

Alternative therapy for BPH

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Can terazosin (alpha-blocker) relieve acute urinary retention and obviate the need for an indwelling urethral catheter?

Peter S.F. Chan, W.S. Wong, L.W. Chan and C.W. Cheng
Department of Surgery, The Chinese University of Hong Kong, Prince of Wales Hospital, Shatin, Hong Kong

Introduction: The waiting list of TURP for patients admitted to our unit with acute urinary retention was 6–8 weeks. Alpha-blockers have been used extensively in the treatment of prostatism, but scarcely in acute urinary retention. This small study aimed to determine if Terazosin could relieve acute urinary retention and obviate the need for a urethral catheter.

Patients and method: Thirty men admitted with acute urinary retention were randomized to one of three groups: placebo, Terazosin 5 mg and Terazosin 10 mg daily. The patient took one dose of medication followed by catheter removal 2 h later. Patients who subsequently failed to urinate were assigned for TURP, the others continued with their respective medication. Uroflowmetry and residual urine were recorded for patients who could urinate before discharge on the same day; these were repeated one month after discharge.

Results: Two of 13 patients on placebo could urinate after catheter removal, compared with six of eight and seven of eight patients on Terazosin 5 mg and 10 mg, respectively ($P = 0.0017$). One patient from each group went into acute urinary retention again within one month. The mean peak flow rate before discharge of the three groups were respectively 7.6, 15.8 and 8.5 mL/s and after one month, 11, 16.1 and 6.75 mL/s. Residual urine volume increased in all three groups after one month. One patient on Terazosin (10 mg) had symptomatic hypotension, refused medication and hence was excluded.

Conclusion: Terazosin was effective in relieving acute urinary retention; 5 mg daily was adequate and preferable to 10 mg daily. Its long-term efficacy in preventing recurrent urinary retention needs to be evaluated.

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Quantification of outflow function provides an algorithm to select patients for thermotherapy

P. Javle, M. Blair, M. Palmer and K.F. Parsons *Department of Urology, Royal Liverpool University Hospital, Liverpool*

Introduction: It has been suggested that the results of transurethral thermotherapy (TT) for symptomatic BPH are dose-dependant, i.e. 'ablative treatment' (intraprostatic temperatures > 55°C) achieves better results, although it is associated with a marked increase in the incidence of side-effects. However, the results of several clinical trials on the use of ablative thermotherapy are contradictory. We investigated whether quantification of outflow function improves patient selection for the use of an 'ablative' thermotherapy device (T3 Urologix) which has a focused-energy delivery system.

Patients and methods: Fifty men with symptomatic BPH and an AUA symptom score > 12, peak flow rate (Q_{max}) < 13 mL/s and significant residual urine underwent routine pressure flow studies (PFS). The PFS data were analysed to record P_{mu0} (the lowest detrusor pressure at which flow starts or ends) and $p_{det} Q_{max}$ (the detrusor pressure at peak flow rate). These results were used to grade the degree of obstruction into three groups: unequivocally obstructed (OB), the equivocally obstructed (EQ) and unobstructed, using a modification of Schäfer's linear passive urethral resistance relation classification. Transurethral thermotherapy was delivered for one hour on an outpatient basis in each patient. Post-operative outcome was assessed at 3, 6 and 12 months by symptom score, uroflowmetry and ultrasonography (residual urine).

Results:

	OB group (n = 23)			EQ group (n = 36)			P value
	Pre-TT	12 m post-TT	% Change	Pre-TT	12 m post-TT	% Change	
Symptom score	20.8 (1.4)	9.4 (1.7)	55	19.5 (0.9)	5.3 (0.6)	73	0.002
Q_{max} (mL/s)	8.7 (0.4)	11.9 (0.3)	36	9.2 (0.4)	15.1 (0.4)	65	0.001
Residual urine (mL)	118.8 (11)	90.8 (13)	23	120 (5)	55.6 (5)	55	0.004

The results are presented as mean (SEM) with the % change and the P value for the significance of the difference between the groups 12 months after thermotherapy. Although there was no significant difference in any of the variables between the OB and EQ groups before therapy, the difference between these groups 12 months after treatment was highly significant. Furthermore, the incidence of complications was significantly higher in the OB group.

