Bladder outflow surgery

Choosing the right operation for the right patient

20-minute clinical update | Male benign prostatic obstruction (BPO)

20-minute clinical update

First: what are we treating?

Symptoms are not synonymous with obstruction

- Male LUTS may arise from prostate, bladder, urethra or systemic causes
- Confirm a plausible outlet target before offering outlet surgery
- Assess symptoms, flow, residual, prostate anatomy and complications
- Consider detrusor underactivity, overactivity and urethral stricture

When should we operate?

Absolute and relative indications

- Recurrent or refractory retention
- Recurrent UTI, bladder stones or diverticula attributable to BPO
- Upper tract dilatation / renal impairment due to obstruction
- Refractory prostatic bleeding
- Persistent bothersome LUTS despite, or unsuitable for, conservative and medical treatment

The decision is bigger than prostate volume

Five dimensions of procedure selection

- Anatomy: volume, median lobe, intravesical protrusion, bladder neck
- Patient: age, frailty, comorbidity, anticoagulation and anaesthetic fitness
- Priority: maximum de-obstruction, ejaculation, recovery or avoiding catheterisation
- Trade-offs: bleeding, continence, stricture, retreatment and sexual effects
- Service: equipment, surgeon experience, learning curve and follow-up

TURP: the reference operation

Resection for approximately 30–80 mL glands

- Monopolar or bipolar resection removes obstructing transition-zone tissue
- Strong, predictable improvement in symptoms and flow
- Bipolar TURP reduces dilutional hyponatraemia / TUR syndrome risk
- Trade-offs: bleeding, clot retention, catheterisation, retrograde ejaculation
- Late risks include urethral stricture and bladder-neck contracture

TUIP: small gland, tight outlet

Incision rather than tissue removal

- Best suited to prostate <30 mL without an obstructing middle lobe
- Incisions at the bladder neck/prostate reduce outlet resistance
- Shorter procedure; no resected tissue for histology

Enucleation: remove the adenoma

HoLEP, ThuLEP and bipolar enucleation

- Anatomical enucleation separates adenoma from the surgical capsule
- HoLEP has strong evidence and is largely size-independent
- Suitable for large glands; tissue can be morcellated and sent for histology
- Durable de-obstruction and low retreatment rates
- Learning curve, morcellation and transient stress incontinence are considerations

Vaporisation: tissue ablation

GreenLight and related laser techniques

- Laser energy vaporises obstructing tissue rather than retrieving it
- Useful haemostatic profile; may suit selected patients with bleeding risk
- Symptom and flow improvements are established
- No or limited tissue for histology, depending on technique
- Durability and retreatment depend on gland size, technique and experience

Aquablation: image-guided waterjet

A tissue-removing option with ejaculation data

- Robotically delivered high-velocity saline jet under ultrasound guidance
- Combines treatment planning with real-time visualisation
- Evidence supports symptom and flow improvement, including larger glands
- Randomised data show lower rates of ejaculatory dysfunction than TURP
- Bleeding control is essential; availability and cost vary

Minimally invasive options

Less invasive does not mean equivalent de-obstruction

- Prostatic urethral lift (UroLift): retracts lateral lobes; preserves ejaculation
- Water-vapour thermal therapy (Rezūm): causes delayed tissue necrosis and shrinkage
- Temporary implanted nitinol device (iTind): remodels prostatic urethra
- Generally faster recovery and lower sexual morbidity
- Usually less improvement in flow and/or greater retreatment than TURP/enucleation

PAE: an alternative pathway

Prostatic artery embolisation

- Performed by interventional radiology; reduces prostate perfusion and volume
- Can improve symptoms with less immediate surgical morbidity
- Typically less improvement in flow and objective obstruction than TURP
- Requires suitable arterial anatomy and experienced IR team
- EAU 2026: remains an option under investigation / not a routine substitute

What about the bladder neck and urethra?

Not all outlet obstruction is prostatic

- Primary bladder neck obstruction: consider bladder neck incision in selected men
- Urethral stricture: diagnose and treat the stricture, not the prostate
- Meatal disease / fossa navicularis disease requires site-specific treatment
- Neurogenic or functional obstruction needs a different pathway
- Do not perform prostate surgery without identifying the obstructing level

Counselling: make the trade-offs explicit

A practical comparison

- Most effective / durable de-obstruction: HoLEP or another established enucleation; TURP for suitable-sized glands
- Small gland: TUIP; 30–80 mL: TURP / enucleation / selected alternatives
- Large gland: enucleation; open/robotic simple prostatectomy if endoscopic enucleation unavailable
- Ejaculation priority: discuss UroLift, Rezūm or Aquablation in suitable anatomy
- Bleeding risk, frailty and anaesthetic fitness may change the balance

A simple procedure-selection framework

Start with anatomy, then patient priorities

- <30 mL, no median lobe → TUIP
- 30–80 mL → bipolar TURP, HoLEP / ThuLEP or selected alternatives
- >80 mL → HoLEP / anatomical enucleation; simple prostatectomy if unavailable
- Strong ejaculation-preservation priority → assess UroLift / Rezūm / Aquablation suitability
- Uncertain obstruction or weak bladder → reconsider diagnosis; consider urodynamics

Take-home messages

Five points to leave with

- Confirm that the symptoms are caused by outlet obstruction
- Match the operation to prostate anatomy and the level of obstruction
- TURP remains effective; enucleation offers size-independent, durable de-obstruction
- Minimally invasive treatments trade some efficacy/durability for recovery and sexual-function advantages
- Shared decision-making and local expertise are as important as the device

Selected references

Guidelines and landmark evidence

- EAU Guidelines on Non-neurogenic Male LUTS, 2026 – surgical treatment chapter
- NICE CG97: Lower urinary tract symptoms in men – management
- AUA Guideline Amendment 2023: Management of LUTS attributed to BPH
- WATER trial programme – Aquablation versus TURP
- PACE / L.I.F.T. and Rezūm pivotal and longer-term studies