Transurethral resection of the prostate: reaffirming the gold standard

Symptomatic benign prostatic hyperplasia (BPH) occurs in one third of men over the age of 65 years. With an increase in the ageing population of Hong Kong, the number of men suffering from BPH is expected to increase in the next decade. These men will live longer, enjoy a better quality of life, and receive more comprehensive medical care for the remainder of their active lives than the previous generation. The associated costs of managing BPH will consequently and inevitably increase substantially. With finite health care resources, the cost-effective management of BPH will be a major challenge.

The clinical manifestations of BPH are felt to arise from bladder outlet obstruction. Medical and surgical intervention aims to relieve the obstruction. Since the 1990s, the medical management of BPH has improved dramatically and resulted in a sharp decrease in the number of symptomatic patients treated surgically. Prostatectomy and minimally invasive therapies resect or ablate the obstructing tissue. The associated morbidity of minimally invasive therapies is less compared with that of prostatectomy, but such procedures are also less effective.

The study[1] published in this issue of the *Hong Kong Medical Journal* offers some insight into the current surgical management of BPH. Several minimally invasive therapies have been investigated in Hong Kong but have not been subjected to rigorous randomised controlled trials (RCTs). Nonetheless, it is only through properly designed clinical investigations that the true therapeutic benefits of these treatments can be defined.

Interstitial thermal ablation techniques (transurethral microwave thermotherapy [TUMT], transurethral needle ablation [TUNA], and interstitial laser coagulation) using various sources of energy to induce coagulative necrosis and delayed prostate shrinkage have several advantages: minimal or no bleeding, avoidance of transurethral resection of the prostate (TURP) syndrome, and need for less anaesthesia. Patients can also be treated on an out-patient basis. Unfortunately, the development of postoperative oedema and delayed sloughing of tissue as a consequence of the energy-induced coagulative necrosis lead to prolonged urinary obstruction, and patients may require catheterization for up to 3 weeks after treatment. Some of these techniques have a high re-treatment rate (up to 40%) for recurrent obstruction over the next few years and further more aggressive therapy is required.[2] Many of these techniques have thus been largely abandoned.

Minimally invasive therapies have evolved based on the principle of prostatectomy with immediate removal of the obstructing tissue. Such therapies include transurethral vaporisation of the prostate (TUVP), Holmium laser resection of the prostate, and photoselective vaporisation of the prostate (PVP) with KTP laser. Transurethral vaporisation is associated with a high rate of postoperative irritative voiding symptoms, dysuria, urinary retention, and need for unplanned secondary catheterization as a result of postoperative oedema and delayed sloughing of issue. The same occurs following visual laser ablation of the prostate (VLAP) and both procedures (TUVP and VLAP) have been largely abandoned in Hong Kong.

Holium laser resection of the prostate attempts to mimic standard TURP by excising and removing pieces of prostatic tissue transurethrally, thus gradually creating a cavity. Development of a mechanical tissue morcellator has improved the handling of the excised prostatic tissue and has made resection of larger pieces of tissue feasible. Nonetheless, the procedure takes longer operating time than the standard TURP (83±38 minutes vs 58±32 minutes, respectively),[3] and has not been widely adopted by urologists as it is technically challenging. Furthermore, Holmium laser equipment is not widely available, and the cost of purchasing such equipment may prohibit its widespread use.

KTP laser has been used in the last few years for PVP and results in an immediate TURP-like cavity with good haemostasis and minimal scarring. As the tissue is completely vaporised, postoperative histological analysis to rule out prostatic cancer cannot be performed unfortunately. Preliminary results from the first multicentre prospective trial[4] have shown it to be a safe, effective means of achieving symptomatic and urodynamic relief of BPH symptoms. Like many of the surgical alternatives to TURP, this procedure shows early promise and represents the latest evolutionary development in laser prostatectomy. Only randomised comparisons with TURP will confirm whether it presents a worthy alternative or is 'simply a young pretender to the throne'.

Transurethral vaporisation-resection of the prostate (TUVRP) is a modified standard TURP, in which a thick electric loop is used in conjunction with increased electrosurgical settings. It has the advantage of better haemostasis (better vision and easier operation for the surgeons and safer operation for the patients) and less complications secondary to intra-operative bleeding and fluid absorption. The results of a prospective randomised study[5] of TUVRP versus TURP in 136 patients with acute urinary retention secondary to BPH concluded that TUVRP compared favourably with standard TURP in terms of safety and efficacy. Changes in sodium levels were statistically significant, in favour of TUVRP, but not clinically significant. Blood transfusion was required in three patients in the TURP group and the catheterization time was longer.

