

Benign Prostatic Hyperplasia

(BPH)

Case Report

Medical History

Male, 65 years old

Weak urine stream of some time

Now feels the urge to urinate, but cannot pass urine

What do you ask the patient?

medical history

Weak urine stream?

urgency?

Delayed start of urination?

Prolonged urination?

Dribbling, feeling of incomplete emptying?

Frequent urination?

Nocturia?

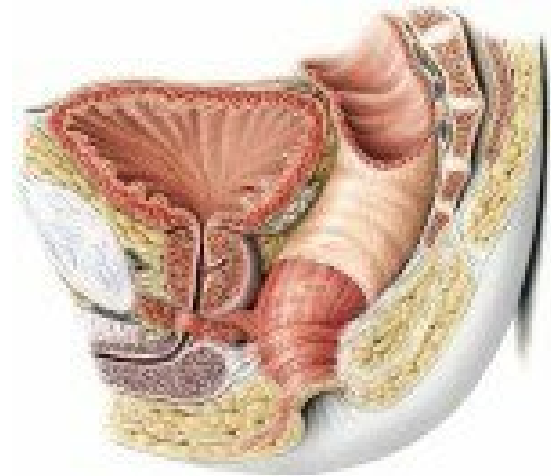
Preliminary diagnosis

Benign Prostate syndrome (BPS)

