Corporeal Body Grafting Using Buccal Mucosa for Posterior Hypospadias With Severe Curvature

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Abbreviations and Acronyms

SIS = small intestinal submucosa

Study received institutional review board approval.

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Purpose: Severe penile curvature correction by corporeal body grafting has been successfully performed using various grafts and biomaterials. We present our initial experience with buccal mucosa as a free corporeal graft to correct severe penile curvature as part of a multistage approach to posterior hypospadias repair.

Materials and Methods: A total of 12 children with a mean age of 6.2 years (range 4 to 8) with posterior hypospadias and severe ventral chordee (greater than 45 degrees) necessitating ventral grafting underwent correction using buccal mucosa. Preoperative androgen supplement was given when penile and glanular size was significantly small for age. Buccal mucosa was harvested from the inner side of the cheek or the lower lip. The harvested graft was defatted, fashioned and fixed to the ventral corporeal defect. The pre-grafting penile angle, immediate post-grafting angle and penile angle at 6 months were assessed.

Results: All children had penoscrotal or perineal hypospadias, 4 had partial androgen insensitivity syndrome and 1 underwent multiple previous failed repairs. Androgen was given preoperatively in 3 children. After chordee release and urethral plate transection the penile angle was between 45 and 80 degrees. Mean graft length and width was 2.5 and 1.6 cm, respectively. All children had a straight penis at the end of the procedure and none required additive dorsal plication. At the last followup at 12 months all children had a straight penis except 2 with mild curvature (less than 10 degrees). No complications were noted with this technique.

Conclusions: Preliminary results of the novel use of buccal mucosa as a corporeal graft for severe chordee appear satisfactory. Longer term followup is needed to further document these data.

Key Words: penis, urethra, hypospadias, transplants, mouth mucosa

Severe penile ventral curvature is often associated with proximal hypospadias. Persistent curvature after penile degloving and resecting dysgenetic chordee tissue is usually due to corporeal disproportion. In this situation there is a discrepancy between dorsal and ventral corporeal body length with a shorter ventral surface of the corpora cavernosa.

A popular approach to correct the disproportion is to shorten the longer dorsal surface of the corpora cavernosa. Nesbit corrected penile curvature by shortening the dorsal side.[1] Baskin et al popularized dorsal midline plication.[2] An alternative approach is to augment the shorter ventral tunica by inserting a graft or a flap to add extra penile length rather than shorten an already modest organ by plication or resecting the dorsum. Several natural and synthetic materials are currently popular, including dermal graft,[3,4] tunica vaginalis graft,[5,6]

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tunica vaginalis flap[7–9] and single or 4-layer SIS.[10–13]

Buccal mucosa has been used for urethral reconstruction in proximal and complex hypospadias cases. Buccal mucosa free grafts show good graft uptake and minimal shrinkage.[14] We present our initial experience with a free buccal mucosa graft for ventral corporeal body grafting as part of a multistage approach to posterior hypospadias repair.

PATIENTS AND METHODS

A total of 12 children 4 to 8 years old (mean age 6.2) presenting with perineal, scrotal or penoscrotal hypospadias were included in the study. Four patients had androgen insensitivity and 2 had scrotal transpositions. Testosterone hormone therapy with 2.5% testosterone locally was given in 3 patients.

Intracorporeal injection of prostaglandin E[15] using an insulin syringe into the glans penis to induce stable pharmacological rigid erection was performed. Artificial pharmacological erection was done to assess curvature degree and angle, and facilitate anatomical dissection planes. Prostaglandin was washed out after cavernostomy. During surgery and after complete degloving of the penile skin the urethral plate and underlying corpus spongiosum were extensively mobilized from the corpora cavernosa and transected. Extensive resection was performed of fibrous chordee at the ventral corporeal surface. When chordee persisted, we planned a buccal mucosa corporeal graft to correct chordee. The pregraft corporeal angle was measured during erection with a protractor and compared to angle immediately after grafting.

A transverse incision was made at the point of maximal curvature on the ventral surface of the tunica albuginea. The incision extended lateral to incorporate each corporeal body, extending from the 3 to the 9 o'clock position. A tourniquet was fixed at the base of the penis to avoid profound bleeding during corpus cavernostomy. When troublesome bleeding occurred, hemostatic sutures were taken as needed to control bleeding. Careful distal and proximal dissection was done to lift the tunica albuginea off the underlying vascular tissue so that the transverse linear corporeal incision expanded to become a diamond-shaped defect. Midline dissection of intracorporeal tunica albuginea tissues at the upper and lower edges of the transverse corporotomy defect proximal and distal created a more relaxed, straight phallus.

Buccal mucosa was harvested from inner side of the check or lower lip. The harvested graft was defatted[13] and the graft was cut into a diamond shape. The graft was 25% larger than the corporeal defects. The buccal graft was secured in place at the corners and fixed to the corporeal defect bed. The defatted side was positioned to face cavernous tissue. Graft angles were fixed with 6-zero polyglycolic sutures. Graft edges were sutured to the edges of the tunica albuginea with watertight 6-zero running polyglycolic acid. Multiple 6-zero polyglycolic interrupted sutures were placed in the midline to the tough tissue of the septum to fix the graft to its bed and prevent future corporeal ballooning. We did not use pediculated dartos flaps for graft coverage after stage 1.

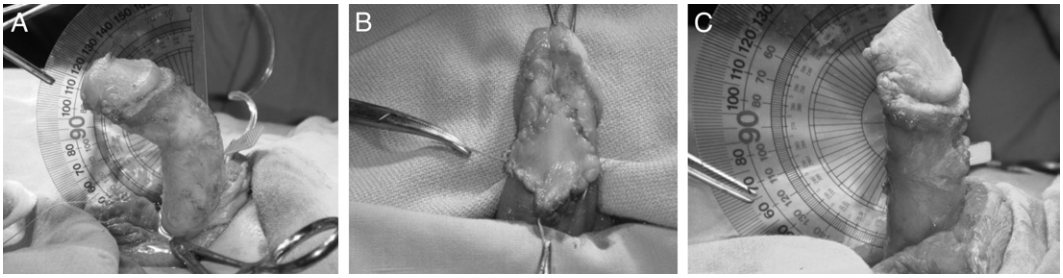
Skin coverage was completed in preparation for later stage 2 urethroplasty. A compression dressing was wrapped around the penis for 48 hours. Oral antibiotics were continued for 7 days postoperatively. At 6 months the stage 2 procedure was performed and the penile angle was reassessed. After 1 year the final penile angle was assessed by parents and the operator.

RESULTS

Buccal mucosa corporeal grafting to correct residual penile curvature was performed in 12 children, including 5 with penoscrotal, 5 with scrotal and 2 with perineal hypospadias. One child underwent multiple previous failed repairs. After chordee release and urethral plate transection the corporeal curvature angle during erection was between 45 and 80 degrees (mean 60) (part *A* of figure). All children had a straight penis at the end of the surgical procedure (0-degree angle) (parts *B* and *C* of figure).

Ten harvested grafts were from the inner side of the cheek and 2 were from the lower lip. Graft length was 1.7 to 2.9 cm (mean 2.5) after corporeal fixation and graft width was 1.2 to 2 cm (mean 1.6) after corporeal fixation. All patients received 1 graft.

All grafts were fixed to the ventral corporeal surface with no aneurysm at up to 1 year of followup. No patient underwent dorsal plication or other corrective surgery. No complications were noted due to



A, severe chordee after resecting all chordee tissue and urethral plate. *B*, buccal mucosa graft is sutured to defect in tunica albuginea ventral aspect. *C*, penis is straight after grafting.