Lower urinary tract symptoms in the male
Benign prostatic hyperplasia

The treatment of lower urinary tract symptoms is tailored according to the degree of bother, the severity of the symptoms, the wishes of the patient, and a full discussion of each option, ranging from conservative measures to surgery.

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An overlap exists between benign prostatic hyperplasia (BPH) and the development of lower urinary tract symptoms ('LUTS'). BPH is a noncancerous condition characterised by a gradual increase of glandular and fibromuscular tissue in the central area of the prostate. Lower urinary tract symptoms can be grouped into two categories: obstructive and irritative.

Microscopic BPH affects 55% of men aged between 60 and 70 years and 80% of men aged between 70 and 80. It is estimated that 10 to 30% of men will eventually require surgical treatment for this condition. BPH does not occur in the absence of testicles and is more prevalent with increasing age.

Approximately 50% of men older than 60 years have significant symptoms of bladder outlet obstruction that affect their quality of life. Such effects include disruption of sleep, limitation of fluid consumption, inability to drive for longer than two hours, and considerable impact on the ability to participate in social events (e.g. going to the theatre).

Pathophysiology

BPH can cause urinary symptoms by causing obstruction or by leading to secondary detrusor response causing bladder hypertrophy and detrusor instability. The obstruction may be due to direct compression of the prostatic urethra or excessive tone within the smooth muscle components of the prostate.

Lower urinary tract symptoms, among other causes, may also be due to bladder overactivity,

IN SUMMARY

- **The degree to which the urinary symptoms affect the patient's quality of life is very important. Assessing the 'degree of bother' helps determine the man's perception of the severity of his symptoms and contributes to both the patient and physician deciding on the most appropriate management strategy.**
- **In most patients, the symptoms gradually worsen over the years, but conservative measures will often suffice for a long time, together with follow up.**
- **Transurethral resection of the prostate (TURP) gives the best success rate in decreasing symptoms, especially when the symptoms are severe.**
- **Transurethral incision of the prostate (TUIP) is better suited to the smaller prostate; it has fewer side effects than TURP.**
- **There are now several alternative surgical techniques for BPH. Some are promising, but all are still experimental.**

bladder underactivity or other causes of infra - vesical pathology (urethral stricture or overactivity of the sphincter). There are many medical conditions that increase the severity of lower urinary tract symptoms, such as medication, confusion, impaired mobility, reduced manual dexterity with clothing, constipation, polyuria, acute medical illness and environmental factors. Finally there are some medical conditions that may directly contribute to urinary symptoms, including dementia, stroke, alcoholism, Parkinson's disease, multiple sclerosis and diabetes.

Clinical assessment

The clinical assessment of lower urinary tract symptoms comprises three main components:

- determining why the patient presented
- assessing the severity and type of urinary symptoms
- assessing the degree to which these symptoms bother the patient.

Determining why the patient presented

Patients may present for reassurance, often concerned about prostate cancer, or they may be genuinely bothered about their urinary symptoms and are seeking to treat these.

It is always worthwhile for the GP to ask patients three simple questions, even when they do not present with urinary symptoms:

- Is your urinary stream reduced?
- Do you get up at night to void?
- Are you bothered by your bladder symptoms?

These questions will often prompt the conversation from an embarrassed patient.

