

# Laser Surgery and Benign Prostatic Hypertrophy

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**Abbreviations:** BPH: Benign Prostatic Hyperplasia; LUTS: Lower Urinary Tract Symptoms; PVP: Photosensitive Prostate Spray

## Editorial

By the mid-1990s, this technology had already been the subject of a certain interest, which probably had not been achieved due to a lack of technological maturity. Recently, a certain revival for the use of the laser in benign hypertrophy of the prostate gland has again been felt by the urological community.

Laser prostate surgery is a non-aggressive operation that treats boring urinary symptoms in relation with the development of prostate benign hypertrophy, also known as benign prostatic hyperplasia (BPH). The laser will make it possible to remove the more tissues that hinder the free flow of urine.

## What is the Laser?

Laser is an acronym for Light Amplification by Stimulated Emission of Radiation. It is an electric truncated radiation whose spectrum also includes radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, X-rays and gamma rays [1]. All these rays have in common their propagation speed: that of light (186000 miles/s). Their wavelength and energy differentiates them: the shorter the wavelength, the greater the energy.

The lasers used in urology have wavelengths ranging from 400 to 10,000nm and are mainly used for the treatment of prostate diseases and the destruction of stones. Their mode of action is the vaporization of tissues that do not come from machines producing high energy radiation. This principle is used in different ways to create several types of surgical actions: volatilizing tissues, incising them, resequencing prostate swarf, enucleating a prostate lobe, etc. Regardless of the technique applied, the unique result sought is the dis obstruction of the prostate urethra.

## Benign Hypertrophy of the Prostate Gland

BPH - the benign prostate hypertrophy - is an anatomic phenome corresponding to a histological.

## Definition

The proliferation of stroma and epithelial cells that originates in the transition zone of the prostate. The process is age- corrected and requires the addition of master hormones: androgens.

The clinical sympto-matology produced by BPH is related to obstruction of urinary discharge and in particular obstruction of the bladder neck, in relation to the development of prostate volume which compresses the prostate urethra. When she has a clinical translation, symptomatology in association with BPH results in a genes to urinate, the symptomes of which are grouped together under the term L. U. T. S: Lower Urinary Tract Symptoms.

## A distinction is made between

**An irritative symptomatology:** Abnormal frequency of nocturnal or diurnal urination, urgency of urination and an inoperable need.

**Obstructive symptomatology:** Weakening of the urine stream, need to push (dysuria), delayed droplets, waiting for the initiation of the jet; incomplete emptying of the bladder after urination whereas physio-logically the emptying of the bladder is complete after normal urination.

Although these symptomas are not specific to the diagnosis of HPB, they are frequently found in the elderly man who presents an increase in volume of the gland associated with alteration of the bladder muscle in relation to this process. HBP is present in more than half of the men over 50 years of age and up to 75% of those over 80 years of age.

## Treatments

### Medicines

Herbal extracts, alpha-blockers, hormonal treatments.



## The transurethral resection of the prostate (RTUP)

An endoscopic procedure, using electric current to cut the BPH into chips which are then extracted through the urethral canal.

## Transvesical adenomectomy

An open surgery that allows the prostate lobes to be enucleated and extracted through a horizontal or vertical incision in the lower part of the abdomen [2].

## Laser Surgery

It has several advantages well established over other more conventional surgical treatments, including but not limited to:

### Reduced risk of bleeding

It is a very interesting option in elderly and fragile patients, especially those with anticoagulant or antiplatelet anticoagulant treatment or in patients with bleeding disorders.

### Reduction

A significant reduction in the duration of the hospital stay. It can usually be done with a single night of post-operative hospitalization.

### Rapid recovery

The resumption of personal and professional activities is generally acquired after a convalescence from 7 days to 2 weeks.

The duration of a survey is shorter. In most cases, this surgery requires less than 24 hours of handheld venous catheter surgery. Improvements in the patient's urinary conditions those are more readily noticeable.

## Techniques and Modes of Action

The treatments are carried out by endoscopy, introducing the instruments and the laser through the urethral canal, thus without any cutaneous incision. There are several types of surgical lasers and different types of surgeries. All lasers use the energy of a narrow beam of light coarsely cored monochromatic light to vaporize prostate tissue by absorbing the water they contain.

There are two main modes of action:

- i. Vaporization by laser that volatilizes the tissues responsible for obstruction to increase the size of the urethral canal in the portion where it passes through the prostate.
- ii. Laser ablation of these tissues.

In practice, there are several types of disponibile laser devices to perform three main types of surgery:

- o Photosensitive Prostate Spray (PVP) or KTP laser vaporization. The AMS Greenlight laser, which emits green-coloured radiation, acts on the prostate tissue. It vaporizes them because of the very important heat it releases. It is suitable for use with low-level BPH due to the time required

for treatment. The more powerful last-generation devices are more powerful and allow treatment of larger prostates, but at the cost of a greater post-operative irritative symptomatology.

- o Lumenis Holmium lasers or the Thullium laser as the Revolix of Lisa Laser [3]. Here, the energy is highly absorbed by the water, which makes its action very precise and prevents the penetration of energy deep into the tissues.

The vaporesentation cuts the BPH into fine tissue shavings which are then washed out by washing through the urethral canal through the metal sheath of the endoscopic sector. This technique is well suited for small to medium volume prostates that may be responsible for an intense urinary genesis. These lasers are also used to treat bladder or kidney tumours. The enucleation is an endoscopic surgical procedure that performs a complete removal of BPH, such as prostatectomy or open air adenomectomy. It is complete and removes all the prostate tissue that makes urination difficult. It is best suited to the treatment of voluminous prostates. The Holmium and Thullium lasers are suitable for this purpose.

Prostate lobes are enucleated in turn in the bladder. Radiation allows them to cleave from the prostate gland in the capsule plane. Then, a morcellator separates the tissue into fine shavings that can be easily sucked up by the sheath of the sector to allow their elimination via the urethral duct. This operation, which is more technically difficult, is suitable for the treatment of all prostates regardless of their volume. It requires a special learning curve but has a number of advantages:

- i. Very large quantities of prostate tissue are limited and can be subjected to anatomo-pathological examination for possible prostate cancer.
- ii. The process is usually final and unlikely to cause injury. All of the BPH tissue has been removed and rarely grows back.

With laser enucleation, the surgeon reduces the volume of the prostate gland, but there remains a thin tissue shell, which must be monitored to prevent the subsequent development of prostate cancer, which is always possible and independent of treatment of the BPH.

## Conclusion

Nearly 20 years after its introduction in urology, laser technology has acquired sufficient maturity to be used routinely as a surgical treatment for prostate cancer.

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