, the mean age at the time of surgery was 10.8 ± 10 years. The surgical procedures performed were: orchiopexy (n=58, 62.3 %), orchiopexy combined with ipsilateral hernial repair (n=16, 17.2%) and orchiectomy (n=19, 20.4%).

CONCLUSION: In our institution, the mean age at orchiopexy was significantly delayed beyond the recommended time of surgery because of delayed diagnosis or referral.

KEYWORDS: Atrophied testis, Cryptorchidism, Orchiopexy, Undescended testis.

INTRODUCTION

When the testis is arrested in its normal pathway and fails to reach its dependent position in the scrotum, it is called as undescended testis (UDT) or cryptorchidism. Undescended testis is the most

common congenital endocrine anomaly of the male sexual development [1]. The testicular development and descent to the scrotum depend on genetic, endocrine, growth and mechanical factors [2]. The incidence of primary UDT in premature and full-term

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infants are is 33% and 3-5% respectively. However, because of early postnatal spontaneous descent of affected testes, the incidence may decrease and becomes 0.8- 1% by the age of one year [3]. Because of changes occurring in UDT due to high local temperature [4], the risk of malignant transformation is 5 to 60 times , greater than normal [5], in addition to the risk of infertility. It is well known that early orchiopexy decreases the risk of infertility and testicular malignancy [6, 7], so the ultimate function of the UDT depends on the age at which the testicle descends into the scrotum [8]. International guidelines now recommend performing orchiopexy for congenital UDT before age of 1 year [2, 9, 10]. However, neoadjuvant GnRH hormonal therapy for these patients may improve fertility later in life [11].

The aim of this study is to identify whether orchiopexy is performed in our institution according to international guideline recommendations or not.

PATIENTS & METHODS

A retrospectively study is conducted by reviewing files of 75 patients known to have unilateral or bilateral UDTs, who underwent surgical intervention over a period of approximately 3 years (July 2011 to April 2014) at Urology Center. The data were collected from the hospital database by using the procedure code (Orchiopexy or Orchiectomy) or UDT code; including personal and clinical information such as the mode of presentation and laterality of UDT, as well as age of patients at the time of surgery, and surgical findings (i.e. site of arrest and size of UDT). The data collected were formulated in Excel workflow sheet. The patients who have another chronic medical illness or the UDT was a part of a syndrome like prune belly syndrome, have been excluded from the study because the condition is evident and the postponing of surgical intervention was due to a medical decision.

STATISTICAL ANALYSIS

The clinical data and statistical descriptive analysis (numbers of events and their respective percentages) were performed with aid of (JMP Pro software) from SAS version 12.

RESULTS

The total number of the cases diagnosed to have UDTs and were enrolled in the study was 75 patients. Eighty percent (n=60) of cases were operated on at age \leq 15 years and 20% (n=15) of cases were operated on

at age more than 15 years. The mean age at a time of surgery was 10.8 ± 10.3 years (Table 1).

Table 1: Age distribution at the time of surgery

| Age Group | Number of cases | Percentage | |
|----------------|-----------------|------------|----------|
| ≤ 5 Years | 33 | 44 % | 60 (80%) |
| 6-10 Years | 14 | 19 % | |
| 11-15 Years | 13 | 17 % | |
| 16-20 Years | 2 | 2.6 % | 15 (20%) |
| 21-25 Years | 3 | 4 % | |
| 26-30 Years | 3 | 4 % | |
| >30 Years | 7 | 9.4 % | |

The mode of presentation of 75 patients was as follows: diagnosed at birth (n=52), discovered incidentally during circumcision and during the clinical examination for infertility or other medical problems (n=14), and presented with inguinal swelling with or without inguinal pain (n=9) (Table 2).

Table 2: Mode of presentation of UDT patients

| Presentation | Number of cases |
|----------------------------|-----------------|
| Diagnosed at Birth | 52 (69.3 %) |
| Discovered incidentally | 14 (18.6 %) |
| Presented with Pain | 2 (2.6 %) |
| Inguinal Swelling (Hernia) | 4 (5.3 %) |
| Pain & Inguinal swelling | 3 (4 %) |

Out of 75 patients presented with cryptorchidism, 57 cases had unilateral UDTs, while the other 18 cases, had bilateral UDTs, therefore, in 75 patients, there were 93 units involved as follows: 49 right sided UDTs and 44 left sided UDTs which represent 52.6% and 47.3%, respectively (Table 3).

