



American
Urological
Association

Advancing Urology™

Benign Prostatic Hyperplasia Case Study 1

Medical Student Case-Based
Learning

The Case of Mr. Jones and the Urinal of Doom

Mr. Jones, a noted archeologist, presents to his primary care physician with lower urinary tract symptoms (LUTS). You are expected to direct the evaluation, education, and management of this patient.

Learning Objectives

After completing this activity, participants will be able to:

- Identify the predominant location in the prostate where BPH develops and describe how this fact relates to the symptoms and signs of BPH.
- Define BPH.
- Describe the natural history and distinctive epidemiological features of BPH.
- List the symptoms and signs of BPH.
- List the important components of the history and physical examination when evaluating a patient with BPH.
- List what laboratory, radiologic, or urodynamic tests, if any, should be ordered in a patient with BPH.
- List the indications for treatment of BPH.
- List the medical treatment options for BPH and describe their side effects and the mechanisms by which these medications work.
- List and briefly describe the surgical treatment options for BPH.
- Describe when a patient with BPH should be referred to a urologist.

Mr. Jones' Visit to his Primary Care Physician – part 1

Mr. Jones, a 78-year old male, enters his primary care physician's clinic walking with a limp and carrying a plastic urinal on his belt along with his signature whip and pistol. The doctor greets him warmly and with admiration, after all he is the discoverer of the Holy Grail. Mr. Jones states that he has been extremely bothered over the last few months with the need to urinate every half hour to hour. He is only able to continue worldly travels if he carries a plastic urinal with him at all times. "It's always there, right next to the whip." He reports that this greatly reduces the speed at which he can draw his pistol and urine spills all over him when he uses his whip. The doctor feels that Mr. Jones may be suffering from benign prostatic hyperplasia (BPH).

Mr. Jones' Visit to his Primary Care Physician – part 1

What are the symptoms of BPH that the physician should ask about?

Mr. Jones' Visit to his Primary Care Physician – part 1

- **Obstructive symptoms: Weak stream, Intermittent flow, Straining to urinate, and incomplete Emptying**
 - ❖ **(ACRONYM- WISE)**
- **Irritative symptoms: Frequency, Urgency, Nocturia**
 - ❖ **(ACRONYM- FUN)**

Lower Urinary Tract Symptoms (LUTS) are not specific for BPH. For instance, urethral strictures can cause obstructive symptoms, and bladder tumors can result in significant irritative symptoms. Of note, BPH is a common cause of hematuria. Even so, any patient with hematuria (>3-4 RBC/high-powered field) on urine microscopy in the absence of infection should be referred to a urologist for a hematuria work-up to rule out cancer.

Mr. Jones' Visit to his Primary Care Physician – part 2

The doctor mentions to Mr. Jones that he likely is suffering from benign prostatic hyperplasia (BPH), an extremely common disorder in elderly males. Mr. Jones is relieved to know that this condition is not caught from reptiles, like snakes. In fact, it can be detected histologically in 70% of men aged 70 and 90% of men aged 90.(1) He explains that progression of this microscopic hyperplasia can result in enlargement of the prostate. It is estimated that one in four (25%) man will have significant urinary symptoms from BPH in their lifetime.

Mr. Jones' Visit to his Primary Care Physician – part 2

Where in the prostate does BPH occur?

Mr. Jones' Visit to his Primary Care Physician – part 2

BPH develops in the transition zone of the prostate which surrounds the urethra, unlike prostate cancer which tends to develop at the periphery of the gland. As you know, the urethra travels through the prostate, and it is this enlargement of the prostate near the urethral lumen that results in urinary symptoms. A digital rectal examination is an effective screen for prostate cancer because the majority of prostate cancer develops at the periphery of the gland near the rectal wall where it can be palpated. This is not the case with BPH since it is the growth of tissue near the urethra which results in urinary symptoms. While many men with BPH may have very large prostates, digital rectal examination is not a very accurate means by which to assess the severity of urethral obstruction.

References: Walsh et al. 2002. Campbell's Urology (8th ed). New York: Elsevier Science.

Mr. Jones' Visit to his Primary Care Physician – part 3

The doctor asks Mr. Jones further questions to learn more about his urinary status and to rule out other causes of his urinary symptoms:

- does anything (including over-the-counter medications) make his urinary symptoms better or worse?
- has he ever had an episode of urinary retention?
- does he have any dysuria or history of urinary tract infections?
- does he have diabetes or other neurologic disorders which can result in bladder dysfunction?
- does he have any history of urethral strictures or sexually-transmitted diseases?
- has he ever had any previous endoscopy or surgery of the urinary tract?

After mentioning that he had fewer questions when kidnapped by desert nomads, Mr. Jones responded that his past medical history is notable only for snake bites, gunshot wounds, scalp lacerations from broken bottles and several concussions. He is currently taking no medications.