Conclusion: The results of this study suggest that thermotherapy is more appropriate for patients with mild obstruction. Furthermore, it may be possible to stratify therapeutic options based on individual grade of obstruction.

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Low and high energy TUMT: the relation between de-obstruction and morbidity

U. Jonas, K. Hofner, L. Miano, A. Tubaro, S. Carter, B. Di Pasquale, J. de la Rosette and F. Debruyne *Charing Cross Hospital, London, UK. Hannover, Germany; L'Aquila, Italy; Nijmegen, The Netherlands*

Introduction: The effectiveness of transurethral microwave thermotherapy (TUMT) Prostatsoft 2.0 (low-energy treatment) has been well documented. Data are now available from high-energy TUMT-2.5 from four centres of the European BPH Study Group.

Patients and methods: A total of 97 patients with BPH were treated by TUMT 2.0 and 85 patients by TUMT 2.5 and the treatment outcome retrospectively compared.

Results:

	Follow-up	TUMT 2.0	TUMT 2.5	2.0 vs 2.5 (P <)
Madsen score	pre	13.9	13.9	0.894
	6 months	5.3	5.9	0.374
	P <	0.000	0.000	
	Difference	-8.7	-7.7	0.256
Q_{max} flow rate mL/s	pre	8.6	9.6	0.040
	6 months	11.8	14.7	0.001
	P <	0.000	0.000	
	Difference	3.2	5.1	0.034
Residual urine volume mL	pre	105.5	83.4	0.029
	6 months	71.7	29.3	0.001
	P <	0.000	0.000	
	Difference	-33.9	-39.7	0.792
$P_{det} Q_{max}$ cmH ₂ O	pre	74.2	62.7	0.015
	6 months	72.7	38.9	0.000
	P <	0.713	0.000	
	Difference	1.5	-23.8	0.000
linPURR	pre	4.3	2.9	0.000
	6 months	4.1	1.3	0.000
	P <	0.404	0.000	
	Difference	-0.1	-1.2	0.000

The results show a comparable effect on symptoms whereas the effect on obstruction was far greater with 2.5 TUMT. However, there was a higher rate of morbidity in terms of treatment pain, retrograde ejaculation (0.1% vs 44%) and post-treatment retention (22% vs 49%—one week) with 2.5.

Conclusions: The choice between TUMT 2.0 and 2.5 should be made on the grade of bladder outflow obstruction, taking into account the associated morbidity.

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The Oxford laser prostatectomy trial: one-year data from a randomized controlled trial

S.R. Keoghane, K.C. Lawrence, H.A. Doll and D.W. Cranston
Department of Urology, The Churchill Hospital Oxford and the Health Services Research Unit, University of Oxford

Patients and methods: A total of 152 patients with clinical BPH were randomized to undergo TURP, or contact vaporization laser prostatectomy using the SLT MTRL 10 600µm probe. The AUA-7 symptom score was the defined primary outcome, with peak urinary flow rate (Qmax), BPH impact index and quality of life (QOL), as measured by the Short Form (SF)-36, as secondary outcomes.

Results: One-year data are available on 127 patients. The re-operation rate in the TURP arm was 6.6%. The 'failure rate' in the laser arm, which includes peri-operative conversion to TURP and re-operation, was 18.4%. Mean values and the mean change from baseline are shown below (Mann-Whitney *P*-values are given for laser v TURP).

