

Assessing and managing benign prostatic hyperplasia

Benign prostatic hyperplasia (BPH) is an extremely common condition occurring in middle-aged and older men. Treatment is generally indicated in patients who have significant lower urinary tract symptoms or complications related to the BPH.

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Benign prostatic hyperplasia (BPH) refers to the noncancerous enlargement of the prostate gland that occurs in men from middle age onwards. All men will develop BPH as they grow older; however, the degree of enlargement and severity of symptoms varies greatly. Although the aetiology of BPH is not fully understood, heredity, increasing age and the presence of testosterone all appear to play a part.

As a result of the ageing population, BPH is becoming increasingly prevalent, but only 20 to 30% of affected patients will require surgical intervention for their symptoms. Although rarely life threatening, BPH can have a significant impact on quality of life and morbidity. Accordingly, all patients with symptomatic BPH should be assessed; a detailed clinical history, focused physical examination and appropriate pathology

and radiological imaging are needed to determine the most suitable course of management.

What are the symptoms and complications of BPH?

There are no pathognomonic symptoms of BPH. Most patients present with a mixture of lower urinary tract symptoms (LUTS), although obstructive LUTS predominate in those with uncomplicated BPH (see the box on page 14 and Table 1).

Complications of BPH are encountered much less often than voiding symptoms. These include recurrent urinary tract infections, macroscopic haematuria, bladder stones, acute urinary retention and, in severe cases of bladder outlet obstruction, renal impairment, which is termed 'obstructive uropathy'.

IN SUMMARY

- The aetiology of benign prostatic hypertrophy (BPH) is not yet known, but heredity, increasing age and the presence of testosterone appear to play a part.
- Most patients with BPH present with a mixture of lower urinary tract symptoms.
- The most useful initial investigation for patients with BPH is an ultrasound of the urinary tract, with determination of postvoid residual bladder volume.
- Observation is appropriate for patients with mild to moderate symptoms but no complications related to the BPH.
- Patients with mild to moderate symptoms that significantly impact on their quality of life are candidates for medical therapy, usually with an alpha blocker or finasteride.
- Surgical treatment is reserved for patients with more severe symptoms or who fail initial medical therapy; transurethral resection of the prostate is considered the gold standard of treatment of symptomatic BPH.

Table 1. Lower urinary tract symptoms (LUTS)

Obstructive symptoms

Hesitancy
Weak urinary stream
Intermittency
Straining to void
Sensation of incomplete bladder emptying

Irritative symptoms

Urgency
Urge incontinence
Frequency
Nocturia

How should patients be evaluated initially?

History

A careful history is critical in the assessment and management of patients with BPH. Initially, patients should be questioned on the voiding symptoms that they have, and some attempt made to determine the severity of these symptoms and the extent to which they are impacting on the patient's quality of life.

A symptom questionnaire such as the International Prostate Symptom Score (IPSS; see the box on page 15) can be useful in providing a more objective measure of symptom severity. The IPSS also addresses how bothersome the symptoms are to the individual, which should be the most important factor in deciding whether a patient with uncomplicated BPH requires treatment.

Several medical conditions, such as diabetes mellitus, congestive heart failure, Parkinson's disease and sleep apnoea, can cause LUTS or exacerbate the symptoms of BPH. Similarly, a number of medications, such as antidepressants, antihistamines and, possibly, bronchodilators, can exacerbate BPH symptoms. Another important factor to consider when evaluating patients with BPH and LUTS is whether there is a history of any previous procedures to the urinary tract, including urethral catheterisation.

Conditions that should be considered in the differential diagnoses of BPH and LUTS are listed in Table 2.

Benign prostatic hyperplasia

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All patients with symptomatic benign prostatic hyperplasia should be assessed to determine the most suitable course of management. Treatment options comprise observation, medical therapy, minimally invasive treatment and surgery. Although transurethral resection of the prostate is still considered the gold standard of treatment in symptomatic patients, newer and less invasive modalities such as green light laser vaporisation of the prostate gland are showing promise.

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Physical examination

The physical examination of patients with BPH should comprise:

- evaluation of the bladder to look for a palpable bladder, indicating chronic retention
- a rectal examination to evaluate prostate size and consistency
- evaluation of the external genitalia.