Mr. Jones' Visit to his Primary Care Physician – part 3

On physical examination, Mr. Jones has no costovertebral angle tenderness and his bladder does not feel distended on palpation or percussion. His genital exam is normal. Digital rectal examination reveals a prostate which is 4cm in breadth, smooth, and non-tender with no nodules. On neurologic exam, Mr. Jones anal sphincter tone and perineal sensation is normal, and his sacral reflexes (knee and ankle jerks) are intact.

At this point, what further evaluation(s) should be performed by the primary care physician on Mr. Jones to work-up his likely BPH?

Mr. Jones' Visit to his Primary Care Physician – part 3

- A. The International Prostate Symptom Score (IPSS), is the American Urological Association-Symptom Index (AUA-SI), inclusive of a quality-of-life score as well. It is a short, validated questionnaire which can document the baseline severity of lower urinary tract symptoms and can be used to monitor the impact of therapy.
- B. It is recommended that a urinalysis be performed to rule out infection and assess for hematuria.
- C. A voiding diary (recording by the patient of the volume and timing of oral fluid intake and urination) may be very helpful in ruling out other causes of lower urinary tract symptoms. For instance, an excessive volume of urine produced at night may indicate that the patient has congestive heart failure and is mobilizing peripheral fluid while sleeping supine. It may also tell you if frequency or nocturia is due to excessive oral fluid intake.
- D. The measurement of serum creatinine level although useful to rule-out renal insufficiency due to obstructive uropathy, is not a good first-line screening test.

Mr. Jones' Visit to his Primary Care Physician – part 3

Primary care physicians rarely have the equipment to perform many of the tests below such as uroflowmetry, postvoid residual (PVR) measurement by ultrasound, or urodynamics. These analyses can be quite helpful, primary care physicians are not expected to perform them.

Uroflowmetry (measurement of urine flow rate) can be a very helpful means to assess the severity of BPH. A low flow rate (<10 cc/sec) is not very specific, though, since it could be caused by urethral obstruction (BPH, stricture, etc.) or by poor bladder contractility.

If the doctor is concerned about incomplete emptying or urinary retention, placement of a urinary catheter upon completion of voiding and measuring a low PVR of <50cc can help rule this out as a problem. This measurement can also be performed by a transabdominal ultrasound. Unfortunately, PVR is unreliable due to a large amount of variability within individuals.

Mr. Jones' Visit to his Primary Care Physician – part 3

Urodynamic testing (cystometry, pressure-flow analysis) is performed by urologists. It can be very helpful in determining the capacity, compliance and contractility of the bladder as well as assessing the degree of obstruction. This test is usually reserved for those patients who have failed medical therapy for BPH, are considering surgical therapy for BPH, or have a potential neurologic etiology of their urinary symptoms (spinal cord injury, prolapsed lumbar disk, etc.)

References: Walsh et al. 2002. Campbell's Urology (8th ed). New York: Elsevier Science.

Mr. Jones' Visit to his Primary Care Physician – part 4

Mr. Jones completes an International Prostate Symptom Score (IPSS) questionnaire which documents his moderate-to-severe urinary symptoms. As he hands the questionnaire to the doctor, he says, “Doc, I don’t know if this is important, but a few weeks back I got the sniffles after hanging out with a scrappy, snot- nosed kid. So I took a decongestant pill, and boy, I had one heck of a time peeing!”

Why would Mr. Jones have more trouble passing urine?

Mr. Jones' Visit to his Primary Care Physician – part 4

The prostate has a significant amount of smooth muscle innervated by alpha adrenergic nerves. Stimulation of those nerves causes the prostate to contract around the urethra leading to an exacerbation of obstructive symptoms. Taking Sudafed (pseudoephedrine) can put a man suffering from prostatic enlargement into complete urinary retention.

Mr. Jones' urinalysis shows no evidence of infection or hematuria, and his post-void residual urine is low (15cc).

Mr. Jones' Visit to his Primary Care Physician – part 4

What is the most appropriate next step in Mr. Jones' management?

Mr. Jones' Visit to his Primary Care Physician – part 4

The first-line medical therapy for BPH is an alpha-blocker such as terazosin (Hytrin), doxazosin (Cardura) and tamsulosin (Flomax). Alpha-blockers act by relaxing the prostatic smooth muscle and thus facilitating the opening of the prostatic urethra.

Finasteride (Proscar) is a 5-alpha reductase inhibitor which acts by blocking the formation of dihydrotestosterone and results in the shrinking of the volume of the prostate. These results may take up to 6 months of therapy to achieve. Recent data suggest that finasteride can reduce the rate of urinary retention in long-term users of the medication, but it is usually not considered a first-line therapy for BPH and it works best with significantly enlarged prostates.

Mr. Jones does not need a urodynamic evaluation at this time, since he does not have any underlying neurologic abnormality, has not failed medical therapy, and is not considering surgical treatment.