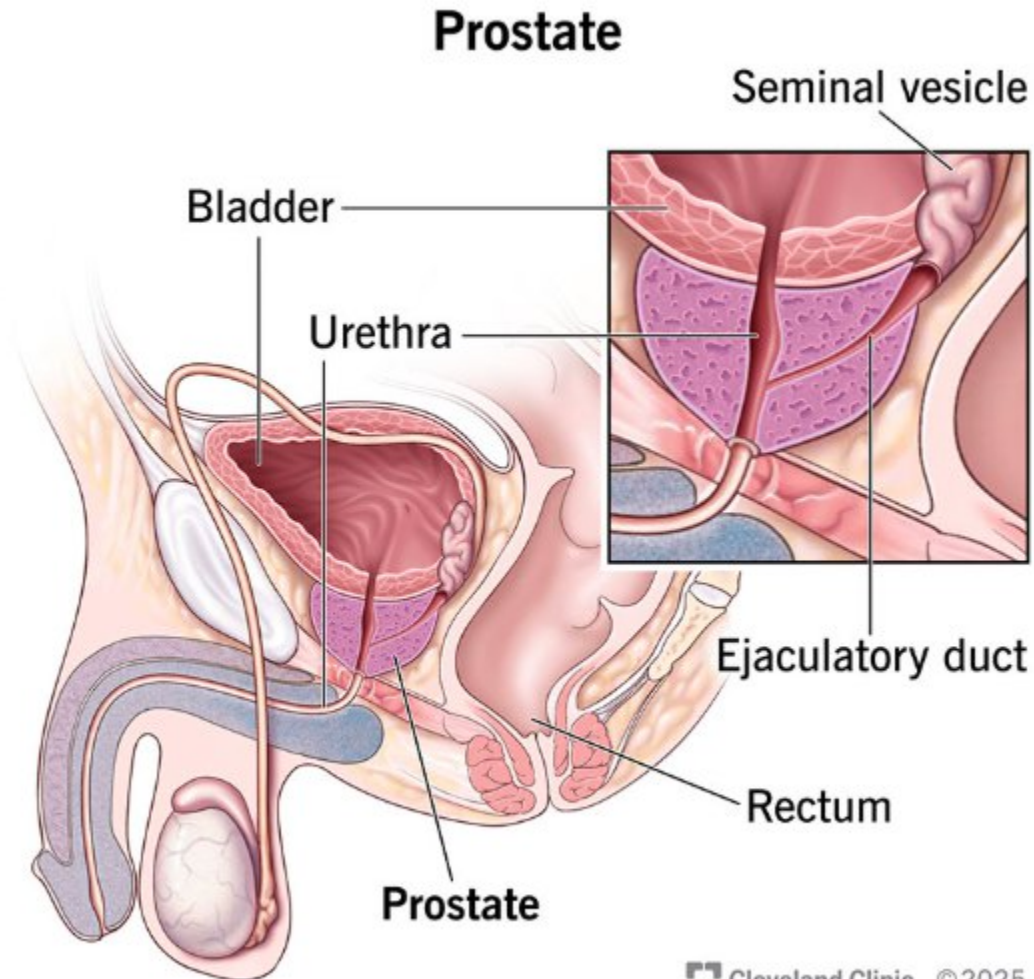
Benign **P**rostatic **E**nlargement

Bladder **O**utlet **O**bstruction

Lower **U**rinary **T**ract **S**ymptoms

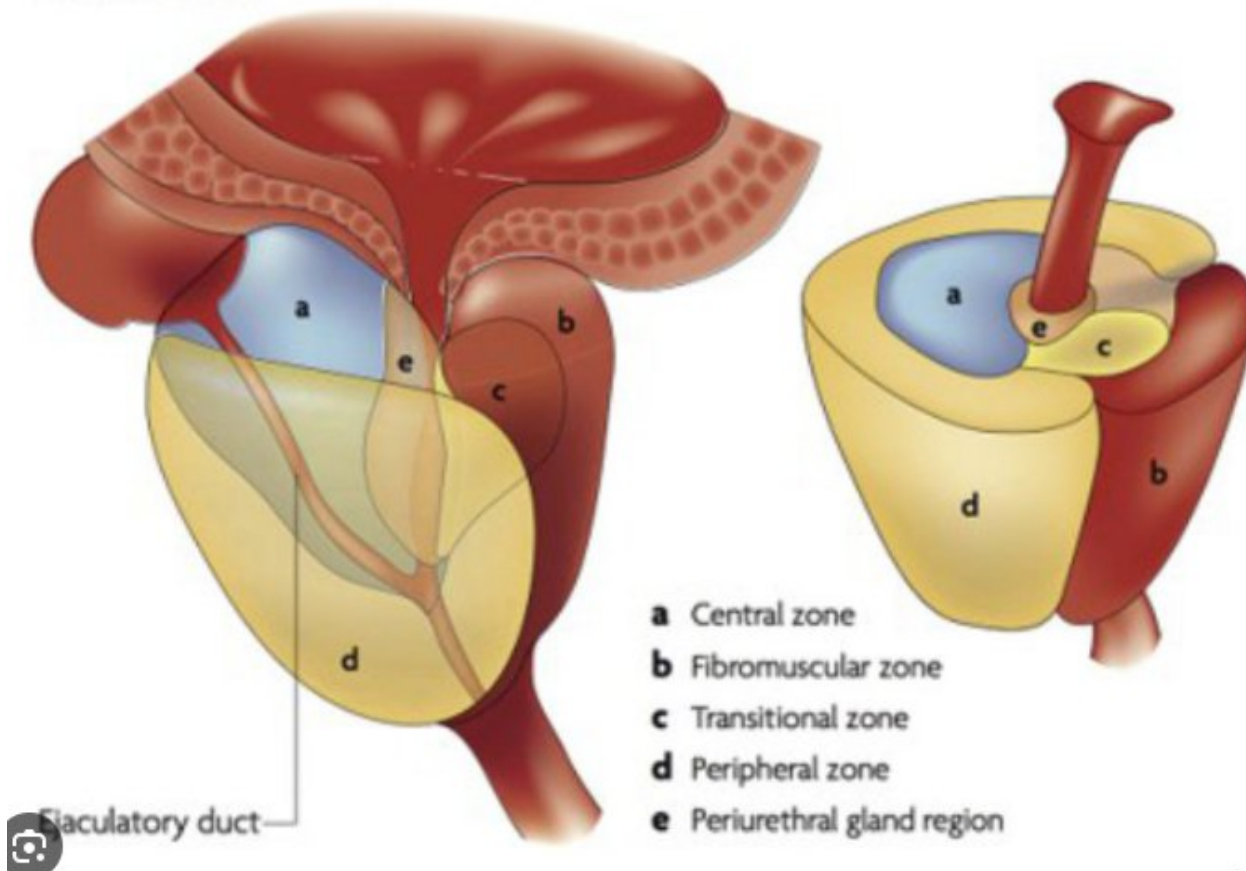


Anatomy of prostate

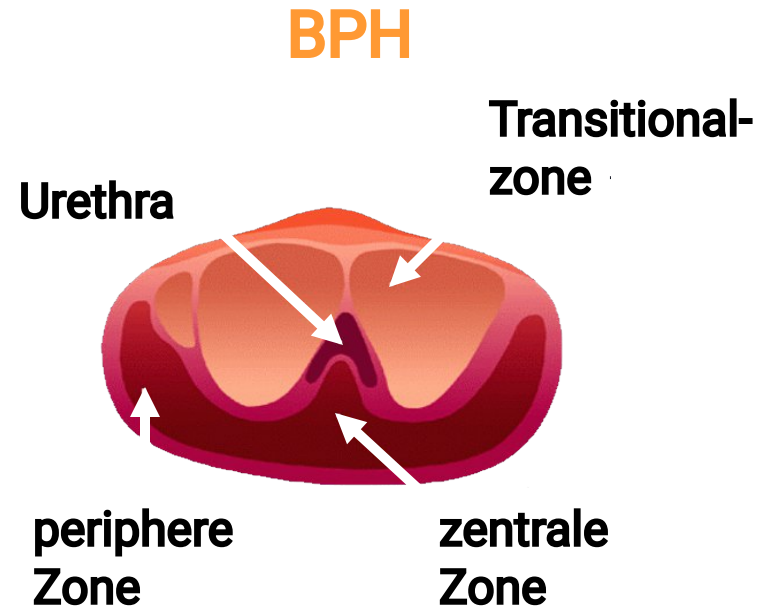
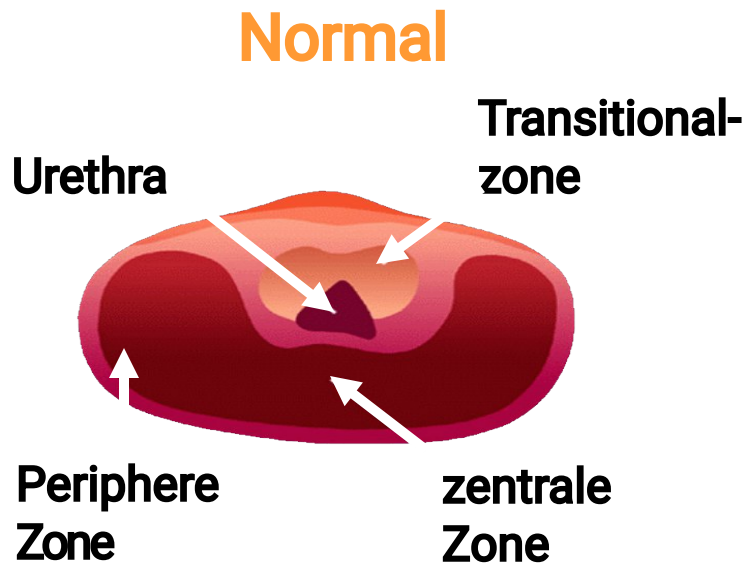


anatomy of prostate

Prostate zones

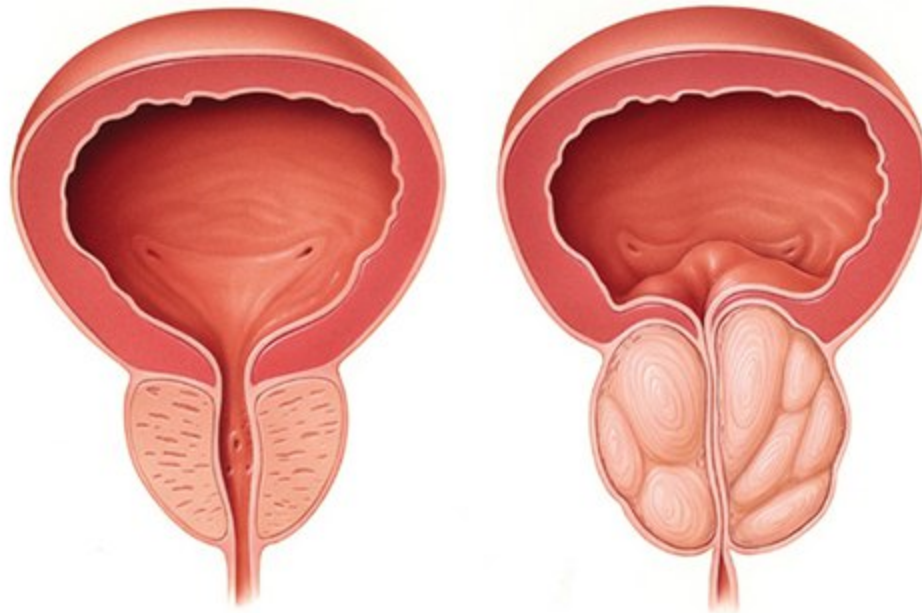


Zonal origin of BPH



The typical location of BPH nodules is the transitional zone
The central and peripheral zones are pushed to the periphery

prostate enlargement



Normal Prostate

Enlarged Prostate

Definition:

BPH is a non-cancerous enlargement of the prostate gland common in aging men.

Pathophysiology overview:

Hyperplasia of epithelial and stromal cells within the prostate transition zone.