Laboratory investigations

Laboratory investigations should include urinalysis or urine microscopy and measurement of

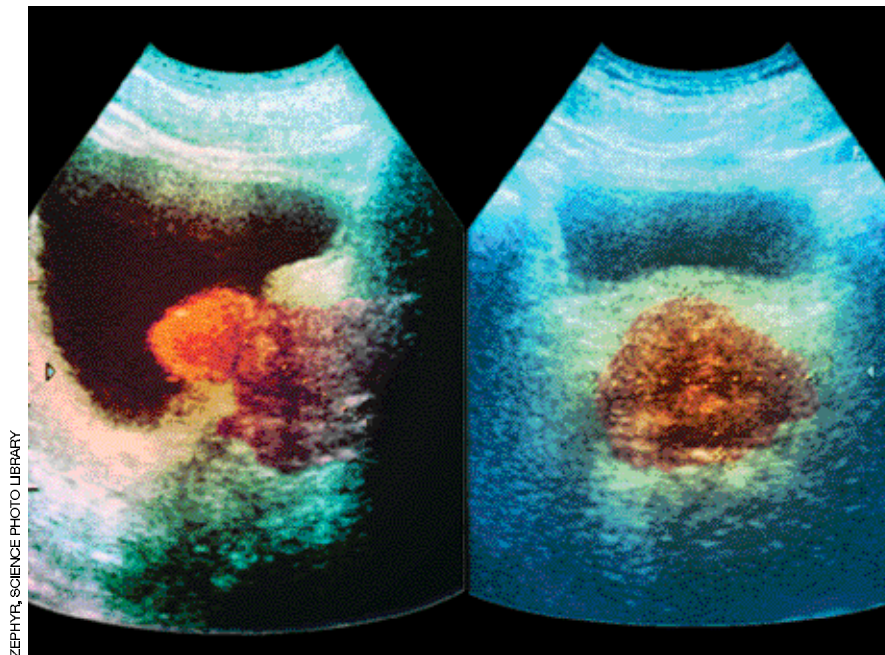


Figure. Pelvic ultrasound showing enlarged prostate and small postvoid residual.

Terminology

Lower urinary tract symptoms (LUTS)

'Lower urinary tract symptoms' is a general descriptive term for several symptoms arising from the lower urinary tract (see Table 1). These symptoms are not specifically related to benign prostatic hyperplasia (BPH) but can occur in several conditions affecting the urinary tract in both men and women. Although nonspecific, these parameters are used to assess the severity of symptoms in patients with BPH, and are also a useful endpoint in determining the benefits of the various BPH treatments. The older term 'prostatism' can be a misleading label for many older men who have LUTS that are not due to BPH and, therefore, is not recommended terminology.

Bladder outlet obstruction

Bladder outlet obstruction is the physical obstruction in the prostatic urethra caused by an enlarged prostate gland. Many patients with BPH and/or bladder outlet obstruction may be asymptomatic.

Prostate cancer

Prostate cancer is a malignant condition that will affect 10% of men during their lifetime. Early prostate cancer is very rarely associated with LUTS and usually asymptomatic. BPH is not a predisposing factor for prostate cancer.

Prostatitis

Prostatitis is an inflammatory condition of the prostate gland. It can occur in men without significant BPH and can often mimic the symptoms of prostatic enlargement.

serum creatinine level. The prostate specific antigen (PSA) test is considered to be an optional investigation in the assessment of men with LUTS. However, it is the authors' recommendation that this test be performed, after obtaining informed consent, in men under the age of 70 years, since a diagnosis of prostate cancer could alter the choice of treatment in those with symptomatic BPH. In addition, an elevated PSA due to BPH increases the risk of subsequent retention.

Radiological investigations

The most useful initial investigation for patients with BPH is an ultrasound of the urinary tract, with determination of a postvoid residual bladder volume (Figure). An elevated postvoid residual of greater than 50 mL is more suggestive of bladder outflow obstruction such as BPH. In addition, imaging may detect other causes of LUTS, such as bladder tumours or urinary tract calculi.

Additional investigations

Additional investigations include urine cytology, measurement of urine flow rates, a urodynamic study, cystoscopy, intravenous pyelogram and transrectal ultrasound. One or more of these tests may be indicated in patients who have unusual voiding symptoms (such as marked irritative voiding or incontinence), pre-existing neurological conditions, or had surgery on their lower urinary tract. Generally, such men should be referred to a urologist who can arrange these investigations. Furthermore, if any other urinary tract pathology is detected on initial evaluation, additional investigations or urological referral is often required.