	Pre-op (mean)		1 Year (mean)		<i>P</i> -value	Mean change		<i>P</i> -value
	Laser	TURP	Laser	TURP		Laser	TURP	
AUA score	20.9	19.4	8.7	5.8	0.006	10.9	13.3	ns
BPH impact index	5.8	5.9	2.5	1.6	ns	3.3	4.3	ns
Q max (mL/s)	12.8	11.4	17.1	21.2	0.025	6.2	9.4	ns

Significantly, more patients in the TURP group achieved a *large* (8 point or more) change in AUA symptom score at 1, 3 and 12 months. There was no statistical correlation in either group between pre-operative prostate volume and improvement in AUA symptom score at 1 year.

Conclusion: At 1 year, there was no statistically significant difference between TURP and contact laser prostatectomy with regard to *absolute change* in AUA-7 symptom score. Failure of trial without catheter and re-operation rate were higher in the laser arm. Very little change occurred in QOL as measured by the SF-36 between baseline and 1 year.

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A prospective randomized trial of interstitial radiofrequency therapy (ITTP) versus transurethral resection for benign prostatic obstruction

Hugh Mostafid, Guy Dawkins, Philip Thomas, Matthew Fletcher and Neville Harrison
Dept. of Urology, Brighton General Hospital, Elm Grove, Brighton, BN2 3EW

Introduction: Interstitial radiofrequency therapy (ITTP) is a new technique for the treatment of benign prostatic obstruction, using a disposable needle-electrode and a standard diathermy generator. A randomized trial was carried out to assess the effectiveness of ITTP versus TURP in benign prostatic obstruction, using symptom scores and pressure flow studies (PFS) as outcome measures.

Patients and methods: A total of 50 patients with urodynamically proven bladder outflow obstruction was assessed using the IPSS, peak urinary flow rate (PFR) and bladder residual volume (RV). They were then randomized to receive ITTP or TURP. Following treatment, patients were reassessed at 6 months using a further PFS, IPSS, PFR and RV.

Results: Outcome data at 6 months are available on 25 patients (12 ITTP, 13 TURP). Median IPSS scores decreased from 26 to 8 in the ITTP group and from 26 to 4 in the TURP group. Mean peak detrusor

voiding pressure (Pdet Qmax) fell from 110 to 70 cmH₂O in the ITTP group and from 110 to 46 cmH₂O in the TURP group. There was a negligible increase in mean PFR from 8.2 to 8.7 mL/s in the ITTP group but mean PFR increased from 9.7 to 21.3 mL/s in the TURP group. Mean RV fell from 74 to 54 mL in the ITTP group but increased from 85 to 124 mL in the TURP group. Both groups are as yet too small to allow statistical analysis.

Conclusions: Although ITTP produced a clinically significant reduction in the IPSS at 6 months that was similar to TURP, the reduction in Pdet Qmax was less marked. TURP must continue to be the treatment of choice for the relief of benign prostatic obstruction. However, the low morbidity, simplicity, cost, and effectiveness of ITTP in relieving lower urinary tract symptoms suggest that it may have a useful role to play in the treatment of certain subgroups of patients with symptomatic prostatic enlargement.

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A study of factors that influence soft-tissue clearance rates during electrosurgical vaporization

Anup Patel, Lisa Lim, Thomas Ryan and Gerhard J. Fuchs
UCLA Division of Urology and Valleylab, 66-133 Center for Health Sciences, Box 951738, Los Angeles, California, 90095-1738, USA

Introduction: As a natural evolution of electrosurgical loop resection, electro-vaporization (which combines tissue removal with good haemostasis) has been used increasingly to create a cavity in the prostate during transurethral surgery in men with symptomatic BPH. Using this method, tissue clearance rates can be influenced by several variables, such as electrode surface configuration, radio-frequency (RF) waveform and generator power output, rate of electrode excursion, contact pressure and irrigant. These have been studied systematically in a laboratory model, using fresh skeletal muscle tissue.

Materials and methods: For each variable tested, a monopolar electrode was fixed to the weighted arm of a linear-motion system and rolled across the tissue surface in a fluid environment (3.3% sorbitol), while activated by a RF generator. Five sequential furrows were created. The tissue samples were flash frozen and bisected longitudinally to allow measurement of the resulting furrow, using an optical imaging technique. Tissue clearance rates were thus calculated.