Table 3: Laterality of undescended testes

| Age Group | Right | Left | Bilateral | Number of | |
|----------------|-------|------|-----------|-----------|--------|
| | | | | Cases | Testes |
| ≤ 5 years | 11 | 15 | 7 | 33 | 40 |
| 6-10 Years | 5 | 2 | 7 | 14 | 21 |
| 11-15 Years | 5 | 5 | 3 | 13 | 16 |
| 16-20 Years | 1 | 1 | -- | 2 | 2 |
| 21-25 Years | 1 | 1 | 1 | 3 | 4 |
| 26-30 Years | 2 | 1 | -- | 3 | 3 |
| >30 Years | 6 | 1 | -- | 7 | 7 |

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Undescended testis.

About two-thirds of undescended testes were either at the superficial inguinal ring or at the distal part of the inguinal canal, while the other one-third was either arrested at the deep inguinal ring or intra-abdominal (Table 4).

Table 4: Locations of undescended testes

| Location | Number of cases (%) |
|-------------------------------|---------------------|
| Superficial inguinal ring | 24 (26%) |
| Canicular | 45 (48%) |
| Deep inguinal ring | 31 (23%) |
| Intra-abdominal | 3 (3%) |
| Total Number of Testes | 93 |

Out of 93 affected units, the palpable and non-palpable UDTs were 65 and 28 units (69.9% and 30.1% respectively).

The indications of orchiopexy or orchiectomy depend on the age of the patient at the time of surgery, and the physical and operative findings. The operative findings were as follows: grossly normal testes (n=74, 79.6%), and atrophied testes (n=19, 20.4%), so the surgical procedures performed for 93 undescended testes were orchiopexy (n=58), orchiopexy combined with ipsilateral hernial repair were (n=16) and orchiectomy for atrophied and grossly abnormal testes were (n=19), which represents 62.3%, 17.2%, and 20.4%, respectively.

All orchiectomies were performed because the undescended testes were atrophied; however, no evidence of malignant changes was detected. No bilateral orchidectomy was performed for any case presented with bilateral UDTs (Table 5).

Table 5: Time of surgery of patients with UDT

| Age Group | Testes | Orchiopexy | Orchiectomy |
|--------------|-----------|------------|-------------|
| ≤5 Years | 40 | 38 | 2 |
| 6-10 Years | 21 | 19 | 2 |
| 11-15 Years | 16 | 13 | 3 |
| 16-20 Years | 2 | 1 | 1 |
| 21-25 Years | 4 | 3 | 1 |
| 26-30 Years | 3 | -- | 3 |
| >30 Years | 7 | -- | 7 |
| Total | 93 | 74 | 19 |

Out of 74 UDTs underwent orchiopexy, the age distribution of cases was as follows: orchiopexy was done within 1 year (n=1), between 14 to 24 months

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(n=13) and older than 2 years (n=60), which represents 1.3%, 17.5%, and 81.08% respectively.

The oldest patient recorded to have UDT and underwent orchiectomy was 42 years old. Out of 75 cases of UDTs, there were 52 (69.4%) cases diagnosed

Table 6: Age at the time of diagnosis and surgery

| Age Years | Age diagnosis | | Age at surgery | |
|--------------|---------------|-----------|----------------|-----------|
| | At birth | Delayed | Within year | Delaye |
| ≤5 | 29 | 4 | 1 | 32 |
| 6-10 | 8 | 6 | -- | 14 |
| 11-15 | 8 | 5 | -- | 13 |
| 16-20 | 2 | -- | -- | 2 |
| 21-25 | 1 | 2 | -- | 3 |
| 26-30 | 2 | 1 | -- | 3 |
| >30 | 2 | 5 | -- | 7 |
| Total | 52 | 23 | 1 | 74 |

at birth and 23 (30.6%) cases discovered incidentally. Despite that, 52 cases were diagnosed at birth; only 13 (25%) cases were operated on within 2 years of life. The mean age at the time of diagnosis was 3.7 ± 8.3 years (Table 6).

After orchiectomy has been performed, the specimens were sent for histopathological examination and all results were negative regarding any malignant changes.

All patients who underwent orchiopexy had been instructed to perform periodic self-examination of affected side for early detection of any change in the size or consistency of the testes.

