Transurethral resection of the prostate (TURP)

Transurethral resection of the prostate (TURP) is a surgical technique that involves removing the prostate via an endoscopic method. This surgery marked the inaugural instance of a significant, less intrusive surgical procedure in the contemporary age.

This treatment has been utilized for numerous years and continues to be regarded as the surgical benchmark for bladder outlet obstruction (BOO), with only a few minor modifications since its initial implementation in 1943. A transurethral Resection of the Prostate (TURP) procedure can be employed to expose prostatic abscesses and to access the ejaculatory ducts in certain instances of obstructive azoospermia.

The prostate is a male reproductive organ involved in the process of fertility. The prostate gland contributes prostatic secretions to the ejaculate, consisting of an alkaline solution and prostate-specific antigen, which causes the ejaculate to become more liquid. The prostatic secretions constitute roughly 30% of the ejaculate fluid. The prostate gland originates from the urogenital sinus and is activated by androgens.

The mean size of the prostate is roughly 33 grams. The structure consists of a protective capsule that encloses the functional tissue, which is divided into three regions: central, peripheral, and transitional. The prostatic parenchyma consists of stroma, ducts, and acini.

Obstructive enlargement in benign prostatic hyperplasia (BPH) usually takes place in the transition zone. Fortunately, the transition zone can be readily excised via a transurethral resection of the prostate (TURP). Prostate cancer frequently occurs in the peripheral zone.

The prostate undergoes enlargement as a result of exposure to testosterone, and this growth persists as one ages. Benign prostatic hyperplasia (BPH) is the term used to describe the development of the prostate gland due to a rise in the total number of stromal and epithelial cells, resulting in nodular growth.

Prostatic hypertrophy is the swelling of specific cells in the prostate. If benign prostatic hyperplasia (BPH) leads to urinary blockage and results in either subjective or objective urine problems, it may suggest the necessity of a transurethral resection of the prostate (TURP).

Roughly 70% of males in their sixties and approximately 80% of males aged 70 or above experience varying degrees of benign prostatic hyperplasia. The symptoms of BPH also differ depending on age, with 80% of men aged 80 or above experiencing symptomatic BPH.

The internal iliac artery is the main source of blood flow to the prostate. The inferior vesical artery, a branch of the internal iliac artery, is the third branch. Its terminal branch is the prostatic artery.
The prostatic artery measures approximately 1 cm in length before dividing into two branches: the capsular branch, which surrounds the capsule and has perforating branches, and the urethral branch, which enters the prostate at the 5 o'clock and 7 o'clock positions.
The urethral branch supplies the median lobe, while another branch continues distally to provide blood supply to the periurethral tissue. Additionally, there might be arterial branches originating

from the middle hemorrhoidal and/or pudendal arteries in close proximity to the prostatic apex.

The verumontanum, also known as the "very," is the most crucial anatomical reference point during TURP surgery as it corresponds to the ejaculatory ducts. The structure is situated towards the back at the 6 o'clock position and is approximately 1 cm closer to the external sphincter.
The veru is typically the furthest point of resection, unless performed by very trained surgeons, due to its close closeness to the external sphincter muscle.

The preservation of the external sphincter muscle is crucial for maintaining continence after surgery, as the internal sphincter is removed during a TURP treatment.
The external sphincter is inclined with the anterior edge (at 12 o'clock) tilting towards the patient's body. When excising the upper part of the prostate, it is crucial to exercise caution and avoid removing tissue beyond the very end, which is directly opposite.

Resecting the roof can be tricky since the veru is not visible. Furthermore, the prostatic tissue in this area is rather thin, and there is a notable venous complex known as the periprostatic venous plexus or Santorini's plexus, which covers the front part of the prostatic capsule. If this complex is disrupted, it can lead to severe bleeding that can be quite problematic.

Indications

The indications for a transurethral resection of the prostate (TURP) procedure include the inability of medical treatment to manage lower urinary tract symptoms (LUTS) or bladder outlet obstruction (BOO), obstructive nephropathy, repeated formation of bladder stones, two or more instances of urinary retention, prostate abscesses, difficulties with clean intermittent catheterization, recurrent episodes of visible blood in the urine, incomplete emptying of the bladder, and obstructive azoospermia.