Results: The volume of tissue removed increased significantly when power was increased from 120 to 150W (46 to 119 mm³, *P* = 0.006), when the load was increased from 20 to 50g (20 to 119 mm³), and when the excursion rate was decreased from 25 to 15 mm/s (29 to 69 mm³, *P* < 0.05) and from 15 to 10 mm/s (69 to 137 mm³, *P* < 0.05). Increases in power to 180W or in load to 70g did not significantly increase the volume of tissue removed, suggesting that these factors were constrained with regard to optimal tissue clearance.

Conclusions: Our laboratory model of quantifying tissue removal rates during electrovaporization has allowed a standardized method of evaluating the numerous variables that control efficient soft-tissue electrovaporization. The results show that within certain limitations, greater removal of fresh tissue can be achieved by increasing power, increasing the load and decreasing the excursion rate.

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Robotic transurethral electrovaporization of the prostate

M.S. Nathan, S.J. Harris, B. Davies, R. Hibberd, J. Buckley and J.E.A. Wickham
Department of Minimally Invasive Therapy, Guy's Hospital, London, SE1 and Department of Mechatronics, Imperial College of Science, Technology and Medicine, London, SW7

Introduction: To quicken and partially de-skill transurethral electrovaporization of the prostate (TVP), decrease the surgeon's workload and increase the throughput of patients, a system to automate TVP was developed; the Probot. It was also intended that the Probot would be a generic demonstration tool for other automated endoscopic procedures.

Materials and methods: The Probot consists of a motorized safety frame attached to an electronic counterbalance and controlled by a motion controller and a computer; the computer is also linked to a transurethral ultrasonography (TUUS) unit, a diathermy unit and a camera system. A modified 25 Ch resectoscope (Baumrucker, US) carrying a VaporTrode™ electrode moves on the safety frame and is the end-effector. After a preliminary cystoscopy, the resectoscope is positioned at the bladder neck. Prostatic dimensions are obtained from TUUS and a computerized three-dimensional model generated, from which the area of vaporization is delineated. The procedure is carefully monitored both visually and by referring to computer-generated images superimposed on the TUUS images.

Results: Preliminary results from five patients in a current trial showed significant improvements in the symptoms and urinary peak and mean flow rates over a mean follow-up of 90 days. The mean vaporization time (1.7 g/min), the irrigation time (147 min), the duration of post-operative catheterization (11 h) and a mean hospital stay of 2 days were encouraging. No patients developed peri- or post-operative complications.

Conclusions: The Probot de-skilled the operation but for safety reasons the speed is presently set to a minimum; if the process proves to be consistently safe, it could be accelerated and thus achieve the full benefit.

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Endoscopic laser ablation of the prostate – 2-year follow-up of 105 patients treated at one institution

M.J. Bailey, M.J. Lynch and G.B. Boustead *Department of Urology, Epsom General Hospital, Epsom, Surrey*

Introduction: Endoscopic laser ablation of the prostate (ELAP) has been promoted as an alternative to TURP for patients with symptomatic BPH. Studies have demonstrated good early results but the durability of the procedure remains in question. The aim of this study was to evaluate whether the early results of ELAP were maintained. Two or more years after ELAP patients were reviewed with an AUA symptom score, uroflowmetry and questions about sexual function.

Patients and methods: Of the 250 patients treated with ELAP, 123 have completed 2 years of follow-up and their outcome is presented. Six had died of unrelated causes, 12 had needed further surgery for BPH and 12 did not attend for review. The mean follow-up in the 93 patients studied was 28.5 months.

Results:

	Pre-ELAP	6 months	24 months*
AUA score	21	3.7	5.1
Q max mL/s	9.2	17.2	16.3

*or at the time of re-operation in the 12 patients having revision surgery.

The re-operation rate was 12% at 2 years and following review, a further seven patients were found to be symptomatically obstructed, an overall failure rate of 19%. This is higher than most reported series after TURP.

