Journal of Pediatric Urology (2017) xx, 1.e1–1.e5

Contralateral metachronous undescended testis: Is it predictable?

Madeline Cancian [a], Pamela Ellsworth [b], Anthony Caldamone [a]

[a]Department of Urology, Warren Alpert Medical School, Brown University, Providence, RI, USA

[b]Division of Urology, Nemours Children's Hospital, Orlando, FL, USA

Correspondence to: M. Cancian, 2 Dudley Street, Suite 174, Providence, RI 02903, USA, Tel.: +1 207 522 6718; fax: +1 401 444 6947

madelinecancian@gmail.com (M. Cancian)

Keywords
Undescended testis; Retractile testis; Acquired undescended testis

Received 22 November 2016
Accepted 9 March 2017
Available online xxx

Summary

Introduction
Metachronous undescended testis (mcUDT), an acquired UDT after contralateral orchiopexy, can occur in some boys. If one were able to predict its occurrence, one might consider a proactive approach or at least one would be able to counsel the parents accordingly. Our hypothesis was there may be characteristics evident at the time of initial orchiopexy which could predict the development of contralateral mcUDT.

Objective
The aim was to Identify factors present at initial orchiopexy that predict development of subsequent mcUDT.

Study design
Subjects were identified using the Current Procedural Terminology code for inguinal orchiopexy (54640). We included patients from January 1997 to October 2015. We included patients who underwent orchiopexy for unilateral UDT (uUDT). The study population consisted of patients who had undergone metachronous orchiopexies; controls were patients who were 17 years at time of data collection with a single orchiopexy. Cox proportional hazard regression was used to model the relationship between possible predictors of subsequent UDT using PROC PHREG with SAS Software 9.4.

Results
From 1035 eligible patients we identified 38 with mcUDT and 207 controls (uUDT). Median age at the first orchiopexy of mcUDT patients was 2.5 years (min/max, 0.50/10.4 years) and 8.2 years (min/max 0.70/12.8 years) for uUDT, $p < 0.0001$. Subjects with a contralateral retractile testis on preoperative exam had a 4.2 times higher rate of subsequent UDT than patients with a contralateral descended testis (95% CI 2.077–8.353). The rate of mcUDT was 6.7 times higher if the testis was a retractile testis under anesthesia (95% CI 2.7–16.5) (Table).

Discussion
Contralateral retractile UDT was a significant predictor of mcUDT. We believe patients with a contralateral retractile testis at time of orchiopexy should be counseled on bilateral orchiopexy. The risks of complications with orchiopexy should be weighed against risks of a subsequent surgery and anesthesia event.

Conclusion
A discussion of risks and benefits regarding bilateral orchiopexies should be undertaken with the parents prior to surgery in the setting of an UDT with contralateral retractile testis.

Table Patient characteristics and predictors of mcUDT.

	Contralateral UDT (38)	Unilateral UDT (204)	*p*
Age at initial orchiopexy, years	2.5	8.2	<0.0001
Congenital, %	65	52	0.10
Contralateral examination in office (% retractile)	52	18	<0.0001
Contralateral examination under anesthesia (% retractile)	22	2	<0.0001
Ipsilateral PV open, %	48	59	0.14

PV = processus vaginalis.

http://dx.doi.org/10.1016/j.jpurol.2017.03.011

Introduction

The incidence of congenital undescended testis (UDT), defined as a testis that has not descended prior to 6 months of age, is stated to be 1% [1]. It is recommended that these boys undergo orchiopexy between 6 and 12 months of age [2]. A significant number of boys undergo orchiopexy after 2 years of age, a phenomenon that is being increasingly recognized as a consequence of acquired UDT and not a missed diagnosis of congenital UDT [3–6]. Acquired UDT is defined as an undescended testis in a boy with a prior documented descended testis on the ipsilateral side. Both types of UDT carry an increased risk of testicular cancer [7] and decreased fertility potential [8]. The exact mechanism of acquired UDT is not understood; however, it is thought to be a variant of congenital UDT [9,10] and thus should carry the same potential sequelae [11]. Although the incidence is unknown, some boys develop metachronous UDT, requiring two separate orchiopexies. Our hypothesis was there may be characteristics evident at the time of initial orchiopexy that might predict the development of contralateral metachronous UDT.

