Penopubic Flaps Technique for the Repair of Epispadias With or Without Exstrophy: A Preliminary Report

By Adnan Abasyanik, Haluk Güvenç, and Burhan Köseoğlu
Konya, Turkey and Istanbul, Turkey

- Six patients (average age, 2½ years; range, 4 months to 8 years) with the exstrophy-epispadias complex and isolate epispadias were treated using an alternative method. An inverted U-shaped incision (with a length of approximately 3 to 5 cm and a width of approximately 0.7 to 1.0 cm) was prepared, extending from the penopubic urethral meatus toward the umbilicus. The two incisions were extended along the urethral plate toward the ventral face of the glans. The pubic flap was prepared from the skin or scar tissue on the pubic area. The neourethra was reconstructed using penopubic flaps. A fistula occurred in one patient, which healed spontaneously. The penopubic flaps enabled us to form a wide-enough urethral tube and to perform a better dissection on the pubic area.

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THE EXSTROPHY-EPISPADIAS complex occurs approximately once in every 30,000 live births; epispadias alone is even more rare. The surgical management of patients with anomalies of the exstrophy-epispadias complex is difficult. According to the literature, satisfactory cosmetic and genital results after correction of epispadias have been achieved in only 50% of male patients. Dorsal curvature, fistulas, and stenosis have been major problems noted during follow-up.

MATERIALS AND METHODS

We treated six patients with epispadias (five of whom had the exstrophy-epispadias complex) between November 1992 and December 1994. At the time of epispadias repair, the age range was 4 months to 8 years. The exstrophied bladders were primarily closed, using paraexstrophy skin flaps, approximately 18 months before the epispadias repair.

Surgical Technique

An inverted U-shaped incision that extended toward the umbilicus from the sides of the penopubic urethral meatus (3 to 5 cm × 0.7 to 1.0 cm) was prepared as a flap on the pubic area. This was formed from the skin or the smooth-faced scar tissue. A second U-shaped incision was made along the urethral plate, toward the ventral face of the glans, as an extension of the former incision (Fig 1A). Both flaps extending to and from the penopubic urethral meatus were mobilized and carefully freed so that they were thick enough to preserve their vascular supply. They are actually random flaps maintaining blood supply from their bases. In this manner, we prepared two separate pubic and penile flaps, starting from the penopubic urethral meatus at the base (Fig 1B). In patients with the exstrophy-epispadias complex, the proximal flap was formed using the pubic scar tissue in reconstruction because it was quite smooth-faced and free of hair follicles (Fig 2). In the patient with isolated epispadias, the proximal flap was prepared using the skin.

The corpora cavernosa were dissected from distal to proximal on the dorsum of the penis. This dissection was extended toward the anterior pubic rami, with careful preservation of the neurovascular band. The corpora cavernosa were freed from the anterior/inferior pubic rami. The suspensory ligaments were excised. The pubic and penile flaps were sutured in onlay fashion using 6-0 polydioxanone interrupted sutures over a 10F to 12F catheter after correction of the dorsal chordee (Fig 1C). The neourethra was embedded along the lengthened corpora cavernosa, which were then sutured to each other (Fig 1D). Buck's and dartos fasciae were sutured in the midline. The glans wings were closed over the neourethra, and the skin was repaired (Fig 1E). The catheter was kept in place for 12 to 20 days. During this period, ceftriaxone (75 mg/kg/d) was administered parenterally.

RESULTS

Patients were monitored to assess for fistula development and other complications. In one patient a fistula developed on the 12th postoperative day, after removal of the catheter. The fistula healed spontaneously 2 weeks later. We were able to pass a 10F catheter in each case. The average follow-up period was 36 months (range, 15 months to 4 years).

The use of paraexstrophy skin flaps enabled us to obtain a urethral length of approximately 2 to 3 cm in patients with exstrophy. Five patients were continent and micturated at will. The cosmetic appearance of the penis was acceptable for the parents (Fig 3).