Plasma kinetic vaporisation of the prostate (Gyrus system) utilises bipolar rather than monopolar currents and saline instead of glycine for irrigation. The risk of TURP syndrome is thus minimised. Preliminary results of a single-blind RCT of Gyrus electrovaporisation versus TURP revealed that improvements in symptom score and flow rates at 1 year were similar.[6] There was no difference in the requirement for irrigation, haematocrit of the effluent, or duration of hospital stay. Nonetheless, the Gyrus group had a recatheterization rate of 30%, 6 times that of TURP. Gyrus electrovaporisation does not appear to offer any advantages over conventional TURP.

For patients in whom surgery or anaesthesia is contraindicated, prostatic stenting can provide a temporary or permanent solution for bladder outlet obstruction caused by BPH. Insertion of prostatic stents is generally easy, immediately effective, and usually performed on an out-patient basis under monitored anaesthetic care or regional anaesthesia. To date, most patients treated with prostatic stents presented with urinary retention and were not sufficiently fit for other procedures. The majority have been able to void successfully after stent placement[7] and did not need an indwelling urethral catheter.

Transurethral ethanol ablation of the prostate induces cell lysis and tissue necrosis by injecting anhydrous alcohol into the prostate. Initial evaluation (unpublished) 10 years ago on a canine prostate model revealed intraprostatic necrosis. The technique was introduced into clinical study in 2004[8] but remains an investigative technique that should not be offered outside the framework of clinical trials.

Despite the increase in the number of surgical alternatives such as TUMT, TUNA, and various forms of laser prostatectomy, TURP and its modified form (TUVRP) remain the gold standard surgical treatment for obstruction due to BPH. Although minimally invasive therapies have not replaced TURP, they are accepted alternatives. They are associated with less morbidity than transurethral surgery due to fewer bleeding and anaesthetic problems. The less invasive alternatives are nonetheless not as effective as TURP. It is thus appropriate to consider them as alternatives to and not a substitute for TURP. The future goal is to achieve the efficacy of prostatectomy and reduced morbidity with the less invasive techniques.

The standard surgical procedures of TURP and TUVRP produce the most significant long-term symptom improvement. The outcome is nevertheless unsatisfactory for up to 30% of patients. The optimal treatment of BPH requires an improved understanding of the pathophysiology and natural history of the disease as well as new technology. Urologists are presently engaged in studies to better define these fundamental aspects of the disease process.

PC Tam, FRCS (Edin), FHKAM (Surgery)
(e-mail:tampc@ha.org.hk)
Department of Surgery
University of Hong Kong
Queen Mary Hospital
Pokfulam Road
Hong Kong

References

1. Sun WH, Man CW, Ngai RL, Wong BT, Yiu TF. Surgical intervention for benign prostatic hyperplasia in Hong Kong. Hong Kong Med J 2005;11:79-84.
2. Floratos DL, Sonke GS, Francisca EA, Kiemeney LA, Debruyne FM, de la Rosette JJ. Long-term follow-up of laser treatment for lower urinary tract symptoms suggestive of bladder outlet obstruction. Urology 2000;56:604-9.
3. Matsuoka K, Iida S, Tomiyasu K, Shimada A, Noda S. Transurethral holmium laser resection of the prostate. J Urol 2000;163:515-8.
4. Te AE, Malloy TR, Stein BS, et al. Photoselective laser vaporization of the prostate (PVP) for treatment of benign prostatic hyperplasia (BPH): the first multi-center prospective trial. J Urol 2003;169(4 Suppl):465S.
5. Wong BB, Cheung MC, Leung SY, Lee FC, Tam PC. A prospective, randomized study comparing transurethral resection of prostate (TURP) with transurethral resection-vaporization of prostate (TURVP) on treatment for acute urinary retention. Int J Urol 2004;11(Suppl):A11-12.
6. Dunsmuir WD, McFarlane JP, Tan A, et al. Gyrus bipolar electrovaporization vs transurethral resection of the prostate: a randomized prospective single-blind trial with 1 y follow-up. Prostate Cancer Prostatic Dis 2003;6:182-6.

7. Yip KH, Lee F, Tam PC, Ho KK. Urolume prostatic stents for urinary retention due to benign prostatic hypertrophy in patients with high medical risks. Hong Kong Med J 1997; 3:136-40.

8. Leung SYL, Cheung MC, Wong BBW, Lee FCW, Tam PC. Transurethral ethanol ablation of the prostate (TEAP) for the management of acute retention of urine in patients with compromised medical risks. Int J Urol 2004;11(Suppl):A48-49.