Dihydrotestosterone (DHT) role via 5-alpha-reductase converting testosterone to DHT.

Age-related hormonal changes affecting prostatic growth.

Risk factors:

Advancing age (most common after 50)

Family history of BPH

Obesity and metabolic syndrome

Hormonal changes with aging

Key contributing factors:

Androgen signaling and balance (testosterone, DHT, and estrogen interactions)

Growth factors and cytokines (e.g., IGF, TGF- β) promoting cellular proliferation

Prostatic stromal-epithelial interactions in the transition zone

Genetic predisposition (family history, potential polygenic influence)

Inflammation and chronic prostatitis-like processes in some patients

Vascular and tissue remodeling changes with aging

Note:

BPH is not cancer; it is a normal age-related condition with variable progression.

Clinical relevance:

Prostate enlargement can lead to lower urinary tract symptoms (LUTS) due to bladder outlet obstruction.

BPS symptome

Obstructive symptoms

Weak urine stream
Delayed onset of urination
Prolonged urination time
Dribbling
Residual urine
Urinary retention
Overflow bladder/incontinence
Urinary stasis/renal insufficiency

Irritative symptoms

Pollakisuria
Urge to urinate
Urge incontinence
Nocturia

Diagnostic procedures

Medical history

Standardized questionnaires

Digital rectal examination

Urinalysis

Laboratory tests

Creatinine, urea, electrolytes, PSA (prostate specific antigen)

Sonography

Residual urine, hydronephrosis, bladder trabeculation, bladder diverticula, stones

TRUS (transrectal ultrasound)

Optional diagnostic tests:

Endoscopy/cystoscopy (for hematuria/urolithiasis/stricture)

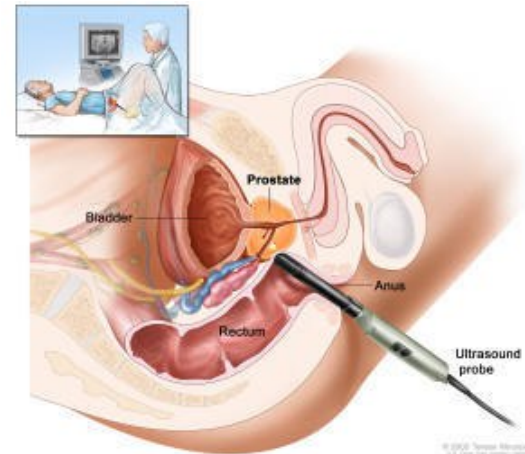
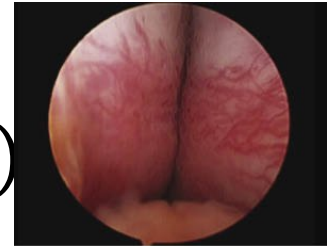
Urodynamic examinations:

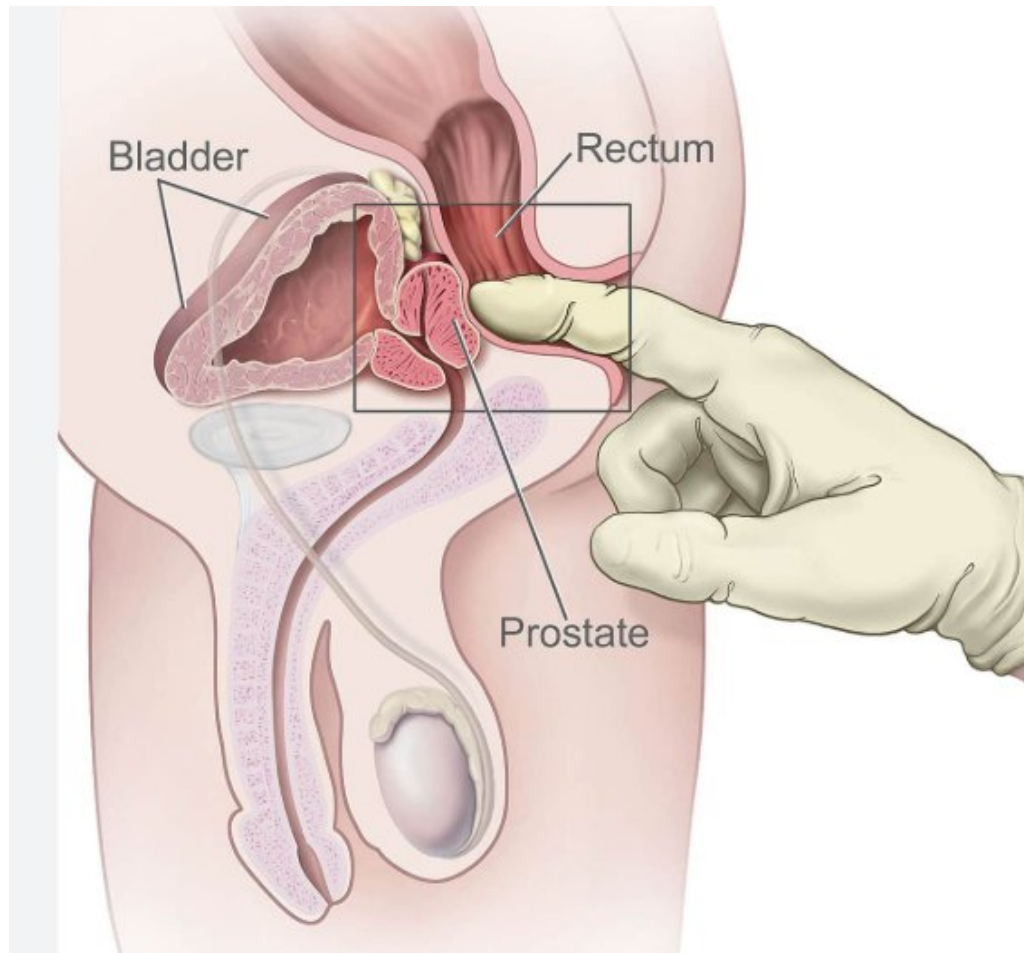
Uroflowmetry

Urodynamics

Prostate biopsy,

MRI guided biops





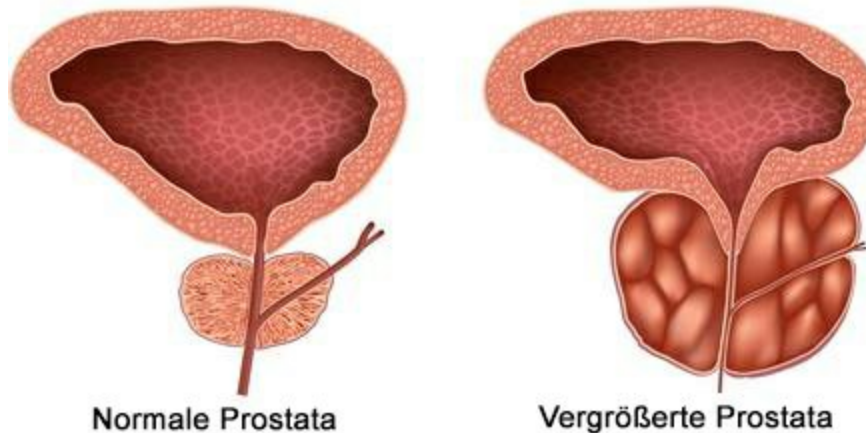
Benign prostatic hyperplasia

The middle lobe protrudes into the bladder

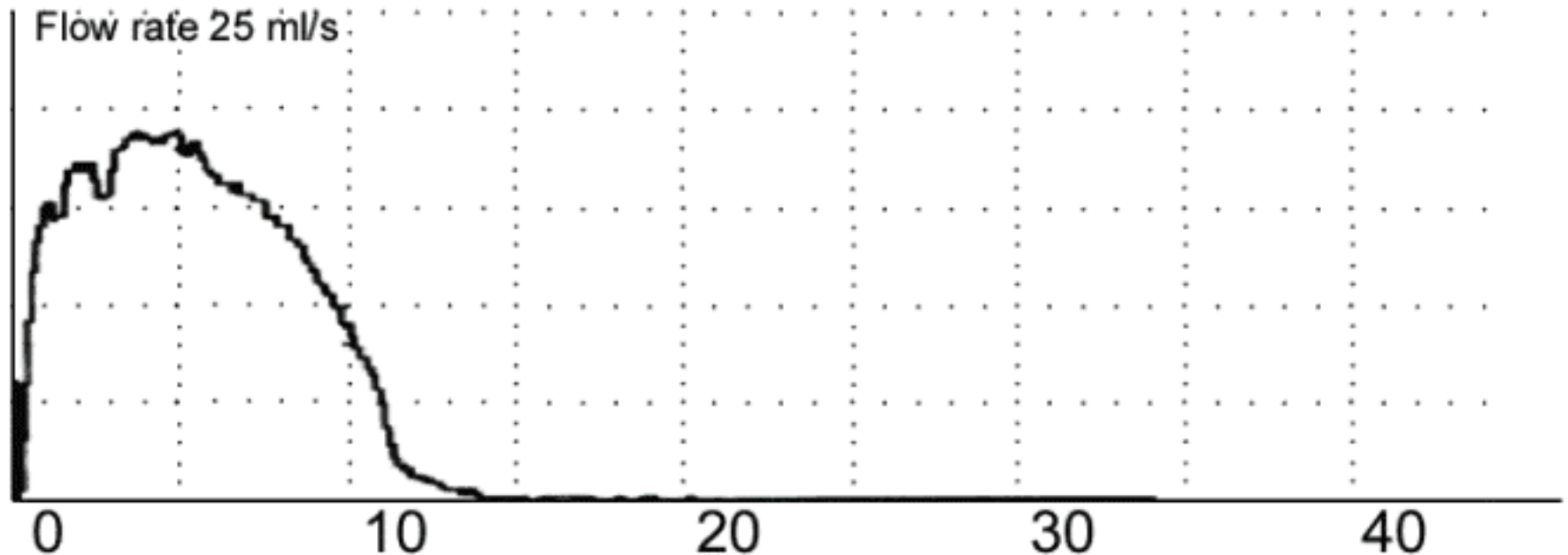
The prostatic urethra narrows

This leads to trabeculation and thickening of the bladder wall

Benigne Prostatahyperplasie



Uroflowmetry: not obstructed

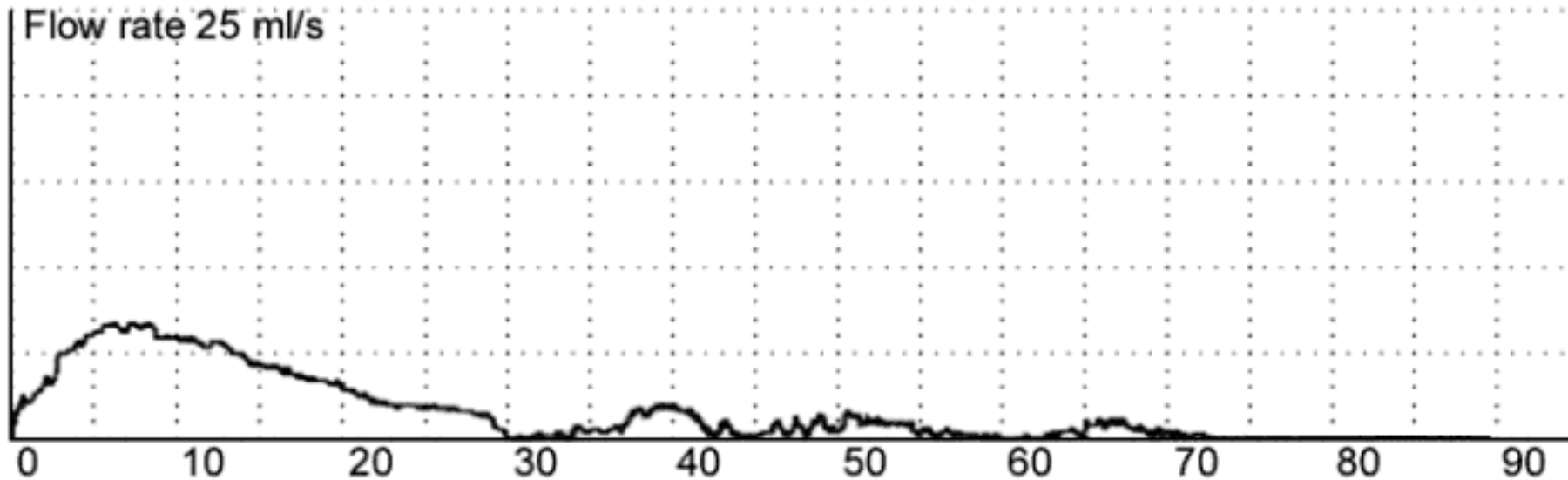


70-year-old
mannormal flow
pattern

Urination time
Flow time
Time until max,
Max. flow rate
average flow rate
Urine output

T_{100}	13.5 s
TQ	12.5 s
$TQ_{\max}$	4.8 s
$Q_{\max}$	18.5 ml/s
Q_{ave}	12.2 ml/s
V_{comp}	158.0 ml

