

APPLICATION OF TRANSURETHRAL MICROWAVE THERMOTHERAPY FOR PATIENTS WITH ACUTE URINARY RETENTION AND SEVERE COMBINED COMORBIDITY FROM BENIGN PROSTATIC HYPERPLASIA

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Background. The incidence of benign prostatic hyperplasia (BPH) has grown by almost 35 % over the last five years with an incidence rate of 4438.2 per 100 000 of the respective population (147 677 total patients) in Ukrainian men beyond working age in 2007 [3].

Objective. The aim of the study was to assess the efficacy of TUMT in men where BPH was complicated by AUR and severe comorbidities.

Method. TUMT was performed using the domestically produced equipment 'ALMGP-01' at the frequency of 1300 Hz, rectal temperature of 42.5 °C, and urethral temperature of 44.5 °C. The average session duration is 46-55 minutes.

Results and Discussion. Subjective self-assessment: no effect of the procedure was detected (urination not restored) in 9 patients (11.11 %); poor current status with prior temporary improvement (6-9 months of independent urination with repeated AUR) in 14 patients (17.28 %); satisfactory current status with occasional dysuric episodes (however better than pre-TUMT status) in 40 patients (49.38 %). Eight patients (22.22 %) have assessed their status as 'good' and 'excellent'; one patient noted substantial improvement compared to pre-procedure status. The nine patients with lack of success of restoring physiological urination had the following peculiarities: intra-vesical growth of BPH and prostatic volume over 85 cm³ in majority of these patients.

Conclusions. Taking into consideration the minimally invasive nature, favourable tolerability and absence of adverse effects, TUMT can be considered as a method of choice in patients with BPH-triggered AUR and contraindications to major surgical treatments and general anaesthesia. Remote outcomes of TUMT may be evaluated as satisfactory, with good effects in 71.62 % patients. However, in prostatic volumes exceeding 85 cm³ and pronounced intravesical pattern of BPH growth the efficacy of TUMT is arguable.

KEY WORDS: benign prostatic hyperplasia, acute urinary retention, transurethral microwave thermotherapy.

Introduction

Benign prostatic hyperplasia is a very common condition, found in middle-aged, senior and elderly males, according to epidemiological studies [1]. As for the age, the incidence of this disease is up to 85 % [2]. The incidence of benign prostatic hyperplasia (BPH) has grown by almost 35 % over the last five years which is 4438,2 per 100000 of the respective population (147 677 patients) in 2007 in Ukrainian men beyond working age [3].

The pain- and stress-free urination is known to be an essential component of optimal quality of life. However, there are moments when the perception of the quality of life undergoes a radical change. One of such moments is acute urinary retention (AUR). Occasionally, acute urinary retention occurs due to certain triggering factors, such a surgery under

general anaesthesia, excessive fluid intake and medications with sympathomimetic or anticholinergic action [4]. However, the main or principal group consists of over 90% males in whom AUR is a result of natural development of benign prostatic hyperplasia (BPH) [5, 6].

European urological community identified the following risk factors of AUR: age >70 years, prostatic volume >30 cm³, uroflowmetric results <12 mL/sec, IPSS score >7 points, residual urine >50 mL and PSA levels >1.5 ng/mL [7, 8].

It is generally accepted that the principal methods of AUR relief in patients with BPH are short-term bladder catheterisation, trocar-assisted or supra-pubic cystostomy, transurethral resection or open prostatectomy. However, there are situations when despite a disappointing effect of medical management, it is difficult to decide in favour of radical elimination of AUR due to severe comorbidities. Then the physician faces a difficult question how to solve this problem and which treatment modality is best to spare hold the patient harmless and restore spontaneous micturition.

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Throughout the last decades, there has been a search for new therapeutic approaches in symptomatic BPH [9]. For a technique to be recognized as effective it is essential for it to be less invasive and nevertheless effective, to require no general anaesthesia, to have an outpatient option and to have as few complications as possible. One of the urological technology achievements to meet the above criteria is transurethral microwave thermotherapy (TUMT).

The aim of the study was to assess the efficacy of TUMT in men where BPH was complicated by AUR and severe comorbidities.

Methods

The Ternopil University Hospital has purchased and is currently using (since 2002) a local microwave prostatic hyperthermia device (ALMGP-01), manufactured by the JSC RADMIR State Enterprise Company NDIRV (Kharkov). 516 TUMT procedures have been performed in BPH patients with high surgical risk at the Urology Department between years of 2002 and 2013.

Clinical analysis was performed in medical records of 81 (15.69 %) patients with AUR-complicated BPH.

Patient complaints were assessed using the IPSS symptom scale, developed by the American Urological Association, including the quality of life question in dysuric patients (QOL). The volume of the urinary bladder, the thickness of its walls, prostatic size and volume, as well as residual urine were assessed with transabdominal ultrasound. Upper urinary tract function was assessed using radiological and radionuclide method; the levels of prostate specific antigen (PSA) in all patients were within normal limits (up to 4 ng/mL).

Radical surgical techniques for BPH could not be used due to severe concurrent comorbidities in the patients. In the given investigation, twenty-nine patients were diagnosed with coronary artery disease (CAD), diffuse and post-MI atherosclerosis and Class IIa-IIb heart failure; 34 patients had CAD with complicated arrhythmias; 13 patients had residual post-CVA findings; 32 patients had Stage III hypertension; 17 patients had chronic bronchitis, emphysema and Stage II respiratory failure; 8 patients had severe Type 2 diabetes; 21 patients had varicose leg veins with Stage II–III chronic venous failure; 9 patients had Stage II chronic kidney disease; 2 patients had ankylosing spondylitis (Bechterew's disease) and 3 patients had bilateral coxarthrosis. Each of the TUMT patients had three to five concurrent comorbidities.

TUMT was performed using equipment 'ALMGP-01' (Kharkov, Ukraine) at the frequency of 1300 Hz, rectal temperature of 42.5 °C and urethral temperature of 44.5 °C. The average session

duration was 46–55 minutes. According to ultrasound examination, the prostatic volume was within the range of 46 cm³ to 102 cm³, with a size of 74.5 cm³ on average. The patients had a Foley catheter inserted repeatedly and were administered oral antibacterial drugs, usually fluoroquinolones or cephalosporins after completion of the TUMT session. Postoperative hospital stay was 4 to 7 days, 4.92 days on the average. Three days prior to urethral catheter removal, α 1a-adrenoblocker tamsulosin (Omnic 0.4 mg/day) was used. The catheter was removed on Week 4 post-TUMT, after completed resorption of cellular necrosis.

Results

Most patients tolerated the TUMT session favourably. Only 5 patients (6.17 %) had a short-term urethrorrhagia; 2 patients (2.46 %) had an acute pyelonephritis and 2 patients (2.46 %) had a single day urethral fever in post operative period. The patients had the following baseline preoperative findings: IPSS 21.62±1.14 and QoL: 4.42±0.36. The following results were obtained in analysis of these findings 9–12 months post-TUMT: the IPSS score decreased to 18.42±1.63 and the quality of life index (QoL) decreased to 3.07±0.24. Physiological urination was restored in 72 patients (88.89 %) after removal of the Foley catheter. Residual urine in the patients where urination was restored was between 15 and 145 mL, 48.25±18.36 mL on the average. PSA levels were subsequently within normal limits.

Discussion

Subjective self-assessment of TUMT efficacy by the AUR patients was the following: no effect of the procedure was detected (urination not restored) in 9 patients (11.11 %); poor current status with prior temporary improvement (6–9 months of independent urination with repeated AUR) in 14 patients (17.28 %); satisfactory current status with occasional dysuric episodes (however better than pre-TUMT status) in 40 patients (49.38 %). Eight patients (22.22 %) have assessed their status as 'good' and 'excellent'; one patient note substantial improvement compared to pre-procedure status. The nine patients with lack of success restoring physiological urination had the following peculiarities: intra-vesical growth of BPH and prostatic volume over 85 cm³ in majority of these patients.

Within a year's span, post-TUMT surgical treatment was undertaken in 8 patients with lack of independent urination (2 patients had transvesical prostatectomy, 4 patients had TURP and 2 more patients had suprapubic cystostomy placed). One patient refused surgical treatment and was on an indwelling catheter for 3 years already. Concerning the temporary improvement population, 11 patients

had surgeries (4 patients had transvesical prostatectomy, 6 patients had TURP and 1 more patient had suprapubic trocar cystostomy placed). Three patients of this group had repeated TUM session after recurrent AUR with independent urination successfully restored. It is noteworthy that open post-TUMT prostatectomies were associated with difficulty enucleating hyperplastic nodules due to proliferative changes in the nodes and the adjacent tissues. Another peculiar observation was that post-TUMT open prostatectomies, as well as post-TUMT TURP procedures, were associated with less pronounced and shorter haemorrhage.

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Conclusions

Taking into consideration the minimally invasive nature, favourable tolerability and absence of adverse effects, TUMT can be considered a method of choice in patients with BPH-triggered AUR and contraindications to major surgical treatments and general anaesthesia. Remote outcomes of TUMT may be evaluated as satisfactory, with good effects in 71.62 % patients. However, the efficacy of TUMT is arguable in prostatic volumes exceeding 85 cm³ and pronounced intravesical pattern of BPH growth.

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