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Penile Epispadias in Adulthood: A Case Report and Comprehensive Review of Surgical Techniques

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Abstract: Review Article

Background*:** Penile epispadias is an exceptionally rare congenital malformation, often diagnosed in infancy. Adult presentations are scarcely documented, posing unique reconstructive challenges. ***Case Presentation: A 44-year-old male with untreated penile epispadias underwent successful urethroplasty using the modified Cantwell-Young technique, with optimal functional and cosmetic outcomes at 10-month follow-up. ***Discussion***: We analyze the embryological basis, diagnostic pitfalls, and evolving surgical strategies for adult epispadias repair, emphasizing anatomic preservation and complication avoidance. ***Conclusion***: Delayed epispadias repair in adults is feasible with meticulous technique selection, though early intervention remains ideal to mitigate psychosocial and urologic sequelae.

Keywords: Epispadias, Adult Urology, Cantwell-Young Technique, Urethroplasty, Congenital Anomalies.

INTRODUCTION

Penile epispadias, a rare congenital anomaly of the urethral meatus, predominantly presents in infancy, with adult cases representing a diagnostic and therapeutic rarity. Despite extensive literature on pediatric epispadias repair, adult management remains poorly characterized due to delayed presentations and the paucity of reported cases. The embryological defect arises from aberrant development of the genital tubercle and cloacal membrane, leading to dorsal urethral displacement, corporal divergence, and variable urinary continence. Historically, surgical correction prioritized functional restoration, but contemporary approaches emphasize anatomic precision, cosmesis, and psychosocial outcomes. This study bridges critical gaps by: (1) presenting a successful adult repair using the Cantwell-Young technique, (2) providing a systematic review of surgical adaptations for mature anatomy, and (3) delineating strategies to address complications unique to delayed intervention. Our findings underscore the feasibility of adult epispadias repair while advocating for early childhood correction to avert long-term morbidity.

Case Report

A 44-year-old unmarried male presented with a lifelong dorsal urethral meatus (*Figure 1*). Despite prior consultations, no intervention had been performed. Clinical examination revealed:

- Ectopic urethral opening on the penile dorsum.

- Normal scrotal testes and no associated malformations.

Surgical Technique

Under general anesthesia, urethroplasty was performed via the Cantwell-Young approach:

1. **Incision and dissection:** A dorsal penile incision was made, preserving the neurovascular bundle.
2. **Urethral tubularization:** The plate was tubularized over a 12Fr catheter (*Figure 2*).
3. **Corporeal rotation:** The corpora cavernosa were approximated over the neourethra.
4. **Glanuloplasty:** The glans was reconfigured via triangular mucosal excision.

Outcome

The catheter was removed on postoperative day 12. At 10-month follow-up, the patient reported normal voiding and erectile function, with no fistulae or strictures (*Figure 3*).

Figure 1: Intraoperative photo showing urethral plate mobilization (arrow: vascular pedicle)

Figure 2: Corporeal rotation sutures (asterisks: corpora cavernosa)

Figure 3: Final glans configuration (arrow: neo-meatus)

DISCUSSION

1. Embryopathogenesis and Anatomical Considerations

Epispadias results from failure of dorsal urethral fusion due to abnormal development of the genital tubercle and cloacal membrane. Key embryological events include:

- **Week 4–5:** Faulty positioning of the mesodermal cloacal membrane.
- **Week 7–8:** Incomplete ventral migration of the urethral folds.

Why was our patient continent?

- Bladder neck integrity: Unlike penopubic epispadias (Type III), our case had no sphincteric deficiency.

2. Surgical Technique: Cantwell-Young Modification

Key Adaptations for Adults:

- **Corporeal rigidity:** Required careful neurovascular preservation.
- **Urethral plate mobilization:** Sub-tunical dissection to prevent necrosis.

3. Comparative Analysis of Techniques

Parameter	Cantwell-Young	Mitchell-Bagli
Fistula Rate	5–10%	10–15%
Cosmesis	Excellent	Good

4. Complications and Mitigation

- **Fistula prevention:** Two-layer urethral closure.
- **Stricture management:** Regular uroflowmetry.

5. Psychosexual Outcomes

- SHIM questionnaire: Score 22/25 (no dysfunction).

CONCLUSION

Penile epispadias, though rare, requires meticulous surgical planning. The Cantwell-Young technique offers durable functional and aesthetic results, even in delayed presentations. Early diagnosis and intervention remain paramount to reduce psychosocial morbidity.

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