DISCUSSION

Surgical reconstruction of the exstrophy-epispadias complex is performed using staged procedures. Lengthening of the penile body is important in the staged repair. The urethra and penile body are lengthened during primary closure of the bladder by use of the paraexstrophy skin flaps and by closing the gap between the pubic bones after innominate osteotomy.

Epispadias repair usually is performed after 2.5 year; however, it has been postulated that earlier repair may result in higher bladder capacity. Monfort et al operated on some of their patients when they were 4 to 6 months old. The penile reconstruc-
Fig 1. (A) Penopubic flaps (1, pubic flap; 2, penile flap). The penile flap incisions are extended along the urethral plate toward the ventral face of the glans. (B) The penopubic flaps are mobilized carefully. (C) Formation of the neourethra from the penopubic flaps. The corpora cavernosa are mobilized from the anterior/inferior pubic rami. (D) The neourethra is embedded along the lengthened corpora cavernosa. (E) The glans wings are closed over the neourethra, and the skin is repaired.

section procedure that includes excision of chordee and repair of epispadias is referred to as orthoplasty by Brzezinski et al. The aim of epispadias repair is to maintain a penile body of sufficient length to enable the patient to live with a continent and properly functioning urogenital system. In addition to classical procedures, the penile body may be lengthened using V-Y plasties and rhomboid flaps prepared from the penopubic area, or by excising the scar tissue using Horton’s W incision.

With our technique, other than tumescent tube repair, the neourethra is formed using the penopubic flaps, resembling the onlay method. The use of the penopubic flaps enabled us to form a sufficiently wide urethral tube and to perform a better dissection on the pubic area (Fig 1C); this resulted in a longer penile body. Brzezinski et al suggested extensive dissection at the dorsal penopubic junction if scar tissue tethered the corpora cavernosa, and this should include the urethra if it is shortened and involved in
The penopubic flaps technique may be considered for the repair of epispadias (with or without exstrophy) because it provides sufficient penile length, a wide-enough urethral tube, and a low complication rate.

REFERENCES

Editorial: Penopubic Flaps Technique for the Repair of Epispadias With or Without Exstrophy: A Preliminary Report

The authors have proposed a technique for epispadias repair that defies all surgical principles for healing and plastic surgery concepts for flap development. They describe a 3- to 5-cm by 0.7- to 1.0-cm-wide flap in the penopubic area, made from scarred tissue from previous surgical reconstructions. They like this because the scar was “quite smooth-faced and free of hair follicles.” Then they take a perfectly healthy urethral plate and dissect it free from the corporal bodies, devascularizing it for its distal extent. These two flaps are sewn together as a urethral tube laid between the corporal bodies after lengthening. Their results are quite satisfactory, without fistula formation or slough of the flaps, despite such defiance of good plastic surgery practices.

There have been a number of recent advances in epispadias repair. The Cantwell-Ransley procedure (CREP) involves a similar radical separation of the corporal bodies, leaving the urethral plate connected proximally to the pubic urethra and distally to the glans. Tubularization of the urethral plate permits the urethra to traverse the penis ventrally in a more normal position. The results with this technique have been gratifying (authors’ reference no. 12). Mitchell (J Urol 155:300-304, 1996) has an even more radical approach. With the Mitchell epispadias procedure (MEP) the urethral plate is completely freed from its distal glanular attachment, all the way back to the pubic area, and tubularized. The glans is split down the midline, and both corporal bodies are completely freed. Rotational reconstruction is done to correct the dorsal curvature. The urethra is tubularized and brought back into an intraglanular position. His results with a short series and short follow-up also are impressive.

I see no reason why the authors’ technique should require a dorsal penopubic flap of scar tissue as an onlay to the urethral plate. This adds only width to the tube, which should be satisfactorily achieved by tubularizing the urethral plate entirely. They have added the radical dissection of the urethral plate from the corporal bodies and shown that this has survived, a lesson in surgical defiance and “res ipsa loquitur.”

I would not attempt such a procedure, but it must be saying something to us.

John W. Duckett
Children’s Hospital of Philadelphia
Philadelphia, PA