Uroflowmetry: Obstruction



70-year-old man

Obstruction due to BPH

Maximum flow rate

Prolonged voiding time

Voiding time

Flow time

Time to max. flow

Max. flow rate

Average flow rate

Voided volume

T_{100} 68.0s

TQ 48.5s

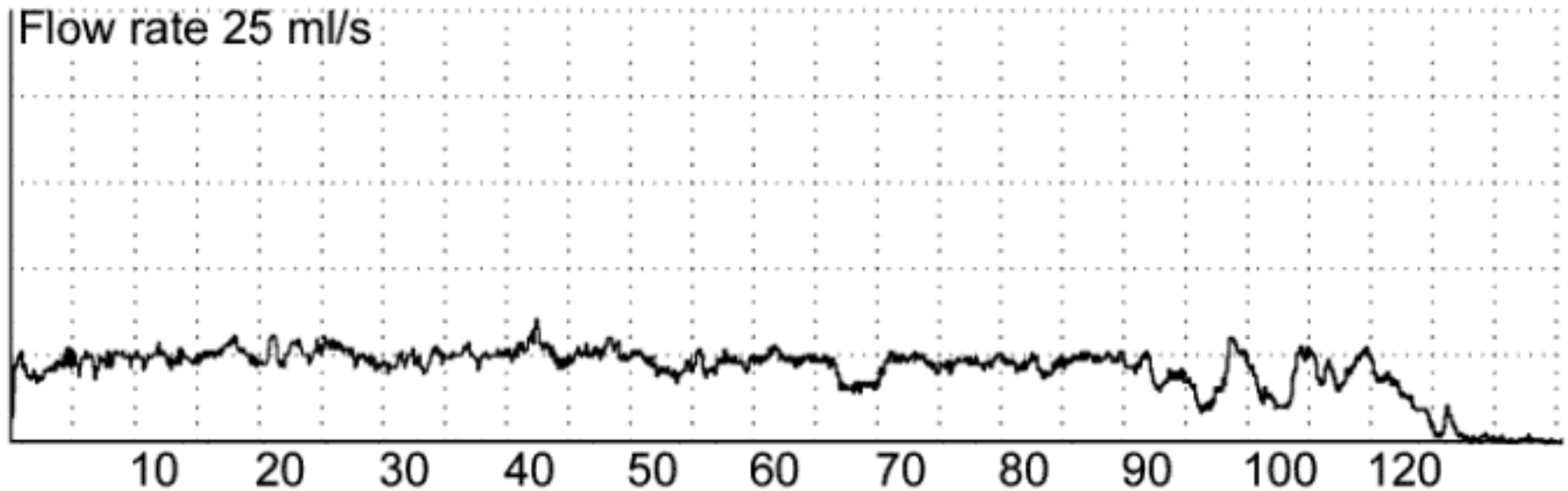
TQ 6.2s

$Q_{\max}$ 7.0 ml/s

Q_{ave} 2.7 ml/s

V_{comp} 133.0 ml

Uroflowmetry: Urethral stricture



50-year-old man

plateau-like flow
pattern

$Q_{\max}$ and Q_{ave} are equal

Prolonged voiding
time

Voiding time

Flow time

Time to max. flow

Max. flow rate

Average flow rate

Voided volume

T_{100} 117.0 s

TQ 115.0 s

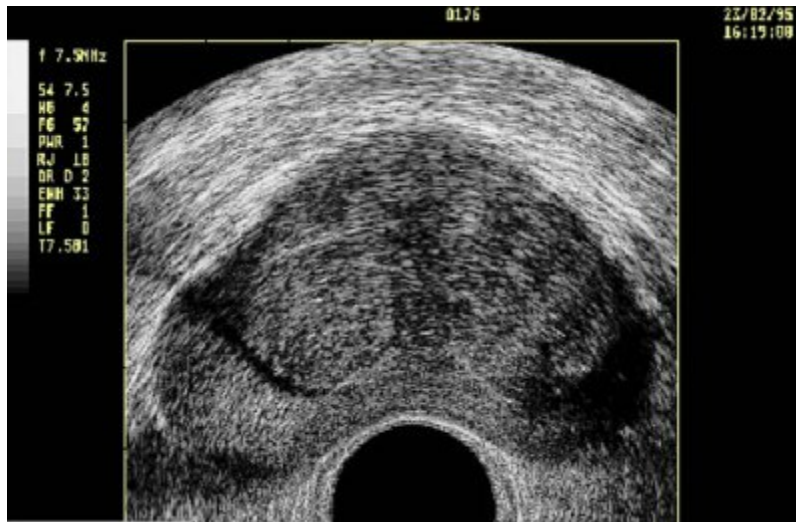
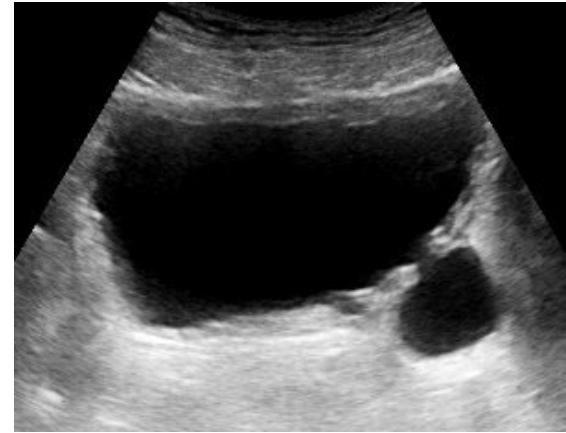
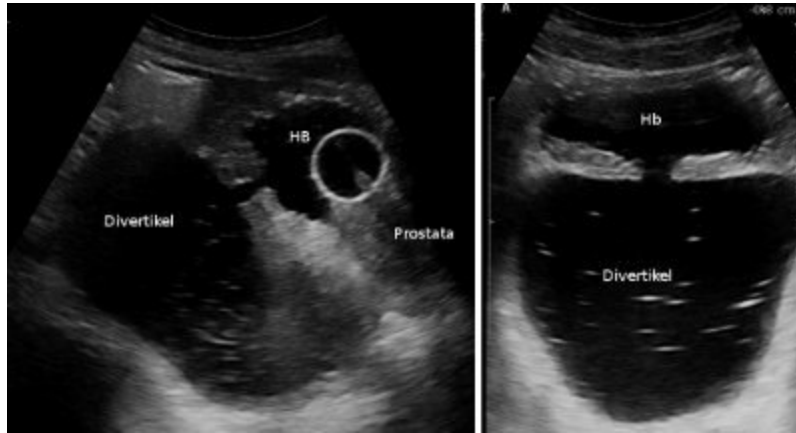
$TQ_{\max}$ 0.5 s

$Q_{\max}$ 5.5 ml/s

Q_{ave} 4.9 ml/s

V_{comp} 567 ml

Sonography findings



Treatment of BPS

Conservative/pharmacological:

(Herbal remedies)