DISCUSSION

Undescended testis is a failure of the testis to descend into the scrotum. In our study we noticed that the right side was involved in 52.6% of cases of UDTs. This figure is almost similar to the findings in other studies which show that the involvement of right side was prominent [12]; however, bilateral UDTs were recorded in 18 (24%) cases. As compared with another study in which the percentage of palpable UDTs was 66.94 %, we found that 69.9 % of undescended testes were palpable [5]. However; out of 28 (30.1%) cases of non-palpable undescended testes were either because of testicular atrophy in 19, (20.4%) cases or because the UDTs were located intra-abdominally in 9 (9.6%) cases. Cryptorchidism may be associated with a hernia, retardation of testicular development, and hypospadias, as well as other urinary tract

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abnormalities [2, 5, 12-14]. In our study, inguinal hernia with or without pain was recorded in 7 (9.3%) cases. However, hernia sac in an asymptomatic patient was discovered during surgery in more than 50% of cases. Although cryptorchidism occurs in 2.4–5 % of newborns [15, 16], most of them descend spontaneously shortly after birth and the remaining (about 23 %) require active treatment [17]. The spontaneous descent of UDTs occurs in about 70 % of cases in the first 3-6 months of life [14, 18, 19]. After 6 months of life, the spontaneous descent of UDTs is unlikely to occur, and it may be enhanced by hormonal therapy (GnRH with or without β -HCG), which may lead to a 15-20% success rate [20]. However, the positive effect of hormonal therapy on the degree of paternity needs to prove [21]. No one of recorded cases in our series was known to receive hormonal therapy. The recommended age of orchiopexy has been decreased from age of 10 years (in a period from the 1950s to 1960s) to 1–2 years (in a period from 1990s to 2000s) [22]; however, the ideal age for correcting this anomaly has not yet been determined. Despite controversies regarding the time of surgery, there are some studies which recorded reasonable potential fertility when orchiopexy was done within the first year of life [23, 24], others report satisfactory results when the procedure is performed before the age of 2 years. [25, 26] However, performing of orchiopexy at the age between 6 and 12 months may prevent additional damage to the testes and may improve future fertility. [8, 11, 27, 28] In our statistical results, the mean age at the time of diagnosis was 3.7 ± 8.3 years, while the mean age at the time of surgery was 10.8 ± 10.3 years which were significantly higher than recommended age of surgery. [2] One follow-up study proves that semen parameters in young men who were operated on during 1st year of life were better than those operated during the 2nd year [6]. The other recent study found that when orchiopexy was performed at age of 9 months, the testicular growth is better than when the procedure was performed at the age of 3 years [23]. A part from paternity, there is no single direct measure that can predict future fertility of any patient who underwent orchiopexy at childhood [29]. However, there are various measures that may estimate post-orchiopexy fertility, like testicular size and histology at the time of orchiopexy, and semen analysis in adulthood [8]. These measurements may give clue about paternity rates and time to conception [30]. Miller et al noticed that in unilateral UDT, age at orchiopexy, and pre-operative testicular location or size

did not reduce fertility in later life [31]; however, its effect is worsened when the disease is bilateral [32]. The risk of malignancy increases when orchiopexy is performed in older age, [7, 33-35]. We recorded 7 cases of UDTs with age ranged ranging from 16 to 42 years, and no one of them was detected to have malignant changes. While the optimal age of orchiopexy is not identified, yet, the delayed orchiopexy beyond the international recommended age is still a worldwide problem. The factors for this delay are either due to delayed diagnosis or delayed referral or even due to the late ascent of previously scrotal sited testis [36]. In our study, we found that despite approximately two third of UDTs were diagnosed at birth, only 17.3% of cases were operated on at age ≤ 2 years old; however, only one patient was operated on at the age of 1 year. This figure indicates that there is a clear delay in presentation of the cases without any obvious explanation for this delay. However; in our community, the possible reasons of delayed presentation of UDTs are improper examination of external genitalia after delivery, inaccurate information given to parents or baby guardian regarding recommended timing of surgery, and improper translation of Latin medical terms to local language which may give misguided hope that the condition is simple and does not require early surgical intervention. According to our observations; a part of a delayed presentation of UDT was due to the negligence of parents or patient himself; the pediatricians and some urologists are also responsible for some delay because most of them do not follow international guidelines and recommendations. However, ascending testes or the 'acquired' UDT, which accounts nearly for one-fifth of patients who previously had palpable scrotal testes, may be considered as an additional reason for delayed orchiopexies [37, 38]. Secondary re-ascent of testes occurs in about 20% of cases of UDTs who received hormonal therapy [21]. Till now there is no adequate information regarding the correlation between infertility and a previously descended testis [39]. In our study, in the one-third of cases diagnosed incidentally at different age groups, we didn't know whether the condition was congenital or acquired because these patients did not have any information about their condition at the time of diagnosis. Despite published case reports, there is no clear evidence to support an increased risk of malignancy in ascending testes [40, 41]. However, international guidelines

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recommend performing orchiopexy as early as the diagnosis of ascending testes is confirmed [2, 9, 10].