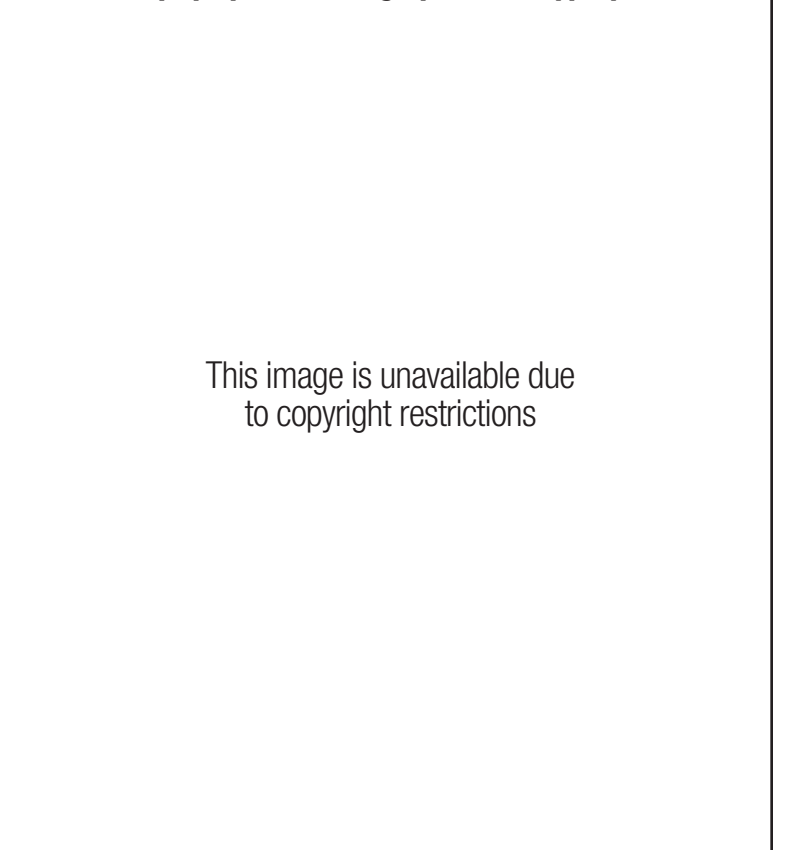
Assessing the severity and type of symptoms

As mentioned previously, lower urinary tract symptoms comprise obstructive and irritative symptoms (Table 1). When the symptoms are predominantly irritative, one must be suspicious of other pathologies (Table 2).

It is also important to exclude other urinary symptoms such as haematuria, dysuria, suprapubic pain and incontinence, each of which requires different investigations. Macroscopic haematuria, for example, requires a cystoscopy and intravenous pyelogram plus ultrasound.

All the above patients should then have the severity of their symptoms quantified using a

Urinary symptoms: benign prostatic hyperplasia



Approximately 50% of men over 60 have significant symptoms of bladder outlet obstruction that affect quality of life. Benign prostatic hyperplasia can cause urinary symptoms by causing obstruction or by leading to secondary detrusor response causing bladder hypertrophy and detrusor instability.

Table 1. Lower urinary tract symptoms

Obstructive

- Hesitancy
- Reduced stream
- Post-micturition dribble
- Feeling of incomplete emptying

Irritative

- Nocturia
- Frequency
- Urgency
- Urge incontinence

continued

Table 2. Differential diagnosis of irritative symptoms

- Infection (prostatitis or cystitis)
- Bladder cancer
- Bladder stones
- Neurogenic bladder
- Bladder instability
- Prostate cancer

Table 3. Indications for referral

- Prostate cancer suspected (after digital rectal examination or prostate specific antigen)
- Predominantly irritative symptoms
- Raised creatinine
- Haematuria
- Moderate or severe symptoms
- Failed initial treatment
- Complications of BPH (retention, recurrent UTIs, high residual, bladder stone, renal failure)

prostate symptoms score, known as the International Prostate Symptom Score (IPSS; see the box on page 24). This allows us to quantify objectively the patient's symptoms. The score involves seven questions, each with a maximum score of 5, hence allowing a total score of 35. Scores between 0 and 7 are considered mild, 8 to 18 moderate, and 19 to 35 severe.

Assessing the 'degree of bother'

The degree to which urinary symptoms affect quality of life is also very important. To assess quality of life, a question of degree of bother has been designed to complete the IPSS (see the box on page 24). This degree of bother helps determine the man's perception of the severity of symptoms and contributes to both the patient and physician deciding on the most appropriate management strategy.