Alpha blockers as Tamsulosin and Afluzosin

5-alpha reductase inhibitors as Finasterid and Dutasterid

PDE-5 inhibitors as Tadalafil 5 mg daily

Anticholinergics as Trospiumchlorid and Oxybutinin

I. Conservative/medication-based:

Herbal remedies: (e.g., pumpkin seeds, stinging nettle, saw palmetto) Presumed anti-inflammatory and anti-edematous effects; mechanism unclear; limited research evidence; inconsistent dosing

Alpha-1 receptor blockers: (e.g., alfuzosin or tamsulosin) Selective alpha blockade at the bladder outlet, thereby reducing muscle tone in the bladder neck and prostate

5-alpha-reductase inhibitors : (finasteride/dutasteride) Inhibit the intracellular conversion of testosterone to active dihydrotestosterone, thereby reducing prostate size and lowering PSA levels

Absolute indication for surgical therapy

Bladder stone

Recurrent urinary infection

Recurrent haematuria

Dilatation of urinary upper tract

Recurrent Urinary retention

Treatment of BPS

Surgical procedure

TUR P (transurethral resection of prostate)

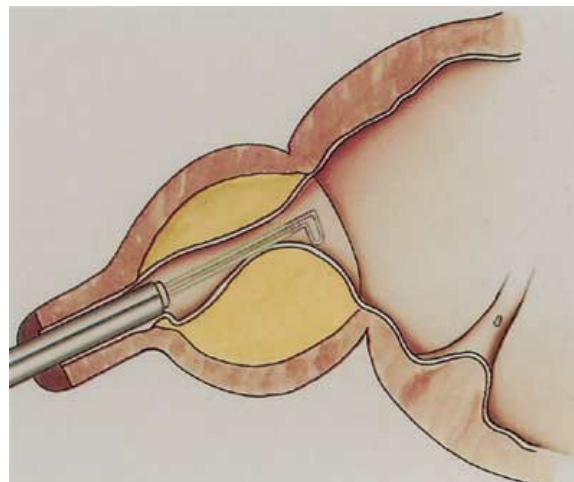
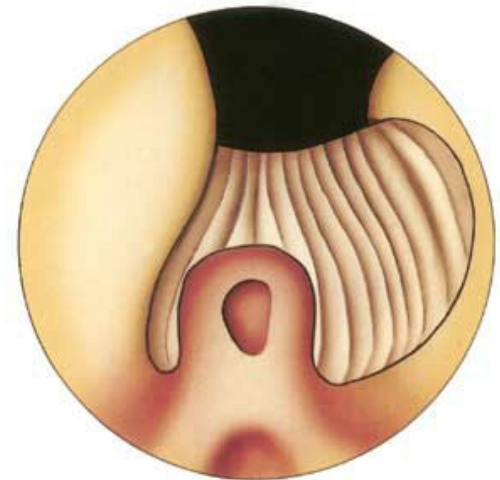
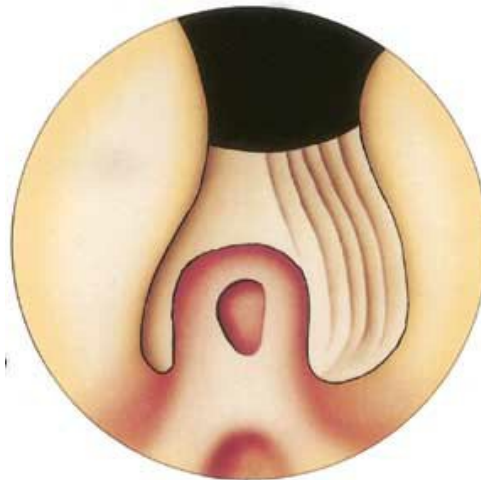
open adenoma enucleation

