Urethral Strictures after Endoscopic Urological Surgery

Review of Literature 2019–2025

Sources: PubMed, Scopus, Springer, AUA Guidelines

Introduction

- Urethral stricture is a known complication after endoscopic urological surgeries.
- Caused by scar formation and narrowing of the urethra.
- Leads to obstructive symptoms, recurrence, and need for repeated interventions.

Epidemiology

- Incidence after HoLEP: 1.5% (Taychert et al., 2025).
- Incidence after HoLEP: 1.9% (Elsaqa et al., 2022).
- TURP vs HoLEP: 7.9% vs 4.7% (Elsaqa et al., 2023).

Risk Factors

- Larger prostate size.
- Longer operative time.
- Intraoperative urethral trauma.
- Postoperative urinary tract infection (Hou et al., 2024).

Clinical Presentation

- Weak urinary stream.
- Incomplete emptying.
- Recurrent UTIs.
- May present months after surgery.

Diagnostic Methods

- Uroflowmetry.
- Cystoscopy.
- Retrograde urethrogram.
- Ultrasound urethrography (selected cases).

Endoscopic Management: Dilation

- Simple and widely available.
- Minimally invasive.
- High recurrence rate.
- Rarely curative.

Endoscopic Management: DVIU

- Direct Vision Internal Urethrotomy (DVIU).
- Initial success 50–70%.
- Recurrence common, especially with long strictures.
- Not recommended for repeated failures (AUA, 2023).

Endoscopic Management: Laser

- Holmium laser urethrotomy.
- Precise incision, less bleeding.
- Outcomes comparable to DVIU.
- Requires expertise and equipment.

Endoscopic Management: Balloon Dilation

- Systematic review (Li et al., 2024): success ~67%.
- Drug-coated balloon (paclitaxel) reduces recurrence.
- Minimally invasive alternative.
- Still under evaluation.

Novel Endoscopic Approaches

- Drug delivery adjuncts (steroids, mitomycin-C).
- Botulinum toxin injection post-DVIU (Mirjalili et al.,2024).
- Temporary urethral stents.
- Promising results but limited data.

Open Surgery: Urethroplasty

- Gold standard for recurrent or long strictures.
- Success rate: 80–90%.
- Techniques: Excision & anastomosis, grafts (buccal mucosa).
- Requires expertise in reconstructive urology.

Comparative Outcomes

- Dilation: fast but poor durability.
- DVIU: moderate short-term success.
- Balloon dilation: ~67% success.
- Urethroplasty: highest long-term cure rates.

AUA Guidelines 2023

- Do not repeat endoscopic treatment endlessly.
- Offer urethroplasty after recurrence.
- Endoscopic management suitable for short, first-time strictures.
- Individualized approach is necessary.

Complications of Treatments

- Recurrence of stricture.
- Urinary incontinence (esp. near sphincter).
- Erectile dysfunction (rare).
- Infection and bleeding.

Patient-Related Factors

- Age and comorbidities.
- Previous interventions.
- Stricture site (bulbar, penile, meatal).
- Patient preference.

Future Directions

- Drug-eluting stents.
- Bioengineered grafts.
- Stem cell therapy for tissue regeneration.
- Personalized surgical approaches.

Key Takeaways

- Strictures remain a challenge after endoscopic urology.
- Incidence ~1–9% depending on surgery.
- Endoscopic options: limited long-term efficacy.
- Urethroplasty: definitive treatment in recurrent cases.

Case Example (Study)

- Hou et al., 2024: 246 patients post-enucleation.
- 9.3% developed strictures.
- Risk factors: small prostate size, failed catheter trial.
- Importance of postoperative monitoring.

Summary

- Early diagnosis improves outcomes.
- Endoscopic treatment may be first-line.
- Urethroplasty is gold standard for recurrence.
- Continuous follow-up is essential.

References

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