

Surgical treatment of benign prostatic obstruction: resection and enucleation techniques

1. Resection of the prostate

Monopolar and bipolar transurethral resection of the prostate (M-TURP, B-TURP)

TURP removes tissue from the transition zone of the gland in various degrees resulting in a volume and PSA reduction of 25 -58%.

Bipolar- or M-TURP is the current standard surgical procedure for men with prostate sizes of 30-80 mL and bothersome moderate-to-severe lower urinary tract symptoms (LUTS) secondary of benign prostate obstruction (BPO).

Recommendation	Strength rating
Offer bipolar- or monopolar-transurethral resection of the prostate to surgically treat moderate-to-severe LUTS in men with prostate size of 30-80 mL.	Strong

Thulium:yttrium-aluminium-garnet laser vaporessection of the prostate:

Laser vaporessection of the prostate using Tm:YAG laser (ThuVAP) has similar operation, catheterisation and hospitalisation times compared to TURP. ThuVAP and TURP are equivalent in terms of IPSS and safety but not Qmax, with TURP deemed superior at twelve months follow-up.

Recommendation	Strength rating
Offer laser resection of the prostate using Tm:YAG laser (ThuVAP) as an alternative to TURP.	Weak

Transurethral incision of the prostate: Transurethral incision of the prostate shows similar efficacy and safety to M-TURP for treating moderate-to-severe LUTS secondary to BPO in men with prostates < 30 mL.

Recommendation	Strength rating
Offer transurethral incision of the prostate to surgically treat moderate-to-severe LUTS in men with prostate size < 30 mL, without a middle lobe.	Strong

2. Enucleation of the prostate

Open prostatectomy (OP): OP is the oldest surgical treatment for moderate-to-severe LUTS secondary to BPO. Obstructive adenomas are enucleated using the index finger, approaching from within the bladder (Freyer) or through the anterior prostatic capsule (Millin). It is used for substantially enlarged glands (> 80-100 mL). It is an effective and durable procedure, but it is the most invasive surgical method.

Recommendation	Strength rating
Offer open prostatectomy in the absence of anatomical endoscopic enucleation of the prostate to treat moderate-to-severe LUTS in men with prostate size > 80 mL.	Strong

Bipolar transurethral enucleation of the prostate:

Bipolar transurethral (plasmakinetic) shows favourable mid- to long-term efficacy compared to TURP and has a favourable peri-operative safety profile and demonstrates similar mid- to long-term safety compared to TURP.

Recommendation	Strength rating
Offer bipolar transurethral (plasmakinetic) enucleation of the prostate to men with moderate-to-severe LUTS as an alternative to transurethral resection of the prostate.	Weak

Holmium laser enucleation of the prostate:

Laser enucleation of the prostate using Ho:YAG laser (HoLEP) demonstrates similar mid- to long-term efficacy, similar safety but and longer operation times, but a more favourable peri-operative profile when compared to TURP.

Recommendation	Strength rating
Offer laser enucleation of the prostate using Ho:YAG laser (HoLEP) to men with moderate-to-severe LUTS as an alternative to transurethral resection of the prostate or open prostatectomy.	Strong

Thulium:yttrium-aluminium-garnet laser enucleation of the prostate: Enucleation of the prostate using the Tm:YAG laser (ThuLEP) demonstrates similar efficacy and similar safety when compared to TURP, bipolar transurethral enucleation and HoLEP. Vapoenucleation of the prostate using a Tm:YAG laser (ThuVEP) seems to be safe in patients with large prostates and those receiving anticoagulant or antiplatelet therapy.

Recommendations	Strength rating
Offer enucleation of the prostate using the Tm:YAG laser (ThuLEP, ThuVEP) to men with moderate-to-severe LUTS as an alternative to transurethral resection of the prostate, holmium laser enucleation or bipolar transurethral (plasmakinetic) enucleation.	Weak
Offer Tm:YAG laser enucleation of the prostate to patients receiving anticoagulant or antiplatelet therapy.	Weak

Diode laser enucleation of the prostate:

For prostate surgery, diode lasers are marketed for vaporisation and enucleation. Only a few have been evaluated in clinical trials.

Recommendation	Strength rating
Offer 120-W 980 nm, 1,318 nm or 1,470 nm diode laser enucleation of the prostate to men with moderate-to-severe LUTS as a comparable alternative to bipolar transurethral (plasmakinetic) enucleation or bipolar transurethral resection of the prostate.	Weak

Enucleation techniques under investigation:

- **Minimal invasive simple prostatectomy (MISP):** includes laparoscopic simple prostatectomy (LSP) and robot-assisted simple prostatectomy (RASP). They are feasible in men with prostate sizes > 80 mL needing surgical treatment; however, RCTs are needed.
- **532 nm ('Greenlight') laser enucleation of the prostate:** GreenLEP is an anatomical enucleation technique following the principle of blunt dissection of the adenoma with the sheath and laser energy for incision as described for ThuLEP. A variation is the in-situ vaporisation of apically enucleated tissue, also referred to as anatomic vaporisation incision technique. No high quality adequate RCTs have been carried out.