Recent Interventional Management in Treatment of BPH

An Essay

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بسم الله الرحمن الرحيم

وقُلِ اعْمَلُوا فَسَيَرَى اللَّهُ عَمَلَكُمْ
ورَسُولُهُ والْمُؤْمِنُونَ

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LIST OF ABBREVIATIONS

Abbrev.	Full term
AUA	American urological association
AVP	Arginine vasopressin
BFGF	Basic fibroblastic growth factor
BOO	Bladder outlet obstruction
BPH	Benign prostatic hyperplasia
CW	Continuous wave
CLAP	Contact laser ablation of the prostate
DRE	Digital rectal examination
DHT	Dihydrotestosterone
EAU	Europian Associasion of Urology
Hb	Haemoglobin
HIFU	High intensity focused ultrasound
Ho:YAG	Holmium:Yttrium-Aluminum-Garnet
HoLEP	Holmium laser enucleation of the prostate
HoLAP	Holmium laser ablation of the prostate
HoLRP	Holmium laser resection of the prostate
HPS	High performance system
IHD	Ischemic heart disease
ILC	Interstitial laser coagulation
IPSS	International prostate symptom score
KTP	Potassium titanyl phosphate
KGF	keratinocyte growth factor
LBO	Lithium triborate
LUTS	Lower urinary tract symptoms
MIT	Minimally invasive treatment
Nd:YAG	Neodymium: Yttrium-Aluminum-Garnet
NO	Nitric oxide
OAB	Over active bladder
PDE	Phosphodiesterase
PKEP	Plasma kinetic enucleation of the prostate
PKVP	Plasma kinetic vaporesection of the prostate
PSA	Prostatic specific antigen

LIST OF ABBREVIATIONS (Cont...)

Abbrev.	Full term
PVP	Photoselective vaporization of the prostate
PVRU	Post voiding residual urine
Q_{av}	Average flow rate
Q_{max}	Maximum flow rate
QOL	Quality of life
RF	Radiofrequency
RCT	Randomized control study
SD	Standard deviation
SPSS	Statistical package for social science
TEAP	Transurethral Ethanol ablation of the prostate
TGF-β	transforming growth factors
TRUS	Transrectal ultrasound
TUIP	Transurethral incision of the prostate
TUMT	Transurethral microwave therapy
TUNA	Transurethral needle ablation
TUR syndrome	Transurethral resection syndrome
TURis	Transurethral resection in saline
TURP	Transurethral resection of the prostate
TUVP	Transurethral vaporization of the prostate
TUVRP	Transurethral vaporization resection of the prostate
UTI	Urinary tract infection
VEGF	Vascular endothelial growth factor
VLAP	Visual laser ablation of the prostate
V_{vol}	Voided volume
WIT	Water induced thermotherapy
WW	Watchful waiting

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Introduction

Benign prostatic hyperplasia (BPH), is one of the most common problems of aging men, it can be associated with bothersome lower urinary tract symptoms (LUTS) that affect quality of life by interfering with normal daily activities and sleep patterns.

Lower urinary tract symptoms whether irritative ; urinary frequency, urgency, nocturia or obstructive; weak stream, and incomplete bladder emptying - comprise a major health concern for many older men.

Benign prostatic hyperplasia (BPH) is a histologic diagnosis that refers to the proliferation of smooth muscle and epithelial cells within the prostatic transition zone ***(Schroeck et al., 2012)***. Enlargement of the prostatic gland from hyperplasia can cause bladder outlet obstruction (BOO) and be a major cause of lower urinary tract symptoms (LUTS) in older men. (BPH) is a chronic and often progressive condition affecting the majority of men by the seventh decade of life ***(Lee et al., 2012)***.

Additionally, up to 40% often present BPH is commonly and, probably incorrectly, referred to as prostatism. Histo-pathologically, BPH is characterized by an increased number of epithelial and stromal cells in the periurethral area of the prostate.

The observation of new epithelial gland formation is normally seen only in fetal development and gives rise to the concept of embryonic reawakening of the stroma cells inductive potential ***(Cunha et al., 1983)***. The precise molecular etiology of this hyperplastic process is uncertain. The observed increase in cell numbers may be the result of epithelial and stromal proliferation or of impaired programmed cell death leading to cellular accumulation. Androgens, estrogens, stromal-epithelial interactions, growth factors, and neurotransmitters may play a role, either singly or in combination, in the etiology of the hyperplastic process.

