

Is Staging of Benign Prostatic Hyperplasia (BPH) Feasible?

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Abstract

With better understanding of the natural history of benign prostatic hyperplasia (BPH), the treatment can be tailored to the severity of the disease. The aims of this study were to determine the feasibility of staging BPH according to its severity and choose the optimal therapeutic tool for each category, and for comparing results of various modalities of treatment.

Two hundred and twenty-five patients with clinical BPH were seen between October 1994 and July 1995. Initial assessment included the International Prostatic Symptom Score, and the quality of life index, digital rectal examination, urinalysis, prostate specific antigen, uroflow and residual urine estimation. Patients were then divided into: Stage 1, those with no bothersome symptoms and no significant obstruction, they can generally be watched. Stage 2, those with bothersome symptoms but without significant obstruction, they can be treated with pharmacotherapy/thermotherapy. Stage 3, those with significant obstruction defined as uroflow of less than 10 ml/s with persistent residual urine of >100 ml, transurethral prostatic resection (TURP) would be recommended. Stage 4, those with complications of BPH such as chronic retention of urine and bladder stone, they would need TURP.

One hundred and fifty-nine patients had complete follow up data of at least 2 years. Of the 70 patients who were originally in Stage 1, 59 (89%) remained in status quo, 6 patients developed acute retention of urine and only 1 required TURP. Of the 38 patients in Stage 2, 24 were down-staged to Stage 1 after medication and thermotherapy but 4 still remained in Stage 2 and the other 10 had worsening of symptoms requiring surgery. Of the 46 patients in Stage 3, 30 (65%) had TURP and all except 1 were down-staged to Stage 1. All patients in Stage 4 had TURP and improved.

We conclude that staging of patients with clinical BPH is feasible. It serves as a useful guide for management and improves cost effectiveness.

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Introduction

Staging of disease is important. It serves as a guide for further management and also for comparing the results of treatment. Traditionally this has been used for malignant disease. With the unpredictable natural history of benign prostatic hyperplasia (BPH) and the wide diversity of treatment modalities, can this concept be applied to the management of benign prostatic hyperplasia (BPH) as well?

With a staging system, we can tailor the treatment of the disease according to its severity and therefore achieve an optimal therapeutic yield. Reports of outcome of the disease and comparison of different modalities of treatment would also be more meaningful.

Since 1995, we have proposed a system of staging for BPH¹ using the basic recommendations by the 3rd International Committee for the Initial Assessment of BPH.²

We now have a 2-year follow up data on the initial assessment and treatment of 225 patients using the proposed staging for BPH, and the aim of this paper was to find out whether this staging system was workable and useful. Herein, we present our experience utilising this approach.

Materials and Method

Patients

The study included male patients seen at our specialist clinic above the age of 50 years with lower urinary tract symptoms (LUTS) from October 1994 to June 1995 who were followed up for a minimum of at least 2 years.

Evaluations

The patients were evaluated by taking a detailed medical history and the International Prostatic Symptoms

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Score (IPSS) and the Quality of Life Index (QOL). Physical examination included a neurological assessment and digital rectal examination. Investigations included urinalysis, serum prostate specific antigen (PSA), uroflow and residual urine estimation using transabdominal ultrasound. Transabdominal ultrasound was used also to assess status of the kidneys, bladder and the configuration of the prostate.

Transrectal ultrasound and biopsy were done for patients with suspicious digital rectal examination (DRE) or an elevated PSA to exclude prostatic carcinoma. Urodynamic study with filling and voiding cystometry was done only for patients with suspicion of detrusor instability, neurogenic bladder and those with possible high pressure, high flow obstruction. Flexible cystoscopy was reserved for patients with previous history of transurethral surgery, those with significant residual and equivocal obstruction on urodynamic and transabdominal ultrasound examination showing no protruding prostate. Patients with prostate carcinoma, neurogenic bladders and those with previous transurethral surgery were excluded from this study.

Staging

Most patients could be staged after initial evaluation using two main criteria: symptoms that are bothersome enough affecting quality of life (QOL > score of 3 or more) and significant obstruction, defined as uroflow rate of less than 10 ml/s with a persistent residual urine of more than 100 ml. Patients were then grouped into the following four stages: Stage 1, patients with no bothersome symptoms and no significant obstruction; Stage 2, patients with bothersome symptoms and no significant obstruction; Stage 3, patients with significant obstruction irrespective of the symptoms; and Stage 4, patients with severe complications of obstruction such as upper tract dilatation, bladder stone, recurrent urinary tract infections and persistent gross haematuria.

Treatment

Patients were advised treatment according to the stage of the disease. Watchful waiting was generally recommended for Stage 1 patients, pharmacotherapy such as prazosin, hytrin or proscar for Stage 2, failing which a more invasive procedure such as thermotherapy or transurethral prostatic resection (TURP) was recommended. For Stage 3 patients, surgical treatment with TURP would be the first option taking into account the patient's age and co-morbidity. Surgery would be strongly recommended for Stage 4 patients.

Follow up and Evaluation

During the follow up period, patients were evaluated with IPSS score, including QOL index, uroflow rate and residual urine estimation. The modality of treatment

TABLE I: STAGING OF BENIGN PROSTATE HYPERPLASIA

Stage 1	No significant obstruction, no bothersome symptoms (QOL <3)
Stage 2	Bothersome symptoms, no significant obstruction a. Uroflow rate >10 ml/s b. Uroflow rate <10 ml/s
Stage 3	Significant obstruction (RU >100 ml, uroflow rate <10 ml/s) a. With no bothersome symptoms (QOL <3) b. With bothersome symptoms
Stage 4	Complications of BPH—bilateral hydronephrosis, recurrent infection, bladder calculi

QOL: quality of life index; RU: residual urine;

BPH: benign prostatic hyperplasia

would be modified to improve their quality of life and prevent complications. The frequency and duration of follow up depended on the severity of the disease, the types of treatment and the patients' response.

Results

Initially there were 286 patients, 61 patients were excluded because of neurogenic bladder and detrusor dysfunction, previous surgery and prostatic carcinoma (6 patients). Their ages ranged from 50 to 91 years, with a mean of 63 years. The initial staging of these patients is shown in Figure 1, and the initial treatment is shown in Figure 2.

After a minimum of 2 years follow up, as of August 1997 there were 159 patients available for further study, their initial staging is shown in Figure 3.

There were 70 patients initially in Stage 1. On watchful waiting, 62 (89%) still remained in Stage 1. Two patients deteriorated and required medication. Six patients had episodes of acute retention of urine, 1 requiring TURP, while another 5 had successful trial off catheter. Of these, 2 patients were on pharmacotherapy and 3 were back on watchful waiting (Fig. 4).

Thirty-eight patients were in Stage 2 initially. Due to bothersome symptoms, all these patients had trial off pharmacotherapy—34 had alpha blockers and 4 had proscar. Among these, 12 patients had positive urine culture, responded well to antibiotic and had improvement in flow rates and symptoms. Seven patients had no improvement in symptoms despite alpha blockers, their urodