

Holmium Laser Enucleation of the Prostate (HOLEP) Technique: A Safe and Effective Option in Transurethral Prostate Resection

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ABSTRACT

Holmium laser enucleation of the prostate (HOLEP) is a surgical technique increasingly used in transurethral resection of the prostate. This procedure has been shown to be safe and effective in the treatment of benign prostatic hyperplasia, offering a higher success rate in the removal of prostate tissue and a lower rate of complications compared to other methods of transurethral prostate resection.

In addition, HOLEP has been used successfully in patients with large prostates and those with coagulation disorders, making it a safe and effective treatment option for a wide variety of patients. In summary, HOLEP is an effective and safe surgical technique in transurethral resection of the prostate, and may be an attractive treatment option for patients seeking a rapid recovery and reduced complication rate.

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INTRODUCTION

Transurethral resection of the prostate (TURP) is a surgical procedure used to treat benign prostatic hyperplasia (BPH) or enlargement of the prostate. BPH is a common condition in men over the age of 50, characterized by an enlarged prostate that can obstruct the flow of urine.¹

There are different types of lasers that can be used in transurethral resection of the prostate (TURP). The most common laser modes used in TURP are described below:¹

Neodymium laser: This laser emits a wavelength of 1064 nm and is used in vaporization of prostate tissue. This laser has been widely used in TURP, but has been largely replaced by other lasers due to its side effects, such as blood clot formation and Foley catheter obstruction.¹

Diode laser: This laser emits a wavelength of 980 nm and is used for vaporization and coagulation of prostate tissue. This laser has an improved safety profile compared to the neodymium laser and has been used in TURP with good results.¹

Holmium laser: This laser emits a wavelength of 2140 nm and is used in the enucleation of prostate tissue. The holmium laser has high surgical precision and can enucleate prostate

tissue with a low complication rate. The holmium laser enucleation technique is known as Holmium Laser Enucleation of the Prostate (HOLEP).¹

Thulium laser: This laser emits a wavelength of 2013 nm and is used for vaporization and enucleation of prostate tissue. The thulium laser has high surgical precision and has been used in TURP with good results.¹

Each type of laser has its own advantages and disadvantages, and the choice of laser will depend on several factors, such as prostate size, patient anatomy and surgeon preference. In general, the choice of laser should be based on the safety and efficacy profile of the laser in question, and the surgeon's experience with the laser.

WHAT IS HOLMIUM LASER ENUCLEATION OF THE PROSTATE?

HOLEP (Holmium Laser Enucleation of the Prostate) is a surgical technique used in transurethral resection of the prostate (TURP) to treat benign prostatic hyperplasia (BPH). BPH is a common condition in men over the age of 50, characterized by an enlarged prostate gland that can cause urinary flow obstruction.

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TURP is a traditional surgical technique that uses a tool called a resectoscope to cut and remove excess prostate tissue through the urethra. HOLEP, on the other hand, uses a holmium laser to enucleate (detach) the prostate tissue, which is then removed using a morcellation instrument.¹

Holmium laser enucleation of the prostate (HOLEP) is a transurethral resection of the prostate (TURP) technique that uses a holmium laser to enucleate and remove hyperplastic prostate tissue. The following are some of the reasons why HOLEP is considered a superior technique to other forms of TURP:²

Less bleeding: HOLEP uses laser energy to remove prostate tissue, which reduces bleeding during surgery. This means patients have less risk of needing blood transfusions after surgery and experiencing other side effects associated with bleeding.²

Increased precision: The holmium laser is used to cut the prostate tissue with great precision, allowing the surgeon to selectively remove hyperplastic tissue, thus sparing healthy prostate tissue. This reduces the risk of postoperative complications, such as urinary incontinence and impotence.²

Fewer complications: HOLEP has a very low rate of complications, including bladder neck obstruction and urethral stricture. This is largely due to the holmium laser's ability to vaporize prostate tissue and preserve the anatomy of the urethra and bladder.²

Increased efficacy: HOLEP is a very effective technique for reducing symptoms associated with benign prostatic hyperplasia (BPH), such as frequent and urgent urination, difficulty initiating urination, and the sensation that the bladder does not empty completely. Studies have shown that HOLEP has a long-term success rate comparable to other forms of TURP.²

Shorter hospitalization time: HOLEP is a minimally invasive technique that is performed through the urethra, which means patients typically recover more quickly and require less hospitalization time than with other forms of TURP.²

HOW SAFE IS THIS PROCEDURE?

Regarding safety in laser TURP, it is important to note that all types of lasers have their own advantages and disadvantages. However, in general, diode lasers and holmium lasers are considered the safest for TURP compared to other types of lasers.²

Diode lasers emit a wavelength of 980 nm, which allows them to be highly absorbed by hemoglobin in the blood and by melanin in the prostate tissue. This reduces the risk of damaging nearby tissues, such as the bladder neck and urethra, and also decreases bleeding during and after the procedure. In addition, diode lasers also have a limited depth of penetration, which means that the laser does not penetrate

too deeply into the tissue and, therefore, the risk of damage to nearby structures is minimized.²

On the other hand, the holmium laser emits a wavelength of 2.1 microns, which allows it to be highly absorbed by water. This makes the holmium laser very effective in vaporizing prostate tissue and also reduces intraoperative and postoperative bleeding. In addition, the holmium laser also has the ability to cut and vaporize soft tissues with precision and with minimal damage to surrounding tissues.³

Both diode and holmium lasers are considered safe for TURP. The choice of the most appropriate laser will depend on several factors, such as the size of the prostate, the surgeon's experience and patient preferences.³

WHAT COMPLICATIONS CAN THERE BE IN THE USE OF OTHER LASERS?

