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Original Article

Bipolar transurethral enucleation and resection of the prostate: Whether it is ready to supersede TURP?

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Abstract *Objective:* According to the EAU Guidelines, transurethral resection of the prostate (TURP) has so far still been considered as the gold standard for surgical treatment for patients with obstructing clinical benign prostate hyperplasia (BPH). However, its relatively high rate of complications and postoperative recurrence necessitates further modification and innovation on the surgery technique. We reported the patient outcomes with our technique.
Methods: We retrospectively analyzed 52 patients with obstructing clinical BPH who underwent bipolar transurethral enucleation and resection of the prostate (B-TUERP) between March 2015 and September 2015. Pre- and perioperative parameters were obtained from medical charts. Postoperative follow-ups were administrated at 1, 3, 6, 12 and 24 month(s) after surgery, respectively.
Results: All the operations were performed successfully with a mean operative time of 43.1 min and an average tissue removal rate of 74.7%. Q_{max} was significantly improved immediately after surgery, followed by a continuous improvement throughout the follow-ups. Following a steep decrease in mean prostate specific antigen (PSA) and post void residual (PVR) observed within the first half year after surgery, the serum PSA was then maintained at a constant level of 0.61 ng/mL. Temporary urinary retention was found in four cases (7.7%). Stress urinary incontinence occurred in five patients (9.6%), with the condition resolved in 1–2 weeks without extra treatment. Urethral strictures and bladder neck contractures, as the most commonly observed long-term complications, developed in four patients (7.7%). No recurrence was found during 2 years of follow-ups. An improvement in International Index of Erectile Function (IIEF-5) scores was witnessed in 17 patients preoperatively with normal sexual function during the first 6 months after surgery, and sustained throughout the 24-month period.

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Conclusions: Enucleation reflects an improvement on surgical technique in many ways with a need for surgical equipment that can be broadly accessible in clinical practice. Currently, bipolar resection is a commonly employed procedure in clinical settings, and its similarity shared with bipolar enucleation technique warrants a quick learning of B-TUERP by urologists. Based on these findings, we believe that the substitution of TURP by TUERP as the gold standard for prostate endoscopic procedure can be expected in the future.

1. Introduction

Lower urinary tract symptoms (LUTS) represent one of the most common clinical complaints in adult men. LUTS can be classified as storage, voiding, and post-micturition symptoms, and are mostly related to clinical benign prostatic hyperplasia (BPH) [1]. Transurethral resection of the prostate (TURP), so far still regarded as the gold standard for surgical treatment for symptomatic BPH, is characterized by immediate removal of the intravesical obstruction and a long-lasting improvement on the symptoms and voiding parameters.

Disadvantages of classical TURP, such as heating of deeper tissue, nerves or muscle stimulation, as well as possible malfunction of cardiac pacemakers, have been broadly recognized by urologists [2]. Absorption of hypo-osmotic irrigation fluid adds to another potential risk for monopolar TURP due to the possibility of causing TUR syndrome [3]. New devices such as the plasmakinetic (PK) system [4] and the transurethral resection in saline (TURis) system [5] invented to overcome these severe complications have shown improved surgical efficiency as compared with conventional TURP, from which patients have benefited a lot as demonstrated by significantly reduced complications, shorter convalescence and satisfactory symptom scores and voiding parameters in the follow-ups.

However, despite of the improvement made for TURP surgical equipment, the principle of this endoscopic surgery and some of the subsequent complications such as the high rate of postoperative recurrence remain unchanged, calling for a substantial innovation on the surgical technique. Under this background, another alternative of TURP, the endoscopic enucleation, was developed in an attempt to overcome these problems.

2. Materials and methods

We retrospectively analyzed 52 patients with symptomatic BPH who underwent bipolar transurethral enucleation and resection of the prostate (B-TUERP) between March 2015 and September 2015 in our institution. All operations were performed by a single surgeon (C. Liu). All patients were evaluated preoperatively by physical examination, digital rectal examination and prostate specific antigen (PSA) measurement. The inclusion criteria for operation were established as patients aging from 50 to 80 years old who were diagnosed with clinical BPH, with a PSA level ranging from 0 to 4 ng/mL and a prostate volume from 40 to 160 mL (by transrectal ultrasound: 0.52 × longitudinal diameter × transversal diameter × vertical diameter). All included patients were identified having at least one of the following conditions: 1) International Prostate Symptom Score (IPSS) ≥12, and the quality of life (QoL) ≥4; 2) Q_{max} ≤15mL/s (voided volume ≥150 mL); 3) Poor response to drug treatment; 4) Recurrent urinary retention; and 5) The Schafer grade ≥2 [6].

Patients with neurogenic bladder, history of lower urinary tract surgery, urethral stricture or prostate/bladder cancer were excluded. Poor general condition of the patient also was classified as one of the exclusion criteria. As for those with an elevated PSA, negative biopsy results before surgery were required for inclusion. The perioperative parameters, including operative time, weight of resected prostatic tissue, catheterization time, and hospital stay, were obtained from medical charts (Table 1). Postoperative follow-ups were carried out at 1, 3, 6, 12 and 24 month(s) after the surgery, respectively, with a thorough record for all the postoperative surgical complications that believed to be associated with the procedure.

2.1. Surgical procedure

The procedure was performed using the Scanmed Plasmakinetic System (Scanmed, Zhuhai, China) with Plasma electrodes as well as a power of 160 W for the cutting and 80 W for coagulating. As described in our previous reports [7,8], the enucleation procedure usually started from the

Table 1 Perioperative data of the patients (n = 52) (mean ± SD).

Characteristic	Value
Age, year	67.9 ± 6.4
PV, mL	72.4 ± 10.2
PSA, ng/mL	2.35 ± 0.92
Operation time, min	43.1 ± 4.0
Enucleation time, min	39.9 ± 3.9
Enucleation weight, g	54.2 ± 8.1
Tissue removal rate, %	74.7 ± 2.6
Decrease in sodium, mmol/L	0.790 ± 0.380
Postoperative irrigation, h	18.4 ± 2.4
Duration of catheterization, h	40.0 ± 6.1
Postoperative hospital stay, h	66.7 ± 6.3