CONCLUSION

Despite the fact that the new guidelines indicate that orchiopexy should be done as early as 6 months, and emphasizing that 18 months of life as the upper limit of optimal age for intervention, the mean age at of orchiopexy in our institution was significantly delayed beyond the recommended time of surgery, either because of delayed diagnosis or delayed referral. The recorded cases in our study represented only the tip of the iceberg.

RECOMMENDATIONS

In order to decrease delayed presentation of UDTs, we recommend the followings:

- Creating a new certificate of birth containing a medical check-up list including different congenital diseases in which the physical findings should be written whether positive or negative, to emphasize the incidence of acquired UDT (Ascending Testes).
- Improving the communication between pediatricians and urologists as well as the performance of continuous education of general practitioners.
- Implementation of the new guidelines of surgical intervention, and frequent examination of the external genitalia of male babies at the time of vaccination and at the age of school entry.
- Educating parents or baby guardians regarding advantages of early orchiopexy.
- Periodic public education regarding the risk of malignancy and infertility in these cases.

LIMITATION OF THE STUDY

Because of war in our city, our hospital closed for 3 years and the files which were reviewed were of the patient admitted to our institution in the period from 2011 to 2014.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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ملخص باللغة العربية

الخصيات المعلقة : توقيت الاحالة و وقت اجراء عملية تنزيل و تثبيت الخصية ، مركز جراحة المسالك البولية / بنغازي. ليبيا.

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الملخص

نبذة مختصرة: الخصية المعلقة هي خصية فشلت في النزول الي موقعها الطبيعي في كيس الصفن ويمكن تصنيفها علي حسب موقع توقف نزولها كالاتي؛ داخل تجويف البطن، في الحلقة الأربية العميقة، داخل القناة الاربية، أو منبثقة خلال الحلقة الأربية السطحية. تشخيص الخصية المعلقة يعتمد أساساً علي الفحص السريري و علاجها عادةً ما يكون جراحي جراحياً.

أهداف الدراسة: هدف دراستنا هو تحليل التوزيع العمري للمرضي وقت التشخيص والاحالة وكذلك وقت اجراء عملية انزال و تثبيت الخصية في كيس الصفن لتحديد ما إذا كنا نتبع التوصيات والتوجيهات الدولية في مؤسستنا بخصوص الخصية المعلقة ام لا.

الأساليب والمواد: أجريت هذه الدراسة بأثر رجعي في مركز الهوارى لجراحة المسالك البولية من خلال مراجعة ملفات 75 مريضاً متعاقباً ادخلوا للمستشفى خلال الفترة من يوليو 2011 إلى أبريل 2014. تم استخدام ورقة تدفق البيانات لتسجيل وتحليل البيانات الشخصية للمرضي ، عمر المرضي عند التشخيص، نتائج الفحص السريري، نوع التدخل الجراحي ، عمر المرضي وقت اجراء العملية و المشاهدات خلال التدخل الجراحية الجراحي.

الاستنتاجات: في مؤسستنا، يعتبر متوسط العمر عند اجراء عمليات انزال و تثبيت الخصية متأخراً بشكل ملحوظ عن الوقت الموصى به وذلك بسبب تأخر التشخيص واحالة الحالات أو تأخر اجراء الجراحة. تمثل الحالات المرصودة في الدراسة جزءاً بسيطاً من عدد الحالات الفعلي والتي لم تكتشف بعد وهي تمثل قمة جبل الجليد.

التوصيات: توصياتنا هي إنشاء شهادة جديدة للولادة تحتوي علي قائمة فحص طبية بخصوص مختلف التشوهات الخلقية، تحسين الإتصال بين أطباء الأطفال و اخصائيين امراض المسالك البولية، تطبيق التعليمات الجديدة بخصوص وقت التدخل الجراحي وإجراء الفحص الدوري للأطفال لإكتشاف أي حالات خصية معلقة مفتقدة أو مكتسبة ، التنقيف المستمر للاشخاص والجماعات بخصوص المرض.

التحليل الإحصائي: تم تفرغ البيانات السريرية، و اجراء التحليل الوصفي الإحصائي باستخدام SAS (JMP pro software) الإصدار 12.

الكلمات المفتاحية: الخصية الضامرة، الخصيتين المخفيتين، عمليات انزال و تثبيت الخصية ، الخصية المعلقة.

