

SIGNIFICANCE OF SYMPTOMS AND URODYNAMICS IN OUTFLOW TRACT OBSTRUCTION*

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Prostatism is a widely used expression that refers to problems of micturition that occur in older men. It is, however, a term that is liable to mislead since the prostate may not always be the source of the problem. Abnormalities of the urethra, external meatus and the bladder neck also cause similar symptoms and it is important that these should be recognized. This paper only refers to the bladder neck and prostate; other conditions affecting the urethra are excluded. These two conditions may co-exist but here they will be considered separately.

Bladder Neck Obstruction (BNO)

The diagnosis of BNO is often made by a process of exclusion. Thus it is necessary to consider infective causes such as prostatitis or schistosomiasis that lead to fibrosis of the neck of the bladder and neurological problems that occur with diabetes or an intervertebral disc protrusion. If these can be excluded then the obstruction may be due to a failure of the bladder mechanism to open when the detrusor contracts — dyssynergia. There are varying degrees of this abnormality and it appears to be a condition that can be relatively unchanged over many years¹.

The characteristic features of these patients are a slow stream which they have had for many years (sometimes described as a "non-competitive stream") and their relatively young age (usually under 50 years). Frequency, urgency and some post-micturition dribble may occur. Examination of the patient is unremarkable, and these patients have no residual urine until late in their history. Sometimes these patients develop retention of urine after a simple operative procedure, and this should not be attributed to an enlarged prostate without further investigation. The term bladder neck dyssynergia is not a pathological diagnosis and is primarily a muscular dysfunction rather than a fibrotic change at the bladder neck.

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A poor urinary flow rate and proximal urethral obstruction on a micturating cystourethrogram are the most consistent findings. The value of other urodynamic measurements is more debatable and, in particular, the urethral pressure profile is liable to wrong interpretation.

The management of BNO due to fibrosis is endoscopic bladder neck incision. The diagnosis of bladder neck dyssynergia can be confirmed by a test dose of an alphablocking agent (e.g. phenoxybenzamine). Whether or not the dyssynergia is managed by alpha blockade or bladder neck incision would depend on the severity of the symptoms : it should be remembered that an incision of the bladder neck can result in retrograde ejaculation

Benign Prostatic Hypertrophy (BPH)

The pathological changes that occur in the prostate begin in men between the ages of 40 and 50 years. Over the following decades, nodular hyperplasia in the peri-urethral part of the prostate leads to the development of adenomata. In gross anatomical terms the adenomata form lateral masses with a variable enlargement of the posterior part of the gland, the "middle lobe".

Outflow Tract Symptoms

The symptoms produced by this change in the prostatic urethra and bladder neck consist of frequency, urgency, nocturia, poor urinary stream, postmicturition dribbling and dysuria. These changes at the bladder neck may be associated with uninhibited contractions of the detrusor, a condition called detrusor instability or the unstable bladder.

Detrusor instability is now recognized as a major cause of frequency and urgency in obstructed patients,² and about 55% of obstructed patients have detrusor instability on preoperative urodynamic testing. Persistence of instability after relief of obstruction in a third of these patients is an important cause of postoperative symptoms. Since detrusor instability only becomes evident in the older patient, it is suggested that a change in detrusor tension with an increased voiding pressure is an important etiological factor. However, the unstable bladder can occur without significant obstruction and this important observation emphasizes the need to be aware of diagnosing prostatic obstruction in a patient whose main symptoms are frequency and urgency. Other explanations for the unstable bladder have suggested a change in adrenergic receptor response or an increase in the local action of prostaglandins. On the basis of these hypotheses, various drugs have been tried to control the uninhibited contractions but the results are disappointing.

Urologists have long recognized two broad symptom groups in the male patient with suspected outflow tract obstruction. It is the emphasis on these symptoms

that largely dictates the clinical decision for operative treatment. The symptom groups are either obstructive or irritative and attempts have been made to determine which symptoms occur most often within each group. In a study of 318 patients with suspected outflow tract obstruction based on symptoms, 33% had normal urinary flow rates;³ further analysis of these patients showed that the symptoms of urgency, urge incontinence and diurnal frequency were associated with bladder irritability, and the symptoms of hesitancy and slow stream were significantly related to obstruction.