laser procedure

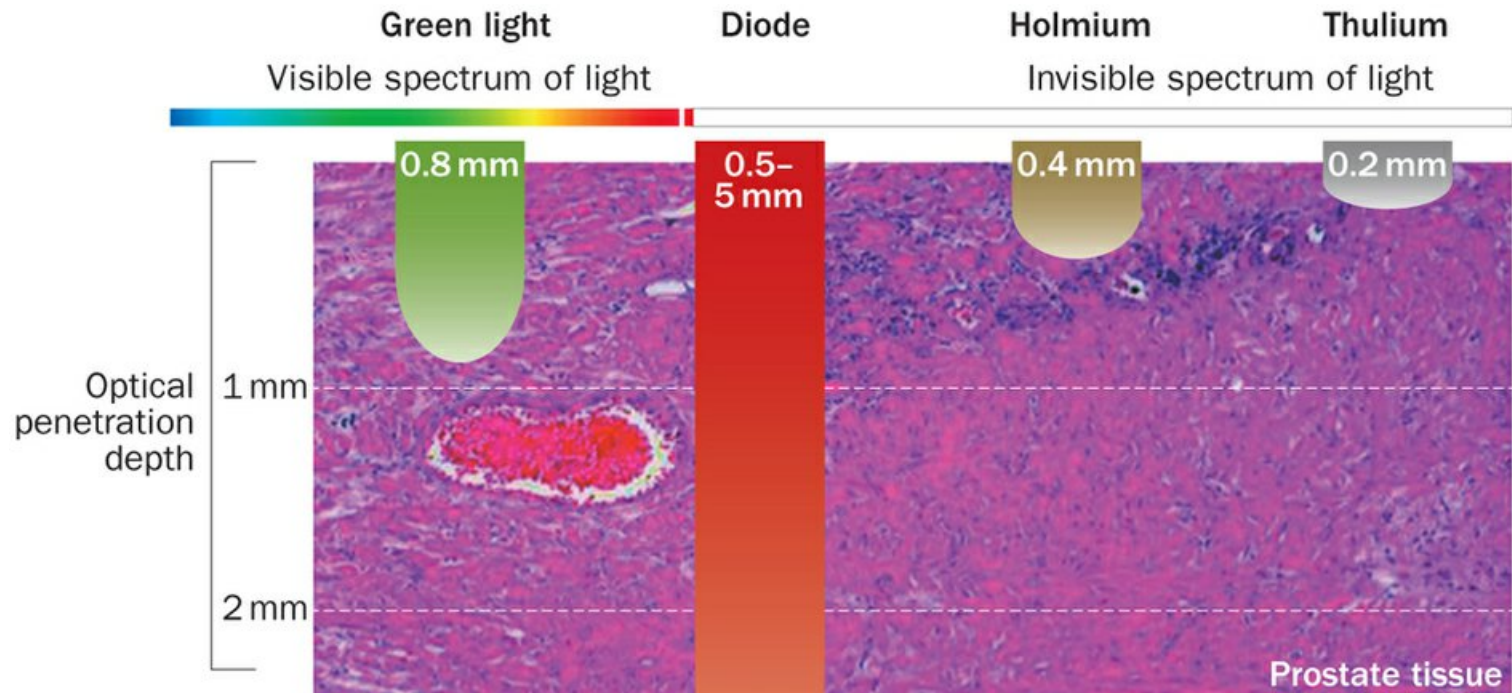
laser enucleation

laser vaporization

TUR-P: Technology monopolar or bipolar

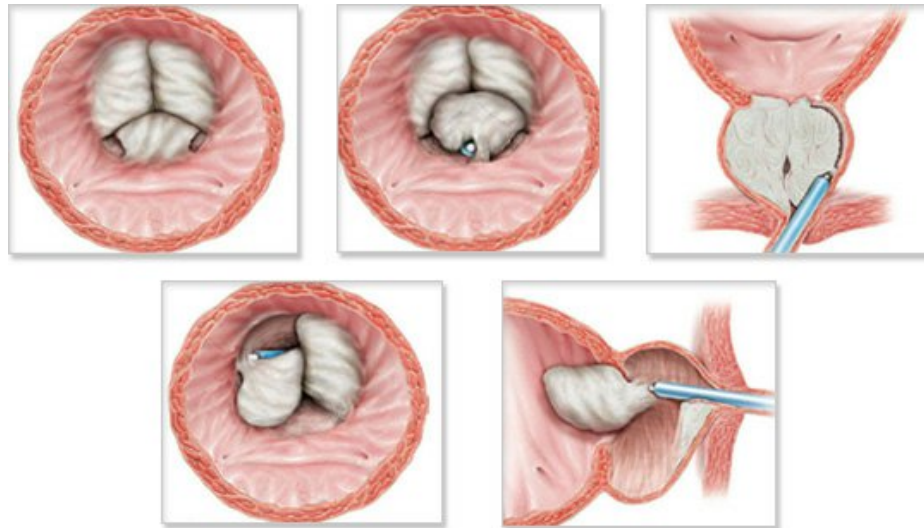


Laser process



Laser process

Thulium- or Holmium-Laser
enucleation (ThuLEP or HoLEP):
Technology



NEW KIDS ON THE BLOCK



TURP



EEP



**offene/lap.
p./ robot.
AE**



Urolift



iTIND



Rezum



Aquablation



PAE

Rezūm Wasserdampf- Therapie



Rectangular Snip

Rezūm

Boston
Scientific



Open adenoma excision

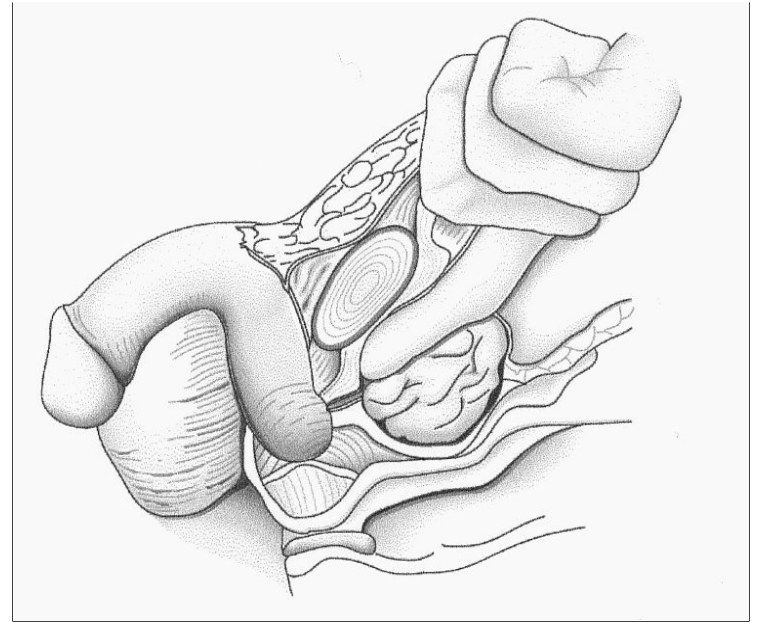
For very large prostate volumes
(> 80 ml)

Median lower abdominal
laparotomy or Pfannenstiel
incision

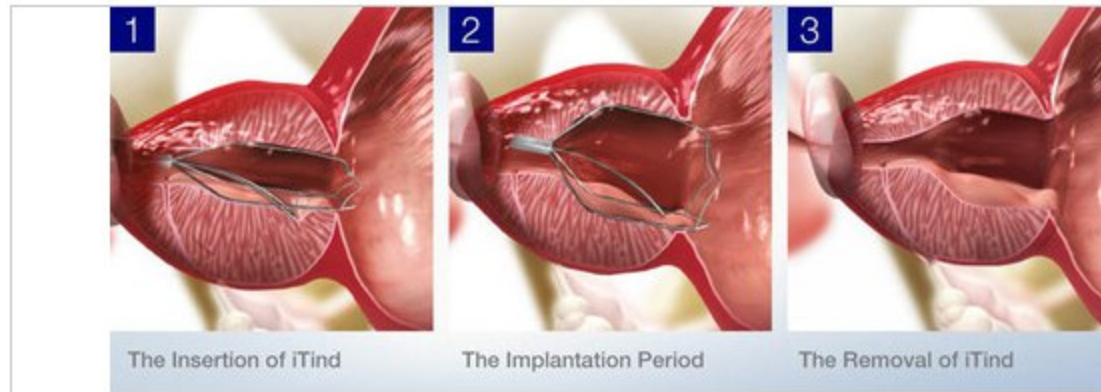
The obstructing portion of the
prostate is removed after
opening the bladder