Mr. Jones' Visit to his Primary Care Physician – part 4

Mr. Jones does not need a urodynamic evaluation at this time, since he does not have any underlying neurologic abnormality, has not failed medical therapy, and is not considering surgical treatment.

Surgical therapy for BPH is definitely an option, but medical therapy is generally tried first. Indications for surgery for BPH include failure of medical therapy, patient's desire to avoid medications, recurrent urinary retention, and obstructive uropathy or bladder stones from bladder outlet obstruction.

References: Walsh et al. 2002. Campbell's Urology (8th ed). New York: Elsevier Science

Mr. Jones' Visit to his Primary Care Physician – part 5

The doctor decides to start Mr. Jones on the alpha-blocker terazosin (Hytrin). He plans to start him at 2mg PO QHS, and over the next few weeks, will slowly increase the dose up to 8-10mg PO QHS. Mr. Jones then asks “Are you sure there are no poisons in this pill?”

What is the most common side effect of alpha-blocker therapy for BPH and the side effect about which Mr. Jones should be counseled to stop the medication or reduce the dose?

Mr. Jones' Visit to his Primary Care Physician – part 5

Dizziness is the most common side effect of alpha-blocker therapy. Mr. Jones should be counseled that, if this were to occur, he should stop the medication or reduce the dose. Headache has been reported as a side effect in some alpha-blocker trials. Other potential side effects include fatigue and nausea.

Mr. Jones' Referral to a Urologist

Over the next few weeks, Mr. Jones titrates his medication up to 10mg PO QHS with minimal improvement of his urinary symptoms. During a car chase, he became drenched in urine as his plastic urinal tipped over as he was rounding a corner. His primary care physician refers him to a urologist for further evaluation and treatment of his symptoms.

The urologist repeats a thorough history and physical examination and agrees with the findings of the primary care physician. Since Dr. Jones' symptoms did not improve much with alpha-blocker therapy, the urologist performs a urodynamic evaluation which confirms that his symptoms are due to obstruction from the prostate and not from neurologic problems or a poorly-contracting bladder.

Which would potentially be an appropriate procedure for Mr. Jones?

- A. Transurethral resection of the prostate (TURP) is the traditional gold-standard therapy to relieve prostatic obstruction from BPH.
- B. Transurethral microwave thermotherapy (TUMT) uses microwaves to heat and destroy excess prostate tissue. This therapy is less effective than a TURP, but it may be appropriate for patients with cardiac risk factors or other co-morbidities which would increase the risk of a TURP.
- C. Holmium laser enucleation of the prostate (HoLEP) or thulium laser enucleation of the prostate (ThuLEP) is a minimally invasive technique that can be offered to patients with larger prostate glands. It can be used for virtually any size prostate including very large glands.
- D. Transurethral radiofrequency needle ablation of the prostate (TUNA) for BPH delivers low-level radiofrequency energy through twin needles to burn away selected regions of the enlarged prostate. Shields protect the urethra from heat damage. AUA Guidelines no longer recommend this therapy for the treatment of LUTS attributed to BPH.
- E. Radical prostatectomy would not be indicated since this operation is done for prostate cancer.

Mr. Jones Undergoes a TURP

The Urologist discussed the therapy options in detail with Mr. Jones. He refuses to undergo transurethral microwave thermotherapy (TUMT) because it reminds him of a torture technique used on him forty years ago. He does, though, decide to undergo a TURP.

After obtaining ‘cardiac and medical clearance,’ the TURP procedure was performed without any difficulties. Following removal of the catheter, his lower urinary tract symptoms improve dramatically.

Now Dr. Jones can ride off into the sunset...without his plastic urinal on his belt and the tipped Fedora hat on his head.

Take-Home Messages from ‘The Case of Mr. Jones and the Urinal of Doom’

1. BPH usually presents with ‘lower urinary tract symptoms’ which can be obstructive (WISE) and/or irritative (FUN) in nature. These symptoms are not specific to BPH.
2. BPH is a common cause of hematuria. Even so, hematuria still mandates a referral to a urologist for a work-up to rule out cancer.
3. BPH develops in the transition zone of the prostate surrounding (and potentially obstructing) the urethra.
4. The initial evaluation of BPH should include a medical history, physical exam, completion of a validated questionnaire (AUA-SI, IPSS), and a urinalysis.

Take-Home Messages – Continued

5. First-line medical therapy for BPH is an alpha-blocker which relaxes the prostatic smooth muscle. Dizziness is the most common side effect and may require discontinuation of the medication or reduction in its dose.
6. Finasteride (Proscar) is a 5-alpha reductase inhibitor which can reduce BPH-related symptoms by reducing the volume of the prostate.
7. Tadalafil (Cialis) is a Phosphodiesterase-5-inhibitor which can also be considered for BPH.
8. Patients with BPH should be referred to a urologist if they fail medical therapy, have a potential neurologic cause of their symptoms, or are considering surgical therapy.
9. Transurethral resection of the prostate (TURP) is a procedure for the treatment of BPH.