Natural history

The natural history of patients with symptoms of prostatic obstruction is relevant in determining the indications for prostatectomy. The interpretation of symptoms without any ancillary information or urodynamics was studied in a group of 251 patients⁴. In this review, no fewer than 42% were seen only when they had developed acute retention. It was concluded that there were no symptoms or pattern of symptoms that predicted which patient would and which would not develop obstruction and/or require surgery. Others have attempted to quantify symptoms, but no study has produced a reliable method to predict the need for prostatectomy based on symptoms alone.

Ball et al⁵ reviewed the 5-year follow-up of 107 patients with prostatic symptoms who, on first presentation, were not considered clinically in need of a prostatectomy. All of these patients had urodynamic measurements to support the diagnosis. Only 10 patients later required a prostatectomy; 16 noted some general worsening of their symptoms 31 noted an improvement, and the remaining 50 had little or no change in symptoms. Sequential urodynamic studies showed little change; those with detrusor instability continued to show instability. Of all the investigations, the maximum flow rate gave the best guide to the progression of obstruction.

Investigations

IVU. For many years the intravenous urogram (IVU) has been the traditional investigation in the assessment of a patient with outflow tract symptoms. The value of this investigation comes under regular scrutiny especially in terms of cost effectiveness. There is little doubt that an IVU will only rarely affect the management decision for a patient who presents with acute retention of urine; in these patients the main decision is whether to do the investigation, after definitive treatment, or not at all. Others have criticized strongly the IVU even for patients with prostatism on the grounds that the clinical decision was rarely influenced^{6,7}. However even though an IVU may appear a poor cost-effective investigation, for those in whom early ureteric or renal abnormalities are detected it is still of value⁸.

Also, an IVU does give information about upper tract dilatation, renal stones and residual urine. The question that is currently under evaluation is whether or not these features can be detected by a simple ultrasound study plus a plain abdominal ray to exclude calcification in the urinary tract. It is certain that ultrasound can give all the basic information and may show small renal tumors that do not appear on an IVU, but it is a technique that requires good equipment as well as medical expertise.

Urodynamics. The value of a maximum flow rate has been described above. The methods whereby this value is achieved are various and often ingenious. Essentially the volume of urine passed in a measured time is a basic flowtime relationship. Whether the measurement is done by the jug and stopwatch method or by a sophisticated measurement of weight using a strain - gauge transducer, depends on available technology. The maximum flow rate must be correlated with urine volume since the reliability of flow rates for a volume less than 150 ml is subject to wide variation; it is possible to correct the flow rate for a small volume using a flow rate nomogram⁹. Where possible it is better to obtain several flow-rate values since there may be substantial variation during the day.

The flow rate varies between males and females and according to the age of the patient (Table I). The values are only a guideline and should not be used as an absolute guide to the presence or absence of obstruction. If a patient has symptoms of outflow tract obstruction but the flow rate is normal then a detailed urodynamic study is indicated.

TABLE I

**Maximum Flow Rates: Normal Values for Patients with Voided
Volume of Greater than 200 ml¹⁰**

Males under 40 years	22 ml/s
Males 40 - 60 years	18 ml/s
Males over 60 years	13 ml/s
Females under 50 years	25 ml/s
Females over 50 years	18 ml/s

Summary

It is concluded that although symptoms are not reliable in predicting those who will require a prostatectomy, it is possible to select those where a prostatectomy may not treat the main symptoms. Thus the patient with frequency and urgency and urge incontinence due to detrusor instability will gain little from a prostatectomy

unless there is good urodynamic evidence of outflow obstruction. The most satisfactory way to screen the patient for significant obstruction is a urinary flow rate. This objective measure will give a reliable indication of the extent of the obstruction; a flow rate is the best single guide to the severity and if done serially, to the progression of an obstruction.

The debate over the usefulness of an intravenous urogram is not yet resolved. However, modern imaging techniques such as ultrasonography have already become important in screening the urinary tract and in some centers are the basic screening methods.