Methods

By database query using the Current Procedural Terminology code for inguinal orchiopexy (54640), we identified all patients with UDT between the dates of January 1997 and October 2015. We included all patients who underwent orchiopexy for the indication of UDT. We excluded patients who underwent orchiopexy for a testicular torsion or a contralateral orchiopexy in the finding of an ipsilateral testicular nubbin after inguinal exploration for UDT. We excluded all patients undergoing two-stage Fowler–Stephens procedures and patients with bilateral UDT at time of presentation. Through retrospective chart review we identified all patients who had undergone bilateral metachronous orchiopexy. Our control group comprised all patients who had undergone unilateral orchiopexy and were 17 years old at the time of data collection.

We then collected data on age, type of UDT (congenital vs. acquired), physical examination in the office and under anesthesia, surgical approach, and surgical findings. UDT was considered congenital if present at birth by physician examination or by parental or primary care report, and acquired if the patient had a previously documented descended examination in our system or if a parent reported previous descended status. On examination, the testis was considered descended if it was in the scrotum at the time of examination. A testis was retractile if it could be brought into the scrotum and stayed after fatigue of the cremaster muscle. Physical examinations were identified both during a preoperative office visit and intraoperatively under anesthesia and prior to the start of the procedure. The surgical approach included prescrotal, inguinal, or one-stage laparoscopic orchiopexy. Note was also taken if the Prentiss maneuver was needed. The location of UDT was classified as able to pull into the scrotum but did not stay (prescrotal), superficial pouch, inguinal canal, or non-plapable.

Because our center is the only pediatric urology one in the state, it was assumed that patients who had a prior orchiopexy for UDT would present to the same center if the contralateral testis ascended. With this is mind, we assumed that if a patient did not return, then they did not experience a contralateral UDT. Therefore, we right censored using time until their 17th birthday as "last known follow up" for controls. Seventeen was chosen as a conservative estimation of puberty and thus the point when secondary UDT could no longer occur. As a conservative effort, we removed all cases where first orchiopexy occurred over the age of 13; this was to allow a 4-year window by which a patient could experience a contralateral UDT. Data were collected and managed using REDCap electronic data capture tools hosted at our institution [12]. REDCap (Research Electronic Data Capture) is a secure, web-based application designed to support data capture for research studies, providing 1) an intuitive interface for validated data entry; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for importing data from external sources.

Cox proportional hazard regression was used to model the relationship between possible predictors of subsequent UDT using PROC PHREG with SAS Software 9.4. The time until orchidopexy was estimated using PROCLIFETEST.

Ethical approval

Institute Review Board approval was obtained through our institution for this study.

Results

We identified 1035 patients who were eligible for this study (Fig. 1). Of these patients, 50 had metachronous contralateral UDT (mcUDT) after initial orchiopexy, comprising 4.8% of the total UDT population. Among the remaining 985 patients, we identified 240 patients who were 17 at the time of data collection. We were able to obtain charts for 38 of the patients with mcUDT and 204 of the patients with unilateral UDT (uUDT) (Table 1).

Comparing the 38 mcUDT patients with the 204 uUDT patients, the median age at the first orchiopexy of patients who had a subsequent orchiopexy was 2.5 years (min/max 0.50/10.4) and 8.2 years (min/max 70/12.8) for those who did not ($p < 0.0001$) (Fig. 1).

The median time until subsequent orchiopexy in patients who developed a contralateral UDT was 3.5 years (95% CI 2.0–5.0 years). The median time between first orchiopexy and age of 17 for those who did not have a second orchiopexy was 8.9 years (95% CI 8.4–9.8).

Contralateral testicular examination was significantly predictive of a subsequent UDT ($p < 0.0001$). Specifically, subjects who had a retractile testis on preoperative physical examination had a 4.2 times higher rate of subsequent UDT than patients who had a descended testis (95% CI 2.077–8.353). In addition, contralateral intraoperative testicular examination was significantly predictive of a subsequent UDT, $p < 0.0001$. Specifically, subjects who had a retractile testis under anesthesia had a 6.7 times higher rate of subsequent UDT than patients who had a descended

Please cite this article in press as: Cancian M, et al., Contralateral metachronous undescended testis: Is it predictable?, Journal of Pediatric Urology (2017), http://dx.doi.org/10.1016/j.jpurol.2017.03.011