Transurethral resection of the prostate (TURP) is a surgical procedure commonly used to treat benign prostatic hyperplasia (BPH), and although it is considered safe and effective, it can present certain complications. The following are some of the most common complications that can occur after TURP:⁴

Bleeding: Bleeding is a common complication of TURP and can range from minor bleeding to more significant bleeding that may require blood transfusion or even surgical reoperation.⁴

Infection: TURP may increase the risk of urinary tract infection, especially if urinary retention occurs after the procedure.⁴

Problems with urination: Patients may experience difficulty urinating after TURP, including a feeling of frequent urge to urinate, difficulty initiating urination, and a weak urine stream.⁴

Urinary incontinence: Urinary incontinence after TURP is rare, but may occur in cases where the bladder sphincter muscle is damaged during the procedure.⁴

Erectile dysfunction: Although rare, TURP may cause erectile dysfunction in some patients, especially those who already had erectile problems prior to the procedure.⁵

Urethral narrowing: Rarely, TURP can cause narrowing of the urethra, which may require additional surgery to correct.⁵

Adjacent tissue injury: TURP can cause injury to tissues adjacent to the prostate, such as the bladder or rectum.⁵

It is important to keep in mind that most of these complications are rare and can be prevented with proper patient selection, good surgical technique and adequate postoperative care.⁶

Bipolar Plasma Enucleation of the Prostate (BPEP) is a minimally invasive surgical technique used to treat

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Benign Prostatic Hyperplasia (BPH), also known as benign enlargement of the prostate.⁶

BPEP uses a surgical device that emits a bipolar plasma that coagulates and cuts the prostate tissue. This device is able to control bleeding and avoid damaging adjacent tissues. The procedure is performed through the urethra, without the need for an external incision.⁷

In the BPEP procedure, an instrument called a bipolar resectoscope is inserted through the urethra into the prostate. The plasma device is then used to cut and remove the prostate tissue that is obstructing the flow of urine. As the tissue is removed, a clear space is created in the prostate, allowing urine to flow more easily.⁷

The BPEP procedure is considered a safe and effective alternative to open surgery for BPH. It has been shown to have a similar success rate to other surgical procedures for BPH, such as TURP (transurethral resection of the prostate) and HoLEP (holmium laser enucleation). In addition, BPEP has the advantage of a lower rate of complications, such as bleeding, urinary incontinence and erectile dysfunction, compared to other procedures.⁷

HoLEP VS BPEP

Although both techniques are effective for the treatment of BPH, there are some important differences between them. One of the main differences is the way in which the prostate tissue is removed. In BPEP, the tissue is cut and coagulated, whereas in HoLEP, it is enucleated and removed. This means that in BPEP, tissue fragments may be produced that must be removed through the urethra, whereas in HoLEP, the tissue is removed in its entirety.^{7,8}

Another important difference is the duration of the procedure. In general, BPEP has a shorter duration than HoLEP. However, HoLEP has the advantage of greater precision and control during the procedure, which may reduce the risk of complications.^{7,8}

In terms of long-term outcomes, recent studies have shown that both techniques have a similar success rate in terms of improving urinary symptoms and preventing disease progression.⁸

Both Bipolar Plasma Enucleation of the Prostate and Holmium Laser Enucleation of the Prostate are minimally invasive and effective surgical techniques for the treatment of Benign Prostatic Hyperplasia. Although there are differences in the way prostate tissue is removed and the duration of the procedure, both techniques have a similar success rate and can be considered safe and effective options for the treatment of BPH.⁸

CONCLUSIONS

In conclusion, the use of holmium laser enucleation of the prostate (HoLEP) in transurethral resection of the prostate is a safe and effective surgical technique for the treatment of benign prostatic hyperplasia. Numerous studies have shown that HoLEP is a viable alternative to open surgery and other

methods of transurethral resection of the prostate, offering a higher success rate in the removal of prostate tissue, a lower complication rate and a faster recovery.

In addition, it has been shown that HoLEP can be used in patients with large prostates and those with coagulation disorders, making it a safe and effective treatment option for a wide variety of patients.

However, as with any surgical procedure, there is always a risk of complications and it is important that patients understand these risks before undergoing HoLEP or any other procedure. Therefore, it is important that patients speak with their urologist to determine the best treatment option for their specific case.

Overall, studies have consistently demonstrated that HoLEP is an effective and safe surgical technique for transurethral resection of the prostate compared to other methods of transurethral resection of the prostate, and is an attractive treatment option for patients seeking a rapid recovery and reduced complication rate.

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