Modified ASOPA Procedure (Hodgson XX) Achieves the Goals of Hypospadias Repair

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● Several vascularized island flap procedures have been described for the repair of severe hypospadias with chordee. The modified ASOPA (Hodgson XX) procedure, a variant of transverse island flap, employs an inner preputial skin tube for the neourethra while providing simultaneous skin coverage. Since 1988, more than 240 hypospadias repairs have been performed at the authors' institution, including 15 modified ASOPA procedures. All of the patients had proximal hypospadias with chordee. The follow-up of 12 of these patients showed a straight penis, free of chordee, with the meatus at the tip in 11 (92%). One patient had glanular separation and retraction of the meatus to a coronal position. No patient had a urethrocutaneous fistula or urethral diverticulum. Proximal anastomotic strictures were identified in three (25%) patients, which resolved with dilation in two and with internal urethrotomy in the other. The final cosmetic appearance was excellent for 11 patients. Based on these results, the authors conclude that the modified ASOPA procedure reliably achieves the goals of hypospadias repair: release of chordee, urethroplasty, scrotoplasty, and redistribution of skin coverage in one operation, with minimal morbidity.

INDEX WORDS: Hypospadias, ASOPA procedure, vascularized flap.

THE LARGE NUMBER of surgical techniques used for correction of hypospadias reflects the quest for a method that will achieve the goals of hypospadias repair: release of chordee, urethroplasty, glanuloplasty, and redistribution of skin coverage, in a cosmetically pleasing manner, with minimal morbidity. For more severe hypospadias, there are three surgical options: staged urethroplasty, single-stage free grafts such as those derived from preputial or extragenital skin or from buccal or bladder mucosa, and single-stage vascularized flaps. The more commonly employed single-stage vascularized flaps include transverse island preputial onlay, tubularized preputial, double-faced preputial, and S-shaped (oblique) preputial, or the ASOPA procedure. Modifications of the ASOPA procedure, most recently by Hodgson, have improved the cosmetic results. We review our results with this modified procedure (Hodgson XX) among 15 patients who had severe hypospadias and chordee.

MATERIALS AND METHODS

Since 1988, more than 240 hypospadias repairs have been performed at our institution, including 15 modified ASOPA procedures. The age range of the latter 15 patients ranged from 5 to 36 months at the time of surgical repair. The preoperative location of the hypospadiac meatus varied, and included midshaft (4), penoscrotal (6), proximal penile (4), and coronal (1). The patient with coronal hypospadias had a hypoplastic proximal urethra that required excision to the midshaft intraoperatively.

Surgical Technique

A suture is placed on the glans to allow for traction. A coronal circumcising incision is made, the penis is degloved, and the chordee is corrected. Sutures are placed in four quadrants of the preputial foreskin to allow for traction. A transverse island flap the length of the urethral defectis is developed and tubularized over a 7F silicone catheter in two layers (Fig 1A). Interrupted sutures of 6-0 chromic are used for the first layer; for the second, a running subcuticular layer of 7-0 Vicryl is employed. Minimal dissection is needed between the flap and the overlying skin. The prepuce is incised on a bias, avoiding the dorsal artery, yielding asymmetric flaps. Subcutaneous dissection performed down to the base of the penis to allow for rotation of the neourethra and overlying skin to the ventral surface, without penile torque (Fig 1B). The proximal anastomosis is established with interrupted 6-0 Vicryl sutures. A layer of vascularized tissue is placed over the proximal anastomosis and is tacked to the corpora laterally with 6-0 chromic. Glanular infiltration with 0.25% marcaine and 1:100,000 epinephrine is used for glanular hemostasis during dissection of the glans wings. The glans is incised in the midline, creating a channel for the neourethra, and glans wings are fashioned. The distal neourethra is placed into the glans channel and anastomosed to the tip of the glans with 6-0 interrupted chromic sutures. The glans wings are brought medially over the neourethra and anastomosed with a two-layer closure of 6-0 Vicryl. Ventral skin coverage is provided by the skin that overlies the neourethra (Fig 1C). The remaining dorsal skin flap will serve to cover the dorsum of the penis. Skin approximation is achieved with interrupted 5-0 plain gut sutures. A 7F silicone tube is passed through the neourethra into the bladder and is sutured to the glans with the previously placed traction suture. A sterile dressing is applied, and double-diaper drainage is employed. All patients are observed overnight, and the family is instructed regarding catheter management. The catheters and dressing are removed in the clinic 7 days postoperatively. All patients receive antibiotics until the catheter is removed.

