Outcome Analysis of Redo Orchiopexy: Scrotal vs Inguinal

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Purpose: Redo orchiopexy after previous surgery is technically challenging and requires skills and care to ensure preservation of cord structures. We report our experience with redo orchiopexy in children.

Materials and Methods: We retrospectively reviewed patients who had undergone redo orchiopexy between January 2004 and May 2015. Variables evaluated included primary procedure, type of redo procedure, operative time, shift of surgical route, operative and postoperative complications, and testicular location at last followup.

Results: A total of 3,384 orchiopexies were performed during the study period, with 61 children (1.8%) requiring redo orchiopexy. Mean ± SD patient age at redo orchiopexy was 6.4 ± 3.6 years (range 1.5 to 17.1) and average followup was 24.9 months (2.1 to 99.6). The primary surgical procedure preceding redo surgery was inguinal orchiopexy in 45.9% of the patients, scrotal orchiopexy in 13.1% and laparoscopy in 13.1%, and 27.9% of patients were status post inguinal surgery (hernia/hydrocele repair). Redo surgery was performed by inguinal approach in 33 patients, while 28 children underwent a scrotal approach. There was no statistical difference in intraoperative and postoperative complication rates for the 2 approaches ($p = 0.52$ and $p = 0.26$, respectively). However, there was a statistically significant difference in overall operative time between approaches ($p = 0.003$) with scrotal orchiopexy being significantly shorter (53.1 minutes) compared to inguinal orchiopexy (84.6).

Conclusions: Scrotal and inguinal orchiopexy appear to be viable in managing secondarily ascending testes, with the scrotal approach offering some advantage in terms of length of procedure.

Key Words: cryptorchidism, orchiopexy, postoperative complications, testis, urogenital surgical procedures

Abbreviations and Acronyms

T = testis

UDT = undescended testis

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Cryptorchidism, or undescended testis, is considered to be the most common congenital genital anomaly in males.[1] Consequently orchiopexy is among the most frequently performed pediatric urological procedures. Surgical treatment of the undescended testicle has historically consisted of inguinal orchiopexy.[2] Bianchi and Squire introduced the transscrotal technique in 1989.[3] The benefits of this technique are shorter operative time, less pain and cosmetically pleasing results.[4–6] This procedure has been successfully applied to primary (congenital) and secondary (acquired) cryptorchidism, communicating hydroceles and indirect hernias.[7]

The historical success rate of orchiopexy repair is about 90%, depending on preoperative testicular

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location and technique.[8] Iatrogenic cryptorchidism reportedly occurs in up to 2% of cases after hernia repair and 10% after primary inguinal orchiopexy, and is usually related to incomplete dissection of cord structures.[9]

Redo orchiopexy for UDT after previous groin surgery is technically challenging, and requires skills and care to ensure preservation of testicular function. The procedure usually involves a hazardous dissection inside the inguinal canal, where scar tissue encircles the testicular vessels, vas deferens and testis, and plane separation is generally difficult.

At our institution the inguinal and scrotal approaches have been applied for redo orchiopexy. We hypothesized that redo orchiopexy would be more difficult when performed through the same scarred incision. Thus, redo surgery via an inguinal approach would be more challenging than a scrotal approach if preceded by a previous inguinal operation, and vice versa. We report our experience with redo orchiopexy in children using 2 different approaches, inguinal and scrotal, and compare clinical outcomes.

MATERIALS AND METHODS

After obtaining research ethics board approval we retrospectively reviewed patients who underwent redo orchiopexy at a large volume pediatric hospital between January 2004 and May 2015. Charts were retrospectively reviewed for technique and operative outcome. Variables evaluated included primary procedure, type of redo procedure, operative time, shift of surgical route, operative and postoperative complications, and testicular location at last followup. Nonpalpable and acquired undescended testes were excluded from the study. Acquired undescended testes were defined as testes that were documented at the bottom of the scrotum at least once after birth by a pediatric urologist at our institution but had subsequently moved from a satisfactory scrotal position.

Redo surgery respects the same principles of primary procedures, although it anticipates extensive fibrosis of the cord and inappropriate surgical management during the first operation (eg, inability to perform high ligation of processus vaginalis, inadequate fixation of testis, tethered cord). The principles of the inguinal approach refer to the technique as described by Hutcheson et al,[2] and the scrotal approach as described by Bianchi and Squire,[3] and Yucel et al.[10] Irrespective of the surgical route adopted, key points are dividing the internal spermatic fascia to separate the processus vaginalis from the vas and vessels, appropriate proximal ligation of the hernia sac and cremasteric muscle fiber division to free the testicle to gain adequate length, and a well performed orchiopexy at the lower portion of the scrotum. In redo cases extensive scar tissue surrounding the cord is generally present and finding a naive plane at the beginning of dissection is essential. Subsequently en bloc mobilization of the testis is performed circumferentially by the release of the fibrosis located around cord structures (fig. 1, *A* and *B*), followed by proximal dissection and separation of cord structures (gonadal vessels and vas deferens) and reassessment of adequate management of processus vaginalis, looking for an unrealized hernia sac, which should be ligated and allowed to retract (fig. 1, *C*). The aim is to fix the testis in the lower aspect of the scrotum (fig. 1, *D*).

Patients visited the clinic at least once by 3 months postoperatively to document the testicular position and size, and to ensure that no other complications had arisen. Testes were evaluated based on clinical notes, operative and postoperative remarks, and/or postoperative ultrasonography.

All values were presented as mean ± SD with range. Chi-square test was used to compare categorical variables and proportions. Independent sample t-test assuming unequal variances was used to compare means. Results were considered significant at a p value of less than 0.05.

RESULTS

A total of 3,384 orchiopexies were performed in the study period, with 61 children (1.8%) requiring redo orchiopexy. Primary surgery was performed at a mean ± SD age of 2.6 ± 2.5 years (range 30 days to 12.6 years). Of the patients 37 (60.7%) underwent primary surgery at our institution and 24 underwent the procedure elsewhere (39.3%).

Redo surgery was performed on the right side in 33 patients (54.1%), the left side in 24 (39.3%) and bilaterally in 4 (6.6%). Mean ± SD patient age at redo orchiopexy was 6.4 ± 3.6 years (range 1.5 to 17.1) and average followup was 24.9 months (2.1 to 99.6). Mean ± SD age at original surgery was 2.6 ± 2.4 years and time between the 2 procedures was 3.7 ± 3.4 years (range 0.3 to 13.1). The primary operation preceding redo surgery was inguinal orchiopexy in 28 patients (45.9%), scrotal orchiopexy in 8 (13.1%) and laparoscopy in 8 (13.1%), while 17 patients (27.9%) were status post inguinal surgery (hernia/hydrocele repair, fig. 2).

Redo surgery was performed by an inguinal approach in 33 patients and a scrotal approach in 28 (see table). Four attending pediatric urology surgeons from our institution were included for analysis. Operative approach was based solely on surgeon preference, with 2 using the scrotal approach for all redo orchiopexies and 2 using the inguinal approach.

There was no statistical difference in intraoperative ($p = 0.52$) or postoperative complication rates ($p = 0.26$) between the 2 approaches (see table). Identifiable factors contributing to primary surgery failure were patent processus vaginalis in 11 patients (18.1%), fibrosis of the cord in 34 (55.7%) and tethered short cord in 6 (9.8%). No identifiable factors were reported in 10 patients (16.4%). There was a statistically significant difference in overall