Postoperative drainage for 1
week; cystogram prior to
catheter removal

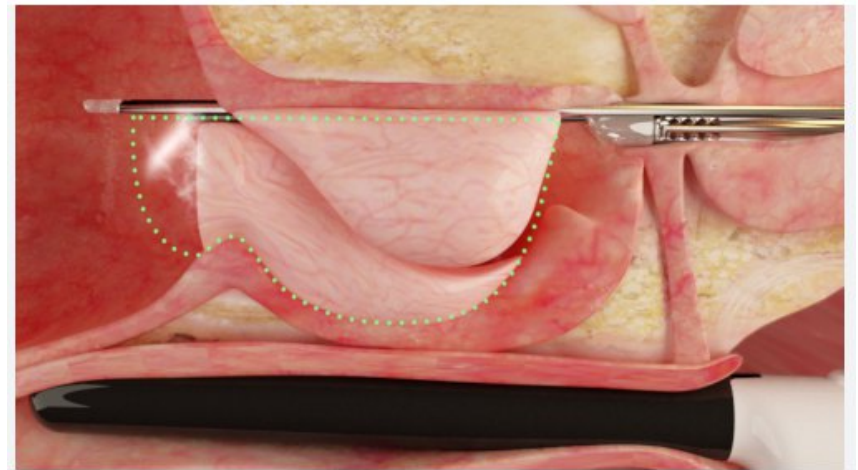
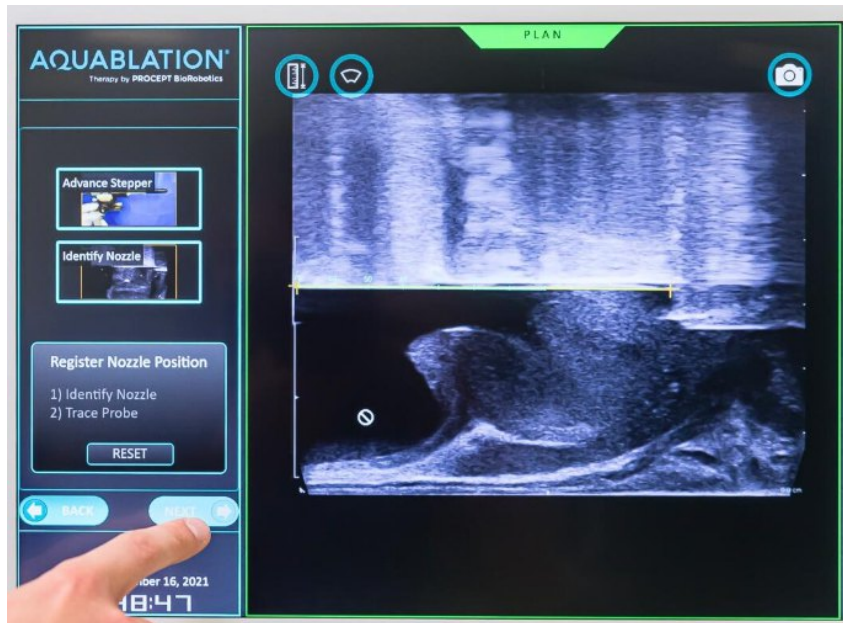
Increasingly being replaced by
ThuLEP



Itend- prostate stent

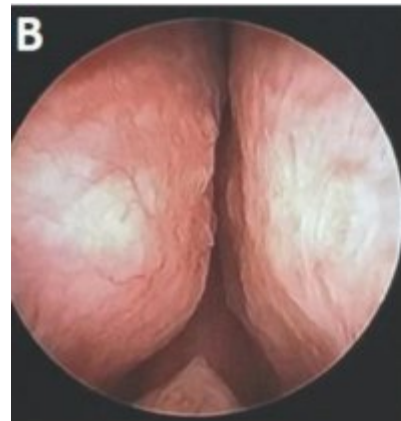
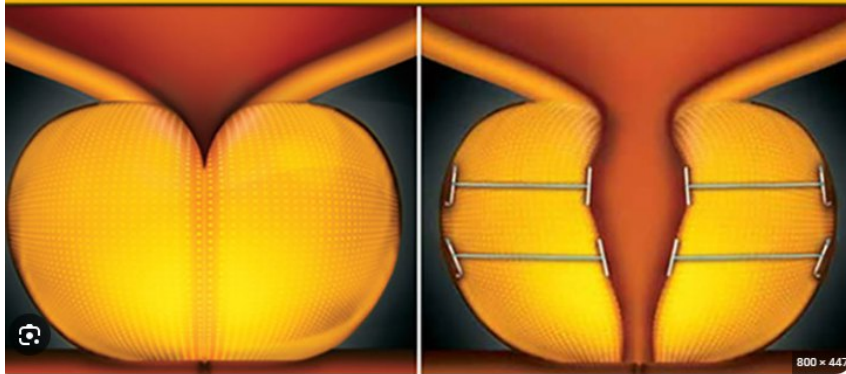


Aquabeam- Aquaablation robotic-assisted

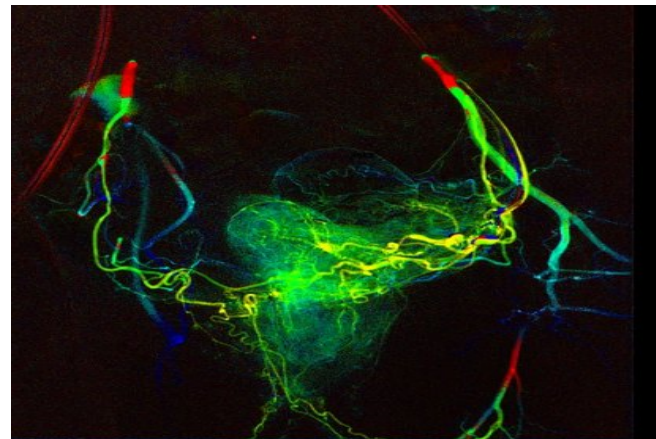
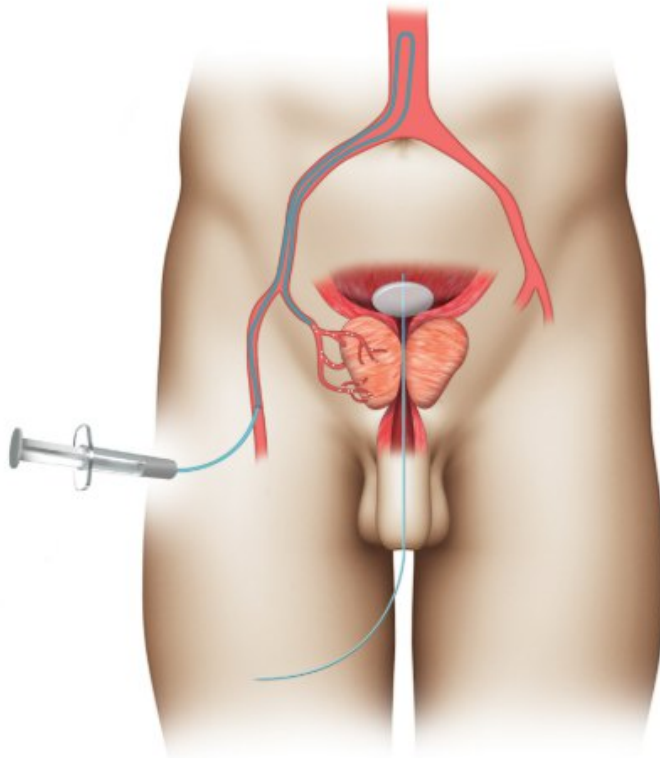


UROLIFT
BPH Relief, In Sight.

Before and After



Prostate arteria embolisation



Conclusions surgical procedure

TUR P (monopolar, monopolar):

Gold standard: (prostate volume) 30-70 ml.

ThuLEP od HoLEP: > 60 ml

PAE: > 90 ml

Rezum: 30-80 ml

Itend: about 50 ml

Aquabeam: unlimited

Prostate adeneomectomy: > 100 ml

Benign Prostatic Hyperplasia

(BPH)

