Primary and Reoperative Hypospadias Repair in Adults—Are Results Different than in Children?

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Abbreviations and Acronyms

BXO = balanitis xerotica obliterans

TIP = tubularized incised plate

Accepted for publication July 7, 2014.

Study received internal review board approval.

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† Financial interest and/or other relationship with Pfizer.

Purpose: There is widespread belief that hypospadias surgery in adults has a greater urethroplasty complication rate than similar repair in children. We compared outcomes of primary and reoperative hypospadias repair in adults vs children.

Materials and Methods: We evaluated prospectively maintained databases of consecutive boys and adults, defined as Tanner 4 or greater, treated with primary or reoperative hypospadias repair from 2000 to 2013. We searched for urethroplasty complications, including fistula, glans dehiscence, stricture/stenosis and diverticulum. All operations were done with the goal of creating a neomeatus at the normal location at the tip of the glans. Univariate and multivariate analyses were done to determine whether pubertal status impacted urethroplasty complications.

Results: A total of 1,140 patients were operated on by a single surgeon, including 69 adults with a mean age of 23 years. Complications developed in 209 cases (18%), including 124 of 883 primary repairs (14%) and 85 of 257 reoperations (33%). There was no difference in outcomes between adults and children. Complications were noted in 1 of 8 men (12.5%) vs 123 of 871 children (14%) with primary repair ($p = 0.9$) and in 16 of 61 (26%) vs 69 of 196 (35%) with reoperation ($p = 0.2$). Multivariate analysis showed that a proximal meatus and reoperation were risk factors for complications but not pubertal status.

Conclusions: In contrast to popular belief, our data do not indicate a greater risk for urethroplasty complications after hypospadias surgery performed in adulthood. Repair in adults can be done using the same techniques as in children with the same goal of a neomeatus at the tip of the glans.

Key Words: penis, urethra, hypospadias, adult, reconstructive surgical procedures

PRIMARY and reoperative hypospadias repairs in adults done using the same techniques as in children are reported to have a higher complication rate attributable to relatively decreased wound healing.[1] Consequently some men may be recommended for subglanular repair, especially to avoid staged procedures.[2]

Our surgical algorithm for hypospadias surgery is the same in prepubertal and postpubertal cases, including TIP, a 1-stage inlay graft or 2-stage graft repair. We previously analyzed results in consecutive prepubertal patients treated with primary or reoperative TIP and reported that urethroplasty complications were increased by a proximal meatal location and reoperation but not by increasing patient age.[3] We now present our series of postpubertal

0022-5347/14/1926-1730/0
THE JOURNAL OF UROLOGY®

http://dx.doi.org/10.1016/j.juro.2014.07.012
Vol. 192, 1730-1733, December 2014
Printed in U.S.A.

hypospadias operations and reoperations to determine whether pubertal status is an independent factor predicting urethroplasty outcomes.

MATERIALS

After obtaining internal review board approval we reviewed the records of consecutive patients who underwent primary or reoperative hypospadias repair as performed by one of us (WTS). At the time of treatment predetermined factors were prospectively entered into databases, including patient age, pubertal stage, meatal location, primary or reoperative hypospadias, surgical repair type (TIP, inlay graft or 2-stage graft), glansplasty suture (chromic vs polyglactin) and urethroplasty complications (fistula, meatal stenosis, neourethral stricture, glans dehiscence or diverticulum). Only patients with less than 1 month of followup were excluded from analysis. Adults were defined as Tanner 4 or 5.

In all operations the neourethra was carried to the tip of the glans with the intent to create an orthotopic neomeatus. TIP was performed in all primary cases unless ventral curvature greater than 30 degrees persisted after the penis was degloved and a ventral dartos flap was excised. In those circumstances a 2-stage procedure was done using prepuce or lower lip as the graft source depending on a preference for circumcision or preputioplasty, respectively.

Our method of decision making for reoperation was previously described.[4] Briefly, TIP was done when the urethral plate remained intact without gross scarring, and inlay grafting was performed when a skin neoplate was available without gross scarring. Two-stage oral mucosa grafting was done in patients with persistent ventral curvature greater than 30 degrees, gross scarring of the urethral plate, obliterative strictures or meatal stenosis that precluded inlay grafting, hair in the neourethra or BXO. Fistula closure without reoperative urethroplasty/glansplasty was not included in study.

The primary outcome variable was any urethroplasty complication, such as fistula, glans dehiscence, stricture, meatal stenosis, diverticulum and/or recurrent curvature greater than 30 degrees. Potential risk factors included age, pubertal status (less than Tanner 4 vs 4 or greater), meatal location, repair type, glans suture type and reoperation, which were analyzed by simple and multiple logistic regression analyses. Meatal stenosis was defined as calibration less than 8Fr in symptomatic boys and less than 12Fr in symptomatic men with stranguria, prolonged voiding and/or urinary retention. Glans dehiscence in all patients was defined as complete separation of the glans wings with or without a band of intervening skin that resulted in a coronal or more proximal meatus. Diverticulum was defined as visible sacculation of the urethra during voiding and/or urethrogram. All data were analyzed using SAS® 9.2 with $p < 0.05$ considered significant.

RESULTS

From 2000 to 2013 hypospadias repair was performed in 1,140 consecutive patients 3 months to 62 years old, including 883 (77%) primary operations and 257 reoperations (23%). Mean followup was 15 months (95% CI 13–16). Urethroplasty complications developed in 209 patients (18%), including 124 of 883 (14%) treated with primary repair and 85 of 257 (33%) treated with reoperation ($p < 0.001$). Of the patients 69 with a mean age of 23 years (range 13 to 62) were Tanner 4 or greater. Primary repair was performed in 8 patients, including proximal staged repair in 2 and distal TIP in 6 (fig. 1). There was a urethroplasty complication in 1 man (12.5%), that is a fistula after 2-stage repair. The urethral complication rate was similar in children who underwent primary repair (123 of 871 or 14%, $p = 0.90$).

The other 61 adults were treated with reoperations after up to 20 prior operations, including 19 TIPs, 14 inlay grafts and 28 staged oral grafts (fig. 2). There were 16 (26%) complications, including 8 fistulas, 5 glans dehiscences and 3 meatal stenoses, of which 1 was due to subsequent BXO. These complications in adults with reoperation were similar to those in prepubertal patients. Complications developed in 69 of 196 prepubertal patients (35%) ($p = 0.21$).

Multiple logistic regression revealed no increased risk of urethroplasty complications based on age or pubertal status (see table). Reoperation, a mid shaft meatus and a proximal meatus increased the risk of complications but suture type (chromic vs polyglactin) and surgery type (inlay or 2-stage graft vs TIP) did not.

DISCUSSION

We report a large series of men treated with hypospadias surgery. To our knowledge this is the only study comparing results in such men to those in prepubertal boys undergoing similar repair. Our analysis does not show that adults, defined as Tanner stage 4 or greater, were at increased risk

Figure 1. Appearance after primary TIP repair