RESULTS

The postoperative follow-up period of the 15 patients ranged from 1 to 87 months (average, 25.7 months). Three patients were lost to follow-up after their 1-month clinic visit and were excluded from data analysis. The neourethral length achieved ranged

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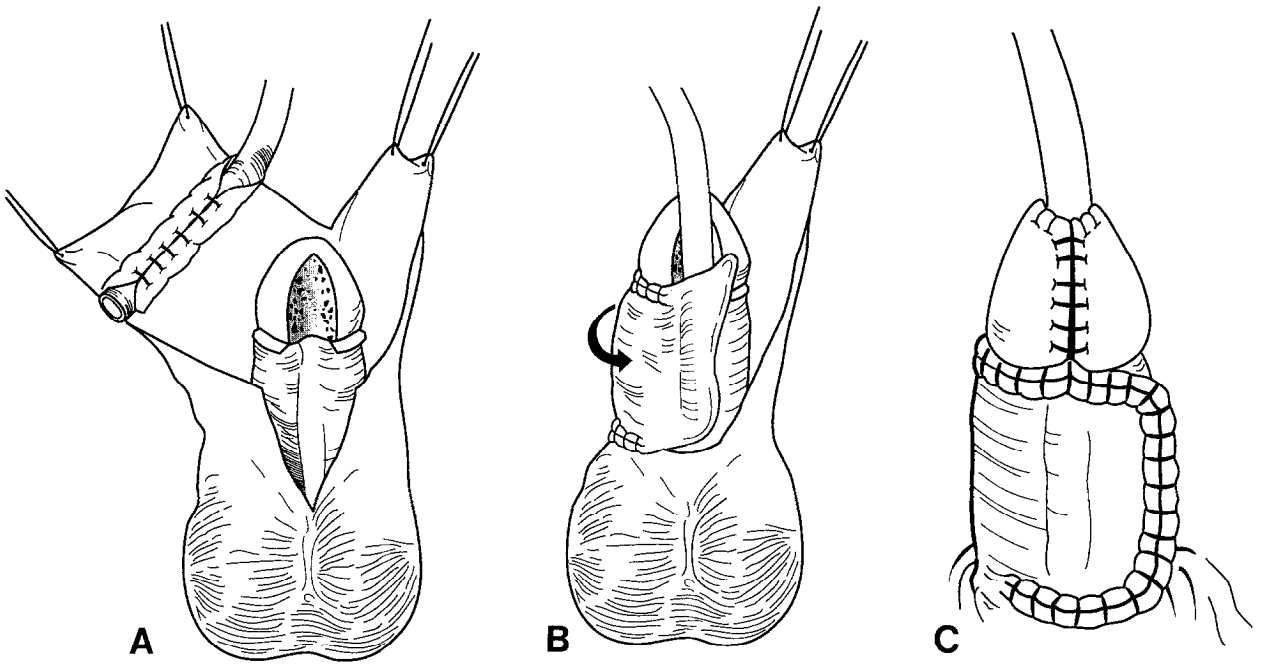

Fig 1. Modified ASOPA procedure (Hodgson XX): Surgical technique. (A) Creation of the neourethra. (B) The neourethra and overlying penile skin are translocated to the ventral surface. (C) Ventral coverage is provided by the skin that overlies the neourethra. (Illustrations by William R. Tucker.)

from 2.0 to 5.0 cm. Of the remaining 12 patients, 11 (92%) were noted to have a straight penis, free of chordee, with the meatus at the tip. One patient had glanular separation and retraction of the meatus to a coronal position. No patient had a urethrocutaneous fistula or urethral diverticulum. Three patients (25%) had proximal anastomotic urethral strictures, evidenced by difficulty passing an 8F sound in the clinic. Treatment consisted of urethral dilation in two patients and optical guided internal urethrotomy in one. They are currently stricture-free. The final cosmetic appearance is excellent for 11 patients, (92%) and no cases of penile torsion or persistent ventral fullness were identified.

DISCUSSION

A variety of surgical techniques are available for the repair of severe hypospadias with chordee.[1-5] The modified ASOPA procedure, a variant of transverse island flap, allows for the creation of an adequate-length neourethra while providing for simultaneous skin coverage.[6,7] Dissection of the flaps to the base of the penis avoids penile torque, thus providing excellent cosmesis. Initial ventral fullness has not been a long-term problem. The low incidence of fistulas may be attributable to the excellent vascularity of the neourethra and overlying tissue. In addition, the excellent neourethral support provided by the intact unit may decrease the incidence of postoperative diverticulum formation postoperatively.

The high incidence of strictures in the present series may reflect our initial method of evaluating postoperative stricture. In the earlier years of the study, a metal sound was passed via the urethra during follow-up visits to assess for stricture formation. Difficulties with passage of the sound were believed to be indicative of a possible stricture, and were evaluated further. Difficulties with calibration may have identified asymptomatic strictures, which otherwise would have gone unnoticed.

Currently, in older children, we are performing postoperative uroflow studies. As with any technique for hypospadias repair, the key to a successful operation is proper patient selection. The ideal patient is one with severe hypospadias, for whom a vascularized island flap procedure is considered. This procedure may be particularly suited for patients in whom the vascular supply of the prepuce appears suspect.[6] The individual must have an adequate amount of dorsal penile skin. Excessively nobby, bulky, irregular foreskin is a contraindication to this procedure and may predispose to problems with ventral fullness. Glans splitting and mobilization yield excellent cosmetic and functional results, but may result in subsequent glanular separation and meatal retraction.

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