What is the natural history of this condition?

Between 5 and 10% of patients progress to surgery within four years of having significant urinary symptoms. The predictors of the need for surgery or developing retention are listed in Table 3.

International Prostate Symptom Score (IPSS)

Doctor's name Address

Patient's name

Date

Age group ☐ 40 to 49 years ☐ 50 to 59 years ☐ 60 to 69 years ☐ 70+ years

	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 again 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 or more times 5	

Which of the above symptoms do you regard as most troublesome (1-7)?

Total prostate symptom score

	Delighted	Pleased	Mostly satisfied	Mixed – satisfied and dissatisfied	Mostly dissatisfied	Unhappy	Terrible
Quality of life due to urinary symptoms If you were to spend the rest of your life with the urinary condition just the way it is now, how would you feel about that?	0	1	2	3	4	5	6

Total score: 0 to 7 mild symptoms; 8 to 18 moderate symptoms; 19 to 35 severe symptoms.

Table 2. Differential diagnoses of BPH and LUTS**Neurological conditions**

Parkinson's disease
Cerebrovascular accident
Alzheimer's disease
Multiple sclerosis

Inflammatory conditions

Urinary tract infections
Prostatitis

Other conditions

Carcinoma in situ (CIS) of the bladder
Distal ureteric stones
Urethral stricture
Severe phimosis

What is the role of PSA in the assessment of BPH?

As mentioned above, a PSA test is recommended in the assessment of some men with symptomatic BPH. PSA levels are known to be increased in men with significant BPH; however, an elevated PSA level should not initially be attributed to benign enlargement of the prostate gland. It has been noted recently that an elevated PSA level in the absence of prostate cancer is predictive of further progression of urinary symptoms.

Can I manage my patient who has BPH?

Patients with mild or moderate symptoms from BPH and in whom the initial evaluation has not shown any other significant pathology can be managed by their GP without referral to a urologist. Nonsurgical management, as discussed below, can be instituted and monitored by the GP, with specialist referral reserved for those patients who do not benefit from initial treatment and are still significantly troubled by their symptoms.

Patients with any complications related to their BPH should always be referred to a urologist.

What are the treatment options for BPH?**Observation**

Observation should be considered for patients with mild to moderate symptoms but no complications related to their BPH. This form of management is ideal for those who are minimally bothered by their voiding symptoms and who wish to avoid taking medications in the long term.

Patients under observation should have their symptoms reviewed by the GP six- to 12-monthly, along with a yearly urinary tract ultrasound and a yearly PSA test. They should also be counselled on appropriate lifestyle changes that may help to minimise their symptoms. These include avoiding the intake of excessive amounts of alcohol and caffeine-containing drinks, constipation and cold environments. Most men managed in this way will be able to avoid any further treatment for at least five years from their initial assessment.

Medical therapy

Patients who are most suited to medical therapy are those who are experiencing mild to moderate symptoms from their BPH and who report a significant impact on their quality of life due to their symptoms. In addition to the lifestyle changes mentioned above, an oral medication may provide symptomatic relief of voiding problems. Oral medications for BPH symptoms comprise conventional medications – namely, alpha blockers or finasteride (Proscar) – and phytotherapy, or herbal preparations, which are purported to be of some benefit.

Alpha blockers

Most patients who are receiving conventional medication for prostatic symptoms are treated with alpha blockers. These medications give symptomatic relief in obstructive BPH by acting on α_1 -adrenoceptors in prostatic smooth muscle and the bladder neck. This action results in a reduction of outflow obstruction, and between 50 and 70% of people taking

Table 3. Factors predicting the need for surgery for BPH

Peak flow rate (less than 15 mL/sec)
Prostate size (greater than 40 cm³)
Increasing patient age
International prostate symptoms score (greater than 10)
PSA level above age specific range
Deterioration in symptoms over time
Previous retention
Lack of response to alpha blocker

these medications will experience some symptomatic relief as evaluated by their IPSS. Therapeutic benefit from these drugs should be experienced within a few days of initiating treatment and is only derived while the patient stays on the medication.

Drugs in this category include:

- prazosin (Minipress, Pressin)
- terazosin (Hytrin)
- tamsulosin (Flomax).