Conclusion: The benefits of shorter convalescence and the likely preservation of antegrade ejaculation after ELAP may outweigh the possibility of requiring a further procedure for younger men. Elderly and frail patients benefit from the less-invasive nature of the procedure. Thus, there is a place for ELAP in the management of BPH, but the durability of ELAP compared with TURP must be explained to patients.

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Laser prostatectomy: 3-years follow-up, a cause for concern

R. McGregor, G. Dawkins, R. Thilagarajah, K. Anson and R. Miller *Whittington Hospital, Highgate Hill, London, N19*

Introduction: Laser prostatectomy for the treatment of benign prostatic obstruction was first performed in humans in 1991. Advantages of laser therapy over conventional electrosurgical resection include reduced intra- and post-operative bleeding and reduced in-patient stay, with a subsequent increase in patient turnover. Laser prostatectomy is now commonly performed as day-case surgery. Results in the short term are encouraging, but data on the longer-term durability of the procedure are sparse.

Patients and methods: A total of 128 treatments were performed in 126 patients. Assessment was by AUA symptom scores, urinary flow rates and residual urine and 126 treated cases were reviewed. The mean follow-up was 2 years 8 months (range 20–45 months). Failure of treatment was taken as fulfilling the entry criteria for treatment at the last point of follow-up.

Results:

Success	Failure	Further action (% of 126)
33%	45%	Pending further treatment (16)
AUA < 15	AUA > 15	TURP (15)
Median 7	Median 21	Bladder neck incision cicatrizing scar (12)
Lost to F/U (13%)	Died 8%	Urethrotomy (2)

Conclusions: The short-term outcome after laser prostatectomy was satisfactory. This study shows a significant failure rate. Bladder neck cicatrization is a significant complication which can be difficult to treat. The long-term cost-effectiveness of this technology is now brought into question; the results are inferior to TURP. The need for longer-term prospective studies of 'novel' treatments is reinforced.

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12 months follow-up of transurethral needle ablation (TUNA™)

K.L. Potts, D. Rosario, H.H. Woo, L. Byrne, P. Cutinha, K.J. Hastie and C.R. Chapple *Royal Hallamshire Hospital, Glossop Road, Sheffield, S10 2JF*

Introduction: Transurethral needle ablation of the prostate (TUNA™) has been described for the treatment of symptoms associated with bladder outflow obstruction, with promising initial results. This prospective study was carried out to provide long-term follow-up data.

Patients and methods: Seventy-one symptomatic men were recruited. All subjects had unequivocal outflow obstruction on cystometry. Follow-up included symptom scores and uroflowmetry at 1, 3 and 12 months, TRUS at 6 months and cystometry at 3 and 12 months. All adverse events were documented. Results were expressed as mean (SEM).

Results: The 12-month follow-up was available in 67 of the 71 patients. At 3 and 12 months, the IPSS fell from 22 (1.7) to 10 (1.5) and 10 (1.8) and Qmax improved from 8.8 (0.7) to 12.0 (1) and 11.5 (1.9) mL/s (n = 58), respectively; 39 men have had repeat cystometry. In these, the PdetQmax fell from 97 (8) cmH₂O at baseline to 79 (6) cmH₂O at 3 months (p < 0.05) and 84 (10) cmH₂O at 12 months (NS), 79% remain obstructed. Overall assessment based on the quality of life assessment at 12 months showed 56% to be satisfied, 17% to have mixed feelings and 26% to be dissatisfied; 19 patients have opted for TURP during the review period. Of the adverse events, one death unrelated to treatment occurred and two patients have complained of persistent scrotal and perineal pain. No serious long-term sequelae occurred.

Conclusion: In this group, 56% were satisfied and 19 proceeded to TURP. TUNA™ is a safe technique which can be administered under local anaesthetic and produces marked symptomatic improvement. In the majority of patients there was no resolution in the urodynamic criteria of obstruction.