Transurethral resection of prostate (TURP) and simple open prostatectomy (OP) for the larger prostate is currently the gold standard surgical therapies in the treatment of benign prostatic hyperplasia (BPH). Although these techniques have demonstrated long-term durable results, they are not without complications, which include bleeding, fluid absorption, and associated transurethral resection (TUR) syndrome, prolonged catheterization, urethral stricture, and bladder neck contracture ***(Netsch et al., 2012)***. In addition, patients undergoing treatment for (BPH) are progressively older and have more comorbidity.

The number of such procedures performed has significantly decreased in the last three decades. A major factor in this decline has been the shift to a medical management treatment strategy for (BPH) ***(Schroeck et al., 2012)***, and the advent of well tolerated and effective minimally invasive treatments ***(Netsch et al., 2012)***. Additionally, (BPH) treatment has focused on the alteration of disease progression and prevention of associated complications ***(Bach et al., 2010)***. Treatment guidelines now recommend the urologist and patient consider minimally invasive therapies such as:

1- Prostatic stents. Two essentially similar types of permanent intraurethral stents "The titanium stent- The cobalt-chromium stent "are available that differ in material and delivery system. Stents are not indicated in the treatment of median lobe enlargement. Stents are useful for high-risk patients because they can be placed under topical urethral lidocaine with IV sedation, local prostatic block, or light general anesthesia.

2- Balloon dilation of the prostate. The use of high-pressure balloons to dilate the prostate generated some enthusiasm when the technique was initially introduced in 1990; however, long-term results have been disappointing. Improvement in subjective symptoms predominates over objective voiding parameters. However, this is a minimally invasive procedure that can be performed under light anesthesia, even in high-risk patients. It has been to some extent supplanted since the development of urethral stents.

3- Transurethral microwave thermotherapy (TUMT) alongside surgical intervention and medical management.

High-energy (TUMT) has emerged as an attractive alternative to standard prostatectomy as well as medical therapy for (BPH). The need for general anesthesia has steadily decreased and many of the treatments are now performed on an outpatient basis.

4- Transurethral needle ablation (TUNA) involves the transurethral application of radiofrequency energy at 490 kHz to the prostate lobes. This produces small areas of thermal injury that eventually produce changes in subjective symptoms, although the mechanism is unclear. There is no significant shrinkage of the prostate. About one-third of patients experience short-term urinary retention after TUNA. Symptomatic improvement is much more prominent than objective improvement, and long-term durability of the response is unclear. However, the procedure is well tolerated and can be performed under conscious sedation.

5- High-intensity focused ultrasound (HIFU). US energy can be focused with a parabolic reflector and is capable of producing significant thermal tissue injury. Current equipment consists of a rectal probe (Fig. 6-8B) that can image the prostate as well as emit HIFU. Because the patient must remain still during the treatment, general anesthesia is often required. Clinical efficacy is moderate, with flow increasing to an average of 13 mL/s at 1 year, but symptomatic improvement is significant. Most patients require some period of postoperative catheterization.

6- The need for even more minimally invasive surgical techniques is constantly growing to treat every prostate size ***(Cunha et al., 1983 and Netsch et al., 2012)***. In recent years, various laser techniques have been developed to overcome the complication of (TURP) and (OP) while striving to achieve comparable function results.

During the past decade, the development of laser therapy has been dramatic and growth of clinical experience has produced more refined techniques and devices that challenge (TURP) [6.7]. The four groups of laser systems that are currently used for (BPH) include the following:

- Kalium titanyl phosphate [KTP]: (Nd:YAG) and lithium borat ([LBO]:Nd:YAG) lasers.
- Diode Lasers.

- Holmium: yttrium-aluminum-garnet (YAG) lasers
- Thulium: YAG lasers.

All use 0.9% saline as the irrigant. The marketing term "Green Light" should not be used, as both (KTP) and (PVP) emit green light, and several manufacturers make these devices.

Laser use has evolved for a range of disease faced by urologist. Many centers around the globe now rely on the advantages offered by lasers compared for older technologies, for both endoscopic stone surgery and endoscopic surgery for symptomatic benign prostate hyperplasia (BPH). The most important factors differentiating laser-based procedures are: wavelength, fiber type, and surgical technique.

A number of lasers are in current clinical use, each with distinct properties, hence the debate amongst clinicians concerning "the best laser for the job". The urologist must be aware of the differences, advantages and disadvantages of commercially available lasers in order to maximize surgical efficacy and minimize morbidity.

Aim of the work

The essay is a trial to spot the updated information and researches found in the literature as regards the recent surgical intervention in (BPH) management, understand the mechanism of action, efficacy, possible adverse effects and their urologic applications.