A bladder diverticulum alone is not regarded a sufficient indication.

Typically, males with benign prostatic hyperplasia (BPH) consult medical professionals when they encounter troublesome lower urinary tract symptoms (LUTS). Patients who have lower urinary tract symptoms (LUTS) are typically first treated with medicinal interventions, such as alpha-adrenergic blockers and/or 5 alpha-reductase inhibitors.

If medical care is unsuccessful, they can next choose for a Transurethral Resection of the Prostate (TURP).

Discovering a bladder stone in a patient suggests that the patient is unable to fully empty their bladder, and could potentially benefit from medical therapy for benign prostatic hyperplasia (BPH) or a transurethral resection of the prostate (TURP) to alleviate the blockage. Typically, medical therapy is the preferred choice at the beginning. Renal failure resulting from obstructive uropathy accompanied with bilateral hydronephrosis, along with clear signs of irreversible bladder injury, and the presence of persistent or recurring episodes of acute retention, are additional criteria that warrant the need for TURP surgery.

The prostate's size alone is not deemed a sufficient criterion for surgery. A determination of actual or prospective long-lasting damage to the kidneys or bladder is typically required.
Subjective or objective proof of troublesome symptoms that are not effectively managed by other

methods would also be considered a surgical indication.

A potential indication would be a large intravesical median lobe, particularly if it is causing a ball-valve effect that is unlikely to be resolved by medications or other surgical methods.
Transurethral resection is highly effective in removing such obstructions that do not respond to medical treatment.

A prostatic abscess that necessitates drainage, and is located close to the surface and conveniently reachable through the urethra, can be effectively treated by unroofing it with a transurethral resection of the prostate (TURP).
Challenges encountered during catheterization in a patient experiencing ongoing retention or incomplete emptying can serve as reasons to consider a Transurethral Resection of the Prostate (TURP), as it may alleviate the difficulty associated with catheter insertion. If a patient is diagnosed with obstructive azoospermia specifically at the level of the ejaculatory ducts, a transurethral resection can be performed to remove the obstruction.

To reduce postoperative problems, surgeons should refrain from doing a Transurethral Resection of the Prostate (TURP) on prostates that exceed a size that can be feasibly resected within a 90-minute operating period.

Typically, most resectionists can handle prostates weighing around 75 to 80 grams. However, highly trained and experienced surgeons are capable of managing prostates ranging from 100 to 150 grams in size. Prostates of considerable size that necessitate surgical intervention and are considered unsuitable for transurethral resection of the prostate (TURP) can typically be effectively treated with either open prostatectomy or laser enucleation (HoLEP).

Contraindications

An absolute contraindication refers to a patient who is unable to withstand the anesthetic or potential complications of the procedure due to medical reasons.
An untreated urinary tract infection would also be a definite reason to avoid something.

Post-radiation therapy for prostate cancer, myasthenia gravis, multiple sclerosis, and Parkinson's are considered relative contraindications for this procedure.
These patient groups have a high probability of experiencing postoperative incontinence caused by a malfunctioning external sphincter.
Active anticoagulation is a relative contraindication to a traditional TURP. However, a laser TURP can be conducted on patients who are taking anticoagulants, or the administration of blood thinners can be temporarily paused to facilitate the surgery.

If the size of the prostate exceeds 100 grams, it is typically advisable to pursue a simple prostatectomy or HoLEP procedure. This is because most urologists lack the requisite expertise and experience to properly perform a TURP on such a large prostate. A very overactive bladder that is difficult to manage is likewise a relative contraindication.

Equipment

1. Antimicrobial preparation
2. Antibiotics administered before surgery

3. A resectoscope equipped with a minimum of two wire electrode loops.
4. The options for irrigation include normal saline (bipolar), glycine, sorbitol-mannitol, or other suitable solutions such as monopolar irrigation.
5. A foley catheter with a large diameter, often 22 or 24 French, with a balloon size of 30 cc.
6. Equipment for the continuous watering of the bladder, including tubing and connectors.
7. Aseptic lubricant
8. Large foley catheter drainage bag
9. Syringe with a catheter at the tip
10. Catheter guide
11. Bladder evacuator (Ellik or similar)