

Transurethral Microwave Thermotherapy (TUMT) for Benign Prostatic Hyperplasia; Our Experience.

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ABSTRACT:

BACKGROUND:

Minimally invasive office – based treatments for benign prostatic hyperplasia (BPH) are challenging the traditional surgical and medical management options for symptomatic BPH.

OBJECTIVE:

The aim of this study is to assess the efficacy of transurethral microwave therapy (TUMT) on spontaneous voiding, maximum flow rate and residual urine volume in patients with otherwise poor general health and BPH.

METHODS:

Thirty (30) patients with associated comorbid diseases and retention of urine (acute and chronic) due to BPH were subjected for TUMT as an outpatient procedure, from January 2002 to November 2003. Follow up was performed 10 days post TUMT, and then monthly until 3 months clinically and by assessing, spontaneous voiding, maximal flow rate and residual urine volume.

RESULTS:

Out of 30 treated patients, 5 were able to void spontaneously (without catheter) at the end of 12 weeks following TUMT. There was a little improvement of maximum urinary flow rate and residual urine volume at the end of the same period.

CONCLUSION:

TUMT is an alternative choice for the treatment of patients with BPH and chronic medical illnesses or those refusing surgery. However low energy protocol TUMT is not an effective treatment mode for patients with urinary retention due to BPH.

KEYWORDS: BPH treatment, microwave thermotherapy.

INTRODUCTION:

The therapeutic options for benign prostatic hyperplasia (BPH) can be divided into medicinal, surgical and minimally invasive treatments. The minimally invasive therapeutic options of BPH is gradually accepted by more and more urologists for its advantages of less damage, good effect, quick recovery and easy acceptance by patients, includes transurethral needle ablation of the prostate (TUNA), transurethral microwave therapy (TUMT), photo selective laser vaporization of the prostate (PVP), holmium laser enucleation of the prostate (HoLEP) and so on ⁽¹⁾.

TUMT is designed to be office based, requiring minimal anesthesia and catheterization time. Most TUMT devices include treatment protocols of 30 to 60 minutes. Although each device is different, all rely on the principles of thermoablation. Each device generates a heat field encompassing all or part of the prostate gland. When generated temperatures reach therapeutic levels for adequate

periods of time, coagulative necrosis occurs within the prostate gland. Ablation of the prostatic tissue surrounding the urethra serves to relieve obstruction, increase peak flow rate, and improve symptom scores and quality-of-life indices ⁽²⁾. Initial experience focused on low – energy protocols, but subsequently higher energy levels were used to improve treatment outcomes and response rates. Although high – energy TUMT is associated with increased morbidity ⁽³⁾, techniques such as intraurethral prostate injections with mepivacaine epinephrine are used to optimize the outcome of high – energy TUMT ⁽⁴⁾.

The aim of this study is to assess the efficacy of TUMT on spontaneous voiding, maximum flow rate and residual urine volume in patients with otherwise poor general health and retention due to BPH.

PATIENTS AND METHODS:

Thirty (30) patients were included in the study which was conducted in Al Karama Teaching Hospital from January 2002 to November 2003. They presented with urinary retention (acute or chronic) due to BPH with associated severe medical co – morbidity. There was no reported history of a recent surgical intervention or certain

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drug intake which could precipitate acute urinary retention. Prior to treatment with microwave thermotherapy, patients were clinically evaluated. None of them gave a history of previous TURP, bladder neck incision, or pelvic trauma. Physical examination included digital rectal examination and neurological checking. Baseline estimation of prostate specific antigen (PSA), prostate volume through transrectal ultrasonography, residual urine volume through transabdominal ultrasonography, and uroflowmetry was carried out. Flexible urethrocystoscopy under local anesthesia was performed to exclude urethral stricture and bladder tumors and stones.

Technique. Low – energy protocol of TUMT was carried out using proscare® machine. Patients underwent one session of TUMT for 60 minutes with a temperature of 45 °C. Specially designed five – way catheter was used. The catheter ports were used for inflow and outflow of cooling water, urinary drainage, balloon inflation, and insertion of the antenna with a small port for the connection of the sensor. The procedure were carried out under local anesthesia (Lidocaine gel) and patients received preoperative analgesia (Diclofenac 75mg intramuscular injection). After the TUMT session all patients were catheterized using 16 French Foley's catheter for 10 days and given oral antibiotic (ciprofloxacin 500mg twice daily for 3 days). A trial of decatheterization was attempted 10 days after the TUMT session.

Follow up was evaluated for 12 weeks using the following criteria; the ability to void spontaneously (without catheter), maximum flow rate and residual

urine volume. Treatment failure was defined as inability to regain spontaneous voiding within 12 week period after TUMT session and/or persistent high residual urine volume (> 150ml).

Statistical analysis:

Data were analyzed using mean ± standard deviation (SD), frequency, and percentage.

RESULTS:

Thirty (30) patients aged (46 – 82) years; with a mean age (66.2) years underwent TUMT. No clinical stigmata of neurological illness were detected. Endoscopic evaluation neither showed prostate middle lobe hypertrophy or prominent median bar nor an evidence of bladder tumors or stones. Table (1) shows the preoperative patients' PSA, prostate volume, and residual urine volume.

Acute epididymitis developed in 2/30 (6.6%) patient and treated by appropriate antibiotic.

Within 4 weeks after low – energy TUMT 5/30 (16.6%) patients regained their ability to void spontaneously, while 25/30 (83.3%) patients failed to do so and were considered as a treatment failure group.

Maximum flow rate (Q max.) was determined by uroflowmetry promptly and then serial estimation was carried out until the 12th week post TUMT. An elevation in the mean Q max. was observed by 12 weeks (10.3 ml/s) compared with that at 10 days following decatheterisation (6.1ml/s).

Residual urinary volume decreased from a mean value of 120.5 ml at 10 days after decatheterisation to a mean 79 ml at 12 weeks. The highest measured post voiding residual volume during the follow up period was 140 ml.

Table 1: Patients' criteria prior to TUMT

Clinical parameter	Range	Mean
PSA (ng/ml)	1.0 – 8.8	3.4
Prostate volume (cm ³)	28 – 89	52.1
Residual urine volume (ml)	700 – 1700	1012

DISCUSSION:

Despite the development of new technologies, transurethral resection of the prostate (TURP) is still considered the gold standard for surgical treatment of BPH^(5,6). TUMT and TUNA appear to be more effective than medical therapy but less effective than TURP⁽⁷⁾.

This study used the low – energy TUMT protocol. However high – energy protocol is being used increasingly in many urology centers^(8, 9) not only for treatment of BPH but for a localized prostate cancer⁽¹⁰⁾.

TUMT as a mode of BPH treatment was carried out in Al Karama Teaching Hospital at the end of

1999. It was reserved for BPH patients who were unfit or refuse surgical treatment.

In this study patients selected for TUMT were not classified according to the predetermined prostate volume, maximum flow rate or residual urine volume. Similarly neither the duration of urinary retention in each patient was accurately estimated nor the drugs previously taken for BPH (5α reductase inhibitor or α blocker) were considered. The study also did not report a possible significant statistical difference of patients' International Prostate Symptom Score (IPSS) pre – and post TUMT session.

Certain randomized controlled trials recommended the use of TUMT as an alternative to TURP for symptomatic patients with BPH with no history of urinary retention or previous prostate procedures and prostate volumes between 30 to 100 ml⁽¹¹⁾.

Post TUMT ability of our patients to void spontaneously and the improvements in maximum flow rate and residual urinary volume after 12 weeks from TUMT need to be confirmed among our patients after longer follow up period, which is unfortunately a difficult task for such patients with co morbidities and the lack of awareness of the importance of such follow up by both patients and their relatives.

Five – year follow up of efficacy and safety of minimally invasive treatments for BPH including TUMT was published by recognized urology centers^(12, 13).

CONCLUSION:

TUMT is an alternative choice for the treatment of patients with BPH and chronic medical illnesses or those refusing surgery. However low energy protocol TUMT is not effective to treat patients with urinary retention due to BPH. High energy protocol and heat shock may be more beneficial as a mode of thermotherapy for such patients.

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