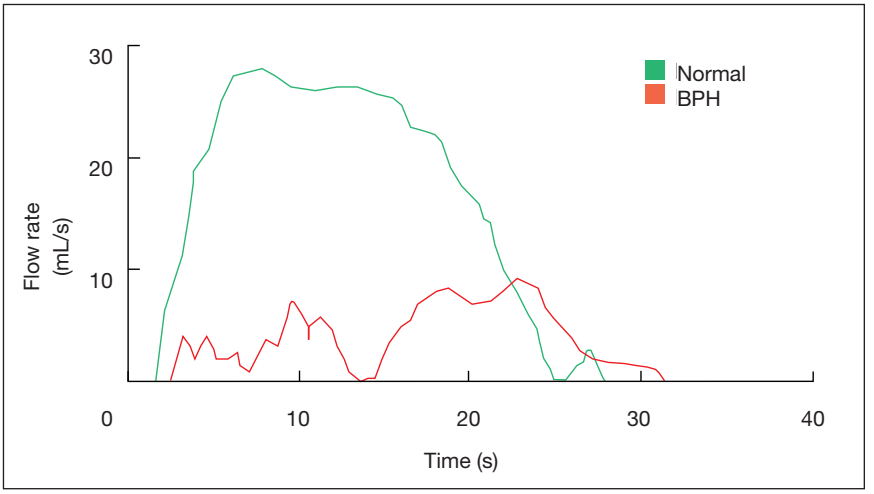


Figure 1. Urinary flow rate. Normal micturition compared with the outflow obstruction of benign prostatic hyperplasia.

Examination and investigation

Examination

Careful genitourinary examination, as well as general physical examination, is required to assess for bladder or renal masses. A digital rectal examination, usually in the left lateral position, is vital – paying attention to size, shape and consistency of the prostate.

Investigation

Initially, investigation should include:

- urine analysis or mid-stream urine
- serum creatinine
- urinary ultrasound (including bladder residual)
- prostate specific antigen (PSA) – when prostate cancer is suspected or when the patient wishes to be screened
- a voiding diary – to document the nature and degree of urinary frequency, to assess fluid intake, and to assess if fluid excretion at night is inappropriately high
- a plain x-ray of the kidneys, ureters and bladder (KUB).

Other investigations include:

- urine cytology if urgency or haematuria are predominant symptoms
- intravenous pyelogram if haematuria is present.

Initial management

The management of lower urinary tract symptoms is summarised in the flowchart on page 29.

Patients with lower urinary tract symptoms do not require a referral to a urologist if the symptoms are mild to moderate with a low 'bother score'. There must also be no suspicion of malignancy and a minimal (less than 50 mL) bladder residual. These patients may simply be reassured that they do not have prostate cancer and be managed with a watchful waiting policy or with herbal treatments, or commenced on alpha-1 blockers or 5-alpha reductase inhibitors.

The indications for referral are covered in Table 3.

If referral is necessary, the urologist will perform some, or all, of the following investigations:

- urinary flow rate (Figure 1)
- urodynamic assessment
- cystoscopy – which can be done with local anaesthetic and flexible cystoscopes on an outpatient basis (Figure 2)
- transrectal ultrasound scanning and biopsies (Figure 3) – when prostate cancer is suspected.

Treatment options

The treatment options are covered in Table 4. The principles of treatment are:

- choose treatment based on symptoms and degree of bother
- reassure the patient regarding prostate cancer
- try noninvasive treatments first, especially in mild to moderate cases
- consider surgical treatment in patients with moderate to severe urinary symptoms
- advise surgical treatment for those people with complications of BPH or those who have tried, or dislike, medications and are willing to accept the side effects of surgery and are fit for surgery
- try minimally invasive surgery in those patients with moderate to severe symptoms who have some special requirement or wish to avoid some side effects of transurethral resection of the prostate (TURP).

Wait and watch therapy

Wait and watch therapy is ideal for patients with mild, and occasionally moderate, urinary symptoms with a low bother score. In most patients, the symptoms gradually worsen with time. There is a 2 to 2.5% chance of urinary retention per year on this policy. In patients with moderate symptoms there is a 25% risk of need for TURP in four years. These people need regular 6- to 12-month follow up with clinical assessment, possibly supplemented by urinary ultrasound, serum creatinine, PSA and digital rectal examination. Useful hints to avoid urinary retention in those patients wishing to avoid surgery are included in Table 5.

Patients who have predominantly nocturia may be helped by:

- decreasing fluids after 6.00 p.m.
- excluding conditions such as diabetes and heart failure
- explaining that nocturia is often not alleviated by TURP
- selectively using desmopressin acetate (Minirin) to improve the concentration of urine in those patients with unexplained polyuria at night.

Finally, it is important to work out whether the nocturia merely reflects an abnormal sleeping pattern (sleep apnoea or insomnia).

Furthermore, patients with urgency and frequency may often be managed with bladder training and avoidance of some beverages such as tea, coffee and alcohol.