The interpretation of symptoms, the use of the best available imaging methods and the use of urodynamics for selected cases is the most acceptable approach to determining which patient needs surgery for outflow tract symptoms.

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DISCUSSION

Smith: Now let us have your questions on the symptoms of patients with potential obstruction and the investigation of this.

Hussien: When talking about ureterocele, you suggested doing a partial nephrectomy and leaving it there. Is that the end of the story?

Whitaker: Well no, time cut me off. There are some problems; some potential problems and some real problems. One of the things that can go wrong is that the

thing can fill up with, I guess, tissue fluids, serum and what have you. And it can actually appear as quite a large lump in the bladder again, on subsequent films. And you may need to go back and repair it later. The Americans who've done far more of this, reckon that 25% need to go back and have something done later. But they reckon it's worth it; they're prepared to accept that because it's a much shorter operation. I'm slightly worried about leaving non-visualizable tissue in the urinary tract. There have been, as you know, several cases over the years, of people developing tumors in urinary tracts which have never really ever had urine running through them for any substantial time.

Hussien: That means a theoretical worry that they're still there.

Smith: In your practice, do you not, when you are talking to patients with potential obstruction, say to them; "Well, you can pass your urine. If you really want a better flow, I can give you a better flow but I cannot guarantee to get rid of your frequency".

Chisholm: Oh, I've said that too; and I think they fall into these two groups, the ones who are irritated, and the ones who've really just got a poor stream and dribbling; there's a bit of overlap but you can eventually get from them which is their worst problem.

Smith: And what they want done about it; if anything.

Chisholm: Oh yes. And I think again you can use the flow rate, if you so wish, to show them that they actually do have a good flow, although they may say they haven't.

Smith: Now have we any questions on urodynamics?

Blandy: I wanted to make a comment about Bob's presentation. There is an adult form of congenital urethral valves. You have to watch out for it but it does exist; and it often presents in men in their 30's and 40's, who come up with funny symptoms. And for me, this is the man who seems to have a prostate but didn't ought to, the 35-year-old with frequency. He must have urodynamic investigations done, wouldn't you agree? And if you do, you find in a very small number of these, two little cushions either side of the veru which represent a kind of valve that's got filled with prostatic tissue. It's not the ordinary prostatic enlargement, and it needs a tiny, a milligram, of tissue removed and they get a perfect flow and you cure them.

Chisholm: Not too many of them, but they do exist.

Blandy: Oh yes, they're very rare.

Smith: Last question.

Hussien: After reimplantation in bilharziasis, we find that many patients have a lot of residual urine and very much refluxing; and so we start doing the bladder neck incision for the problem of retrograde ejaculation. Do you think that if we do bladder neck incision at one side as in similar non-bilharziasis cases, then retrograde ejaculation can be stopped?

Chisholm: I think you hope for the best when you do this, don't you? I think there are patients who do do well just with one side. But I don't think I'd like ever to say it's going to be OK. I think you're talking about the sort of person who's very concerned about his fertility and the minute you start to say, well, they might be infertile following this procedure they're off.

Smith: Do you have any comments?

Türkyilmaz: I would like to describe my experience in the United States with the bladder neck in children. In the 1950's and 60's everyone was very enthusiastic about bladder necks in children. The ACMI people come up with a nice tiny resectoscope so everyone started TUR'ing these bladder necks; but the definition varied so much from center to center, and no one really knew what the bladder neck obstruction was; contracted bladder neck in children was just a vague idea, but people started doing TURs in bladder necks. As it became apparent that this procedure was giving rise to retrograde ejaculations and severe strictures, they decided that the bladder neck obstruction was not really what they had thought it, and put their resectoscopes on the shelf. So what we had thought was children's bladder neck contracture turned out to be something else.

Whitaker: There was a long-term pull out for some of those children, and they really did have a very high incidence of retrograde ejaculation. I can't remember the exact rate, but it was high enough.

Smith: We used to have to do something for the bladder neck everytime a ureter was dilated.

Whitaker: Really?

Türkyilmaz: Yes, that was the fashion then.