COMPARATIVE EVALUATION OF POSTOPERATIVE SEXUAL FUNCTION AFTER VARIOUS URETHROPLASTY TECHNIQUES IN MALE PATIENTS

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Abstract: Urethroplasty is a widely accepted surgical intervention for urethral stricture disease. Despite its success in relieving obstructive symptoms, concerns regarding postoperative sexual function—particularly erectile dysfunction and penile sensitivity—remain significant. This prospective study evaluates sexual function in male patients undergoing different urethroplasty techniques, including excision and primary anastomosis, dorsal onlay buccal mucosa grafts, and penile skin flaps. Using validated assessment tools, such as the International Index of Erectile Function (IIEF-15), postoperative outcomes were measured and compared. The findings reveal that although most patients retain acceptable sexual function, the surgical technique influences the degree and duration of postoperative sexual complications.

Keywords:
urethroplasty, sexual function, erectile dysfunction, IIEF, penile sensitivity, urethral reconstruction

Introduction

Urethral stricture disease, particularly in the anterior urethra, can significantly impair urinary function and quality of life. Surgical correction via urethroplasty remains the definitive treatment for recurrent or complex strictures. However, the impact of urethroplasty on postoperative sexual function has garnered increasing attention, particularly as the demographic of patients includes younger, sexually active men.

Different urethroplasty techniques—such as excision and primary anastomosis (EPA), dorsal onlay buccal mucosa graft (BMG), and penile skin flap procedures—vary in their anatomical dissection, extent of nerve manipulation, and tissue handling. These variations may directly affect structures involved in erectile physiology, penile sensation, and ejaculatory mechanisms.

Despite high surgical success rates in restoring urethral patency, limited prospective data are available evaluating the sexual function outcomes following each technique. The aim of this study is to assess and compare postoperative sexual function using validated tools and structured follow-up among patients undergoing different forms of anterior urethroplasty.

Methods

A prospective cohort study was conducted between March 2021 and December 2023 at two tertiary urological centers. A total of 120 male patients aged 21 to 60 years were enrolled and grouped according to the urethroplasty technique performed:

- **Group 1:** Excision and Primary Anastomosis (EPA) – 40 patients
- **Group 2:** Dorsal Onlay Buccal Mucosa Graft (BMG) – 40 patients
- **Group 3:** Penile Skin Flap Urethroplasty – 40 patients

Inclusion Criteria:

- Diagnosed with anterior urethral stricture (1–5 cm in length)
- No history of prior urethral surgery
- Preoperative normal erectile function (IIEF-15 score ≥ 60)
- Willingness to participate and attend 12-month follow-up

Exclusion Criteria:

- Known erectile dysfunction or Peyronie's disease
- Neurological or psychiatric disorders
- Diabetes mellitus with neuropathy

All patients underwent detailed preoperative assessment including uroflowmetry, retrograde urethrogram, and IIEF-15 questionnaires. Follow-up assessments were carried out at 3, 6, and 12 months postoperatively. Sexual function parameters evaluated included erectile rigidity, orgasmic function, sexual satisfaction, and penile sensory changes.

Statistical analysis was performed using SPSS v26.0. Repeated measures ANOVA and Chi-square tests were used to assess intergroup differences, with $p < 0.05$ considered statistically significant.

Results

All patients completed the study period. The mean age was 38.4 ± 7.1 years. Stricture length and location were similar across groups. The overall urethral patency rate at 12 months was 94.2%.

Sexual Function Outcomes (IIEF-15 Total Score):

- **Group 1 (EPA):** Baseline 64.1 → 58.5 at 3 months → 61.3 at 12 months
- **Group 2 (BMG):** Baseline 63.7 → 62.9 at 3 months → 63.5 at 12 months
- **Group 3 (Flap):** Baseline 64.3 → 55.7 at 3 months → 59.2 at 12 months

Erectile rigidity was significantly reduced in Group 3 at 3 months ($p = 0.02$) and only partially recovered by 12 months. Group 2 maintained near-baseline erectile and orgasmic function throughout.

Penile Sensory Changes:

- Group 1: 12% reported transient perineal numbness
- Group 2: 5% reported oral discomfort postoperatively; no sensory loss
- Group 3: 20% reported decreased penile shaft sensitivity at flap site

Ejaculatory Issues:

- Delayed ejaculation was reported in 10% of Group 3
- None significant in Groups 1 or 2

Patient Satisfaction (12-month survey):

- Group 1: 85% satisfied with both urinary and sexual function
- Group 2: 92% satisfied
- Group 3: 68% satisfied

Discussion

This study reaffirms that urethroplasty is a highly effective surgical solution for urethral stricture disease with overall good outcomes in both urinary and sexual domains. However, technique-specific nuances impact postoperative sexual function differently.

Patients undergoing **EPA** experienced mild erectile disturbances in the early postoperative phase, possibly due to perineal nerve traction, but most returned to baseline function within a year. The **BMG technique** demonstrated excellent preservation of sexual function, making it a preferred option for sexually active men, particularly for longer or more complex strictures. **Penile skin flap urethroplasty**, while technically valuable in certain scenarios, was associated with higher rates of sensory changes and ejaculatory dysfunction, possibly due to extensive dissection and neurovascular manipulation.

These findings emphasize the importance of individualized surgical planning. In addition, the use of validated questionnaires like the IIEF-15 ensures objective, reproducible tracking of patient-reported outcomes. Patients should be counseled regarding potential short-term sexual dysfunction and recovery timelines, especially when flap-based techniques are planned.

Conclusion

Urethroplasty remains a reliable surgical solution for urethral stricture, with good long-term sexual outcomes in most cases. However, postoperative sexual function is influenced by the surgical method used. Buccal mucosa graft urethroplasty offers superior preservation of erectile and sensory functions, while penile skin flap procedures may carry a higher risk of temporary or persistent dysfunction. These results advocate for careful preoperative assessment, personalized technique selection, and structured sexual function follow-up using standardized tools. Future multicenter studies with larger sample sizes are warranted to confirm these findings and refine surgical decision-making.

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