Phytotherapy (herbal treatments)

Phytotherapeutic agents (plant extracts) are reported to have few side effects and to have high patient satisfaction. However, only a few randomised clinical trials have been done. Short term studies with small numbers of patients have demonstrated that *Serenoa repens* (saw palmetto), certinin pollen extract, and beta sitosterol may have a beneficial impact on symptom scores and flow rates. However, their toxicity and side effects have not been well established, and although short term use appears to be safe, it is not possible to anticipate whether the same safety will pertain with

Table 4. Treatment options

- Wait and watch
- Herbs (phytotherapy)
- Alpha blockers (prazosin [Minipress, Mipraz, Prasig, Pressin], terazosin [Hytrin])
- 5-Alpha reductase inhibitors (finasteride [Proscar])
- Minimally invasive surgery
- Transurethral resection of the prostate (TURP) or transurethral incision of the prostate (TUIP)

Table 5. Hints to avoid urinary retention

- Avoid certain medications (pseudoephedrine, antidepressants, antihistamines)
- Avoid 'holding on' (e.g. on long journeys by car or plane)
- Take care with anaesthetics
- Keep warm in cold weather
- Avoid alcohol excess
- Avoid constipation

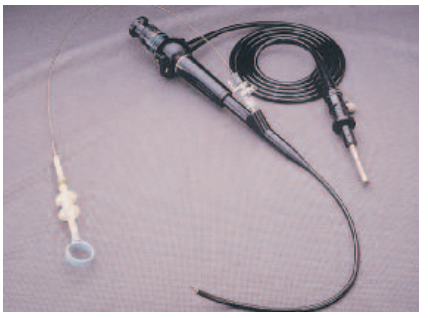


Figure 2 (above). A flexible cystoscope.

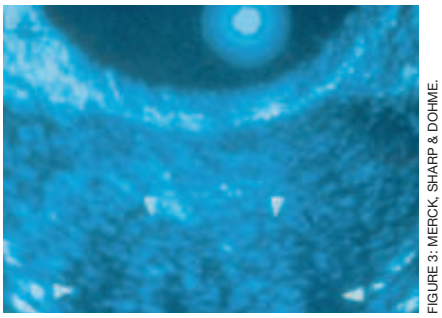


FIGURE 3: MERCK, SHARP & DOHME.

Figures 3a (above) and b (above right). a. Transrectal ultrasound of the prostate. b. Ultrasound scan. Biopsy is carried out under ultrasound guidance.

continued

Prostate symptom score sheet*

Patient name Date

	Not at all	Less than 1 time in 5	Less than half the time	About half the time	More than half the time	Almost always	Your score
1. Incomplete emptying Over the past month, how often have you had a sensation of not emptying your bladder completely after you finished urinating?	0	1	2	3	4	5	
2. Frequency Over the past month, how often have you had to urinate again less than two hours after you finished urinating?	0	1	2	3	4	5	
3. Intermittency Over the past month, how often have you found you stopped and started several times when you urinated?	0	1	2	3	4	5	
4. Urgency Over the past month, how often have you found it difficult to postpone urination?	0	1	2	3	4	5	
5. Weak stream Over the past month, how often have you had a weak urinary stream?	0	1	2	3	4	5	
6. Straining Over the past month, how often have you had to push or strain to begin urination?	0	1	2	3	4	5	
7. Nocturia Over the past month, how many times did you most typically get up to urinate from the time you went to bed at night until the time you got up in the morning?	None 0	1 time 1	2 times 2	3 times 3	4 times 4	≥ 5 times 5	
TOTAL PROSTATE SYMPTOM SCORE							
Quality of life due to urinary symptoms If you were to spend the rest of your life with your urinary condition just the way it is now, how would you feel about that?	Delighted 0	Pleased 1	Mostly satisfied 2	Mixed satisfied & dissatisfied 3	Mostly dissatisfied 4	Unhappy 5	Terrible 6

* The International Prostate Symptom Score. Source: Cockett, et al. Proceedings of the Second International Consultation on Benign Prostatic Hyperplasia, Channel Islands. Geneva: WHO, 1994.

Table 6. Side effects of TURP*

Side effect	Frequency
Retrograde ejaculation	75%
Impotence	3 to 15%
Stress incontinence	<2%
Urethral stricture	3%
Bladder neck contracture	1.5%
Postoperative retention (bleeding)	1%
Re-treatment	1 to 2% per year
TURP syndrome	Rare
Transfusion	2%

* Depends on surgeon, size of prostate and health of patient.

longer term use. Also, because these products are not subject to the same therapeutic assessment standards of conventional pharmaceutical products, the side effects are poorly documented.

Pharmacological management

Alpha adrenergic blocking agents

Alpha adrenergic blockers are generally better than placebo but significantly less effective than TURP. The commonest side effects are light headedness, tiredness and lethargy. Special care must be taken in the elderly and frail, who may develop postural hypotension and collapse. The effect is usually rapid.

Prazosin (Minipress, Mipraz, Prasig, Pressin) must be gradually titrated from 0.5 mg daily to reach 2 mg twice daily or until a clinical response is obtained. Standing and lying blood pressures should be carefully monitored during starting and adjustment of doses. Other common side effects are palpitations, oedema, nausea, dry mouth, erectile dysfunction and headaches.

Terazosin (Hytrin) is a more selective drug which is administered daily and must also be titrated. Approximately 10% of patients will stop the treatment because of the side effects. Generally the dose is increased slowly from 1 mg to 5 to 10 mg daily and is ideally given at night to minimise side effects. It is not on the free list.

5-Alpha reductase inhibitors

Finasteride (Proscar) is used to inhibit the intracellular conversion of testosterone to di-hydrotestosterone and results in a reduction in prostate size. It takes a minimum of three months for a benefit to occur, and if there has been no significant improvement in six to nine months, treatment should be discontinued. Side effects include impotence, decreased libido and decreased volume of ejaculate. These occur in 5 to 10% of people.

Finasteride is most effective in men with larger prostates (greater than 40 g). The medication must be used continuously, otherwise the prostate will regrow. The PSA level generally halves over a 12-month period. There is early evidence that finasteride used long term in patients with large prostates may protect against retention. It is currently not on the free list.

Anticholinergic medication

When most urinary symptoms are due to bladder instability (irritative symptoms) and not obstruction, anticholinergic medication, such as propantheline (Pro-Banthine), oxybutinin (Ditropan) and tricyclic antidepressants such as imipramine (Melipramine, Tofranil) or amitriptyline (Endep, Tryptanol, Tryptine), may have a role. Care must be taken to avoid using these in patients with obstructive symptoms.

Surgical options

In general terms, surgery should be considered in men who are severely bothered by their symptoms or have complications of BPH (retention, recurrent urinary tract infections, high residual, bladder stones or renal failure). Other candidiates are men who are moderately bothered by their symptoms who have not responded to pharmacological agents, or men who wish treatment but do not like drug therapy.

TURP, TUIP or open prostatectomy

Transurethral resection of the prostate. This, known as TURP, is the gold standard of treatment. It has the highest success rate in decreasing prostate symptom score and improving flow rates. Best results are with men who have more severe symptoms. There is usually a four-week period of restricted activity. It is least successful where people have a predominance of urgency, urge incontinence and nocturia.

Retrograde ejaculation usually follows TURP. The true incidence of impotence is unknown, but it is believed to be low if one excludes people who have erection problems preoperatively and patients who develop psychogenic erection problems. A summary of the side effects of TURP is given in Table 6.

Transurethral incision of the prostate. This, known as TUIP or bladder neck incision (BNI), is better suited to the smaller prostate and has the advantages of much less risk of retrograde ejaculation, fewer side effects and shorter hospitalisation. It cannot be used when there is a large middle lobe.

Open prostatectomy. This is rarely used these days, but it still has a role in massively enlarged prostates, especially when there are bladder complications such as stones.

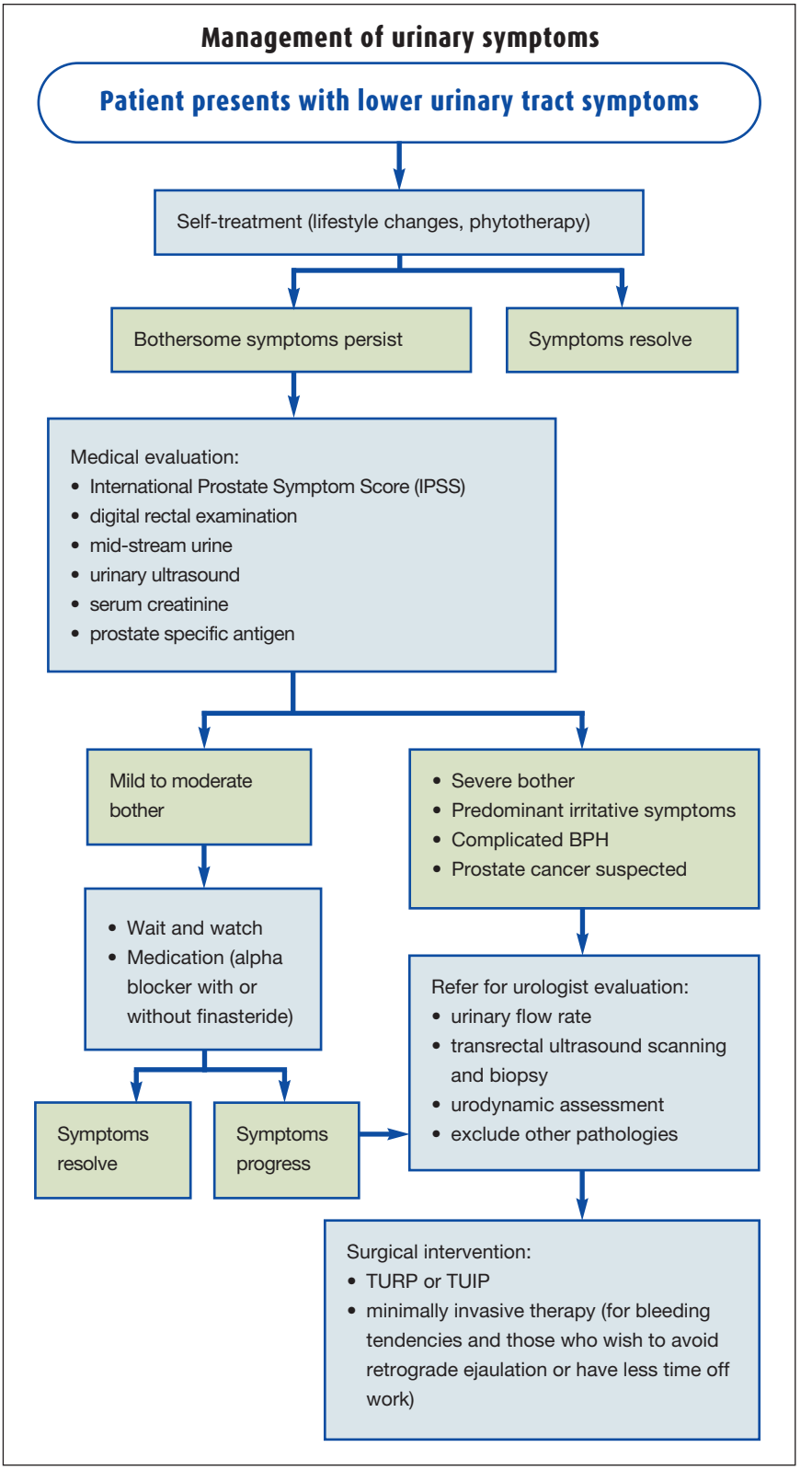
Alternative surgical treatments

In the last five years there has been a dramatic increase in new modalities for treating BPH. Most are still regarded as experimental because of lack of long term follow up and proper studies. Some, however, such as holmium laser resection of the prostate, transurethral microwave treatment, transurethral electrovaporisation and transurethral needle ablation have become genuine alternatives to TURP, although long term information is still lacking.

Holmium laser resection of the prostate. This technique uses the holmium laser to achieve the same cavity as a TURP in a relatively bloodless manner. Its advantage is in decreased catheter time, reduced bleeding, decreased hospitalisation, sustained effects, and patients' ability to go back to unrestricted activities sooner than following TURP. Its disadvantages are the difficulty in learning the technique, the cost of the initial capital outlay, and the continued development of equipment. It is recommended in those who have a bleeding tendency, but it may challenge TURP as the gold standard if results are proven to be durable.

Transurethral microwave treatment. Transurethral microwave treatment (TUMT) involves microwave radiant heating of the prostate with water conductive cooling of the urethra without the need for anaesthesia. A disposable transurethral catheter that contains a microwave antenna is used. Two versions are available: low energy (LE-TUMT) and high energy (HE-TUMT).

The low energy version is an outpatient anaesthetic-free treatment with no



blood loss and little short or long term morbidity. It is safe and gives good symptomatic improvement, but is much less effective than TURP in improving flow rate. There is minimal sexual dysfunction and no retrograde ejaculation. It is useful for patients who have mild to moderate lower urinary tract symptoms and have minimal bladder outlet obstruction who wish to avoid retrograde ejaculation.

The high energy version generates much more energy and is more effective in treating obstruction as well as symptoms. It appears slightly less effective than TURP and still needs some degree of anaesthesia. Patients complain of irritative symptoms for two to four weeks, and one-third develop retention, one-third develop retrograde ejaculation and 10 to 30% require surgical revision at three years. Blood loss does not occur. It is useful for high risk patients, patients with bleeding tendencies and patients wishing to minimise retrograde ejaculation when significant obstruction is still present.

Transurethral needle ablation. There are very limited data on transurethral needle ablation (TUNA). It involves the transmission of low frequency radiowaves through needles placed directly into the prostate. Although it has the advantage of improving symptoms in patients who are minimally obstructed who desire to preserve retrograde ejaculation, it is currently plagued by: a high (20 to 40%) need for further treatment at two years, the need for some form of anaesthesia, the exclusion of certain types of prostate enlargement, and the likelihood of prolonged catheterisation. It is currently unknown whether these results are durable, but they certainly are repeatable. The equipment is still evolving.

A suitable patient is one who has mild to moderate lower urinary tract symptoms without high grade obstruction who wishes to avoid retrograde ejaculation and impotence.

Transurethral electrovaporisation of the prostate. TUVP uses a 'Vaportrobe', which is a grooved roller-ball electrode. A diathermy machine transmits heat to the Vaportrobe which is used to groove a cavity in the prostate. The superficial cells are vaporised and there is zone of desiccation below this, leading to a theoretical advantage of less blood loss.

The procedure achieves a cavity similar to that obtained by TURP. Clinical results appear encouraging, although no long term data are available. There have been similar improvements in flow rate and symptom score as compared with TURP. The advantages of this technique are a relative decrease in intraoperative and postoperative bleeding. Therefore, catheterisation time, length of hospitalisation and loss of work days are significantly reduced. Long term results of prospective randomised trials between TUVP and TURP are in progress. At present, this seems to be a promising technique with comparable efficacy, reduced morbidity and possible reduction in health care costs. Limitations of the technique are the duration of time required to vaporise very large prostate glands and concerns about the high levels of electricity required.

Visual laser ablation of the prostate. In this technique, a neodymium-YAG laser beam is fired directly onto the prostate tissue. Results at six months after this technique are promising in terms of improvement in symptom score and flow rate. There is a reduced incidence of blood loss compared with TURP. The major drawback of this technique is a long postoperative cath - eterisation time with significant post-treatment dysuria. Long term results are not as good as with TURP, with higher re-operation rates.

Interstitial laser coagulation of the prostate. This involves inserting a laser fibre directly into the prostate. Neodymium-YAG laser energy is then transformed into heat, resulting in thermal damage within the prostate. Initial swelling of the prostate occurs, with subsequent regression of the prostatic lobes resulting in resolution of bladder outflow obstruction. Vast improvements occur in symptoms and peak flow rate. Long term data are now available for up to three years. Interstitial laser therapy has the advantages of reduced morbidity with decreased blood loss. However, major disadvantages are prolonged postoperative catheterisation and marked irritative symptoms. All laser treatments involve considerable expense in the initial capital costs.

High intensity focused ultrasound. This involves inserting a probe into the rectum and using high intensity focused ultrasound to cause tissue ablation within the prostate. Few studies have looked at this technique and long term data are still awaited. There are significant cost limitations.

Balloon dilatation. This has not gained general acceptance among urologists. The long term outcome is poor and a general anaesthetic is required.

Conclusion

The treatment for patients with lower urinary tract symptoms must be tailored according to the degree of bother, the severity of urinary symptoms, the wishes of the patient, and a full discussion of each option. A variety of treatments are now available for patients with bladder outflow obstruction and lower urinary tract symptoms. Some of these new technologies approach TURP in terms of efficacy and they possibly have reduced side effects. However, long term data are still awaited on these technologies. MT