The possible side effects of these medications include hypotension and related dizziness, headache and retrograde ejaculation. Symptoms related to hypotension tend to be much more common with prazosin than other alpha blockers because it is not selective for the α_1 -receptors in the prostate gland. Recently, a new rare side effect – intraoperative floppy iris syndrome – has been reported in patients taking tamsulosin and having cataract surgery. It is therefore recommended that tamsulosin is discontinued at least two weeks before patients undergo cataract surgery.

Alpha blockers tend to be most effective in patients who have mild to moderate enlargement of their prostate gland.

Finasteride

Finasteride works by blocking the intraprostatic conversion of testosterone to its more active metabolite, dihydrotestosterone (DHT). This results in a reduction

in prostate size of about 20 to 30%, which can reduce outflow obstruction. It may take three to six months of treatment to see the maximal benefit from this medication, and prostatic size will increase again if the medication is ceased. Common side effects may include diminished libido, erectile dysfunction, gynaecomastia and decreased volume of ejaculate.

Finasteride is most effective for patients with significantly enlarged prostate glands, and it has the effect of halving pretreatment serum PSA levels. This fact should be taken into account when screening patients for prostate cancer risk.

There is evidence to suggest that finasteride is of benefit in reducing the incidence of acute urinary retention in patients with significant bladder outflow obstruction due to BPH. A recent US study found that long term finasteride treatment decreased the overall risk of developing prostate cancer, although more aggressive tumours did not decrease and may even have increased (further study has suggested that this is not a real increase). Individuals should be counselled in relation to this information before starting treatment.

Recent studies also suggest that there may be increased efficacy if an alpha blocker is taken in conjunction with finasteride, although the significant cost of such ongoing treatment as well as the cumulative risk of side effects must also be considered.

Phytotherapy

At least 40 different natural or herbal extracts have been proposed to be of benefit in treating the symptoms of BPH. The most commonly used preparations contain an extract from the plant *Serenoa repens* (saw palmetto). A number of patients have reported some symptomatic relief with this form of treatment, although there is little scientific evidence to support this observation. However, as side effects are minimal and this preparation is much cheaper than conventional

medications for BPH, it is a reasonable option for many patients with mild to moderate symptoms.

Surgical management

Indications for surgical intervention in the management of BPH include failure of medical treatment, severe LUTS or one of the complications related to BPH.

Transurethral resection of the prostate

Transurethral resection of the prostate (TURP) is still considered to be the 'gold standard' of treatment for symptomatic BPH. In this procedure, a resectoscope is inserted into the urethra and prostatic tissue shaved away using an electrical loop. About 80 to 90% of patients who undergo this operation will experience significant and sustained improvement in their voiding symptoms.

The main side effect of this treatment is permanent retrograde ejaculation, which occurs in at least 70% of patients. The incidence of *de novo* erectile dysfunction is very low (2 to 4%) and urinary incontinence is rare (<1%).

The procedure is usually performed under spinal anaesthesia, with the patient staying in hospital for two to three days and limiting physical activity

for three to four weeks. The likelihood of patients requiring further TURP at 10 years is about 20%.

Transurethral incision of the prostate

Transurethral incision of the prostate (TUIP) (also known as bladder neck incision; BNI) is another way of relieving prostatic obstruction. In this procedure, no tissue is resected from the prostate, but one or two longitudinal incisions are made in the prostate gland to widen the bladder outlet. This operation is reserved for patients with mild prostatic enlargement or younger patients. The incidence of retrograde ejaculation postoperatively is significantly lower than that with TURP, in the order of 10 to 20%.

Open prostatectomy

Open prostatectomy involves enucleation of the glandular tissue in the prostate through a suprapubic abdominal incision. It should not be confused with radical prostatectomy, which is performed for prostate cancer. Open prostatectomy is not often performed nowadays but is occasionally indicated in patients who have massively enlarged prostate glands or who have very large bladder stones or bladder diverticula that may require concomitant treatment.

Less invasive surgical treatments

Although TURP is the main surgical procedure performed for BPH, several other modalities have been used to treat prostatic enlargement and decrease the morbidity and recovery time associated with conventional therapy.

One approach has been to use microwaves or radiowaves to heat prostatic tissue to a point where coagulative necrosis occurs in the gland with subsequent shrinkage of the prostate as it heals. The benefits of such treatment include short hospital stay, minimal blood loss, decreased incidence of retrograde ejaculation and earlier return to normal activity for patients. The disadvantages include a

high rate of temporary urinary retention post-treatment, as well as a lesser improvement in voiding symptoms compared with TURP. The retreatment rate for patients having these forms of therapy is also higher, and they are not often performed in Australia.

A number of intraprostatic stents have been trialled in patients with bladder outflow obstruction due to BPH. These stents may be made from polyurethane or metal alloy and can be inserted on a temporary or permanent basis to physically separate the lateral lobes of the prostate gland and facilitate voiding. Permanent stents use a mesh configuration to allow them to be incorporated into the prostatic urethra. In the authors' experience, these devices tend to be very problematic and are associated with numerous complications such as haematuria, irritative voiding symptoms, stent migration and failure to void. Their use should be restricted for men who have severe obstruction and in whom any other form of surgical treatment is not possible.

Laser treatment

A number of different laser devices have been used to treat BPH, with varying success. Generally, laser treatment falls into two main categories:

- techniques that destroy prostatic tissue by vaporisation or coagulation
- techniques that use a laser to resect prostatic tissue.

Laser resection of the prostate gland

Laser resection of the prostate gland is performed with a holmium laser beam. In this procedure, prostatic tissue is cut away using the laser beam to create a cavity in the prostate gland much in the same way that conventional TURP achieves clearance.

The improvement in voiding symptoms with this technique has been shown to be the same as that with TURP. However, the benefits of laser resection compared with conventional resection are decreased operative blood loss and

hospital stay, as well as a shorter recovery time for patients. The disadvantages of this form of treatment are the learning curve required to perfect this technique and the high initial cost of equipment. The long term efficacy of laser resection has been confirmed by prospective, randomised clinical trials.

Laser coagulation of the prostate gland

Coagulative necrosis of the prostate gland has also been performed transurethrally with lasers. Once again, the benefits of this treatment are reduced blood loss, better operative haemostasis and a decreased incidence of retrograde ejaculation. Unfortunately, this form of treatment has also resulted in higher incidences of post-operative urinary retention, recurrence of obstruction and postoperative irritative voiding symptoms, and so is not often used nowadays.

KTP laser vaporisation of the prostate

Laser (photo) vaporisation of the prostate gland using a high-energy potassium titanyl phosphate (KTP, or green light) laser is a newer treatment showing significant promise. In this procedure, a laser fibre is inserted transurethrally and prostatic tissue is heated to the point where it vaporises, creating an instant cavity much like in TURP. The wavelength of this type of laser is highly absorbed by haemoglobin, making the procedure extremely haemostatic and, therefore, suitable for patients who are anticoagulated.

This treatment appears to be relatively easy to learn, and the short term (five-year) results show a high level of patient satisfaction. One disadvantage of this operation is that no prostatic tissue is obtained for histopathology. The long term efficacy and retreatment rate associated with this form of therapy is, as yet, unknown. Like many newer therapies, capital and ongoing costs are high at this stage, and facilities in Australia for this treatment are limited.

Indwelling catheters

Indwelling catheters (urethral or suprapubic) are considered to be temporary devices for the management of bladder outlet obstruction or acute retention secondary to BPH. They may be indicated for patients with permanent bladder drainage debilitation or those who are medically unfit.

Can BPH be prevented?

At present, because the aetiology of BPH is not clearly understood, there is no way of preventing this condition. Medications such as finasteride can alter the natural history of this disease to an extent; however, they are not recommended for use in asymptomatic men.

Conclusion

BPH is an extremely common condition affecting middle-aged and older men. Symptomatic men should undergo initial evaluation by their GPs.

Treatment of this condition is generally indicated in patients who have significant LUTS or complications related to their prostatic enlargement. The first line of treatment is medical therapy, usually with a selective α_1 -blocker.

Surgical treatment is reserved for patients with more severe symptoms or those who fail initial medical therapy. TURP is still considered the gold standard of treatment in patients with symptomatic BPH, but a number of newer, less invasive modalities have been used. Of these, the most effective to date has been holmium laser resection of the prostate gland, although KTP (green light) laser treatment shows significant promise.

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DECLARATION OF INTEREST: None.