Age at referral for undescended testes: has anything changed in a decade?
Mohit Bajaj, Vipul Upadhyay

ABSTRACT

AIM: Undescended testis (UDT) affects 1–6% of males and is one of the most common disorders in paediatric surgery. Updated consensus guidelines now recommend surgical management of UDT by 18 months. We compare the age at referral and subsequent timing of orchiopexy with data published from 1996–1998 at our institution, prior to the advent of updated guidelines.

METHODS: A retrospective review of all patients undergoing an orchiopexy for UDT from 2014 to 2016 was conducted. The age at time of first referral, first outpatient review and age at date of surgery were recorded. Calculations were made for time between referral and clinic visit (T-1) and between clinic visit and surgery (T-2). Data are reported as median (range).

RESULTS: In the 2014–2016 group (n=216), the median age at time of referral was 5.3 (range 0–182) months. Following referral, children were seen in the clinic at a median interval 1.84 (T-1: range 0.16–17) months. The median interval between the clinic visit and operation was 2.95 (T-2: range 0–30.7) months. The median age at time of surgery was 12.6 (range 4.6–191.3) months.

Compared to the data from 1996–1998 (n=325), there was a drop in the median ages both at time of referral (23 months vs 5.3) and at time of operation (38.8 months vs 12.6). In this cohort, 66% (n=143) of boys had surgery before eighteen months of age. The median times between referral and clinic visit (T-1: 1.7 months vs 1.84) and between clinic and operation (T-2: 3.3 months vs 2.95) were essentially unchanged.

CONCLUSION: Our second snapshot in time (2014–2016) shows improvements in median age at referral (under six months) and age at time of operation (at 12.6 months) when compared to the older snapshot (1996–1998). These timings are more in keeping with recommendations for orchiopexy.

Cryptorchidism or undescended testis (UDT) affects 1–6% of males at birth and is one of the most common disorders in paediatric surgery.1,2 Spontaneous descent of the testis occurs early in life, such that the overall incidence of congenital UDT is approximately 1% in males at one year of age.3

Undescended testis (UDT) represent the most common congenital anomaly of the urogenital system, and the association with malignancy and infertility, especially in bilateral cryptorchidism, is well described in the literature.4,6 Boys with UDT have an overall relative risk of 2.75–8 of testicular malignancy.4 In addition, multiple factors, including abnormal testicular development, reduced germ cell counts and anti-sperm antibodies, have been implicated in long-term fertility issues in cryptorchid males.5,6

Orchiopexy represents the current standard of care for UDTs. Timely placement of the testis in the scrotum has been shown to address the increased risks of malignancy and ensure optimal future spermatogenesis.5,6 Consequently, recommended age for operation has decreased over the last few decades (Figure 1)9–10 with updated consensus guidelines (Table 1) now advocating for surgical management of UDT by 12 to 18 months of age.11–13
The aim of our study is to compare the age at referral and subsequent timing of orchiopexy with data published from 1996–1998 at Starship Hospital, prior to the advent of updated guidelines.

**Methods**

Starship Children's Hospital provides paediatric surgical care for the Auckland region, as well as much of the northern half of the North Island in New Zealand. A retrospective review of children with undescended testes managed with orchiopexy at our institution in the period between January 2014 and May 2016 was performed.

Patients were identified from the theatre database using ICD-9 procedure codes for orchiopexy. Outpatient visit details and inpatient surgical management records were retrieved electronically. Data collected included patient’s demographics and clinical characteristics, age at time of referral, first outpatient review and age at orchidopexy.

Only patients with testes that were undescended at birth were included in our analysis. ‘Acquired’ UDT, testes that had been previously documented to be scrotal in position, were excluded. Patients who had their first surgery prior to 2014 were excluded from the study. In individuals who underwent a staged orchiopexy or a redo-procedure, only the first encounter was considered to avoid duplication.

Calculations were made for time between referral and clinic visit (T-1) and between clinic visit and surgery (T-2). This data was compared with data from a previous two-year period of orchidopexies performed at our institution between 1996–1998. Data are reported as median (range).

**Table 1:** Global consensus guidelines recommending early surgical management of UDT.

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Year</th>
<th>Age at referral</th>
<th>Timing of surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nordic Consensus Statement¹¹</td>
<td>2007</td>
<td>&lt;6 months</td>
<td>6-12 months old</td>
</tr>
<tr>
<td>American Urology Association (AUA) Guideline¹²</td>
<td>2014</td>
<td>&lt;6 months</td>
<td>Before 18 months old</td>
</tr>
<tr>
<td>British Association of Paediatric Urologists (BAPU) Statement¹³</td>
<td>2013</td>
<td>3-6 months</td>
<td>Before 12 months old</td>
</tr>
</tbody>
</table>

*Figure 1:* Schematic graph of recommended age for orchiopexy, showing a rapid fall in recent decades.

Results

The median age of children at the time of referral (Table 2) was 5.32 months. Following referral, children were promptly seen in a specialist clinic within a median wait time of 1.84 months (T-1). The interval between the clinic visit and the operation was a median time of 2.95 months (T-2). At operation, the median age of children was 12.63 months. In the current cohort, 66% (n=143) of boys had surgery before 18 months of age.

Our second snapshot in time (2014–2016) shows improvement in median age at referral (under six months) and age at time of operation (at 12.6 months) when compared to the older snapshot (1996–1998). The critical improvement comes from faster referral times from primary care doctors to specialists, allowing for improved adherence to international guidelines for orchiopexy.

Discussion

Orchiopexy should not be performed too early, as testes may descend spontaneously during the first few months of life.\(^{12}\) Updated guidelines released by key global paediatric surgical groups now recommend surgical management of UDT between 6–18 months of age,\(^{11,13}\) reflecting the growing body of evidence in the literature. The primary concerns regarding timing of surgery surround the impact of fertility of cryptorchid males and the increased risk of developing testicular cancer.

The effect of age at orchiopexy is more pertinent when considering the outcome of fertility. The most direct measure of male fertility is paternity rates and time until conception. These outcomes are difficult to assess clinically and previous research studies have used surrogate markers of fertility potential instead. These include testicular growth/size, histology at orchiopexy and semen analysis in adulthood. Histological changes such as reduced germ cell counts, Leydig cell depletion and delayed appearance of adult spermatogonia have been demonstrated in undescended testes as early as 1–2 years of age.\(^{5,15}\)

The exact mechanism linking cryptorchidism to testicular malignancy is unknown, although several risk factors have been proposed, including carcinoma in-situ and the increased temperature of the inguinal or abdominal region where the cryptorchid testis is located.\(^{6}\) Wood et al have noted an overall relative risk of 2.75–8 of malignancy in males with cryptorchidism.\(^{4}\) Similarly, performing orchiopexy earlier has been associated with a two-fold reduced risk of testicular malignancy compared to surgery performed post-puberty.\(^{7}\)

Unfortunately, the average age at orchiopexy seen in several studies from around the world remain higher than the recommended guidelines. Implementation of these guidelines has been analysed in studies throughout the world. Recent studies from New South Wales (Australia)\(^{16}\) and New Zealand\(^{17}\) have reported the median age of orchiopexy as 16.6 months and 31.1 months respectively. In another Australian study based in Victoria, up to 55% of boys had their surgery after the age of five, well beyond the presumed optimal age.\(^{18}\) Poor adherence to orchiopexy guidelines is also seen in European and American studies.\(^{19,20}\)

Several reasons have been put forth to explain this discrepancy, including failure of screening, lack of knowledge among primary care doctors, prolonged subspecialty referral waitlist times and parental reservations about early surgery.\(^{19}\)

\begin{table}
\centering
\caption{Median age of children with congenital UDT at referral, clinic visit and time of operation at Starship Children's Hospital.}
\begin{tabular}{|c|c|c|c|c|c|}
\hline
 & Median age at referral (months) & Median age at clinic visit (months) & Median age at operation (months) & Referral time to clinic T-1 (months) & Clinic to operation T-2 (months) \\
\hline
2014–2016 & 5.32 (Range: 0–182.2) & 8.16 (Range: 0.4–185.5) & 12.63 (Range: 4.6–191.4) & 1.84 (Range: 0–17.0) & 2.95 (Range: 0–30.7) \\
(n=216) & & & & & \\
1996–1998 & 23 (Range: 0–179.0) & 26.5 (Range: 0.5–180.6) & 38.8 (Range: 0.5–181.3) & 1.7 (Range: 0–16.9) & 3.26 (Range: 0–57.1) \\
(n=325) & & & & & \\
\hline
\end{tabular}
\end{table}
particular problem with UDT has been the multiple changes in guidelines that have transpired in a fairly short period of time, thus placing a burden on community paediatricians and general practitioners to maintain current practices.

In our series, the improvement in median age at surgery was primarily attributable to earlier primary care referral for surgeon assessment (5.32 vs. 23 months). A possible reason for this improvement could stem from increased awareness among general practitioners and paediatricians of the sequelae of untreated UDT.

Another possible reason could be the early identification of undescended testes during the ‘well-child’ checks conducted by Plunket nurses. Plunket nurses review more than 90% of newborns in New Zealand annually. The nurses have paediatric-specific education and skills and the ‘well-child’ checks provide an ideal screening opportunity for early detection of UDT.

Conclusion

Our second snapshot in time shows a considerable improvement in both age at referral and age at surgery from the data reported over a decade ago. This is primarily attributable to an earlier age at initial referral. Our data shows that we fulfil the criteria outlined by international bodies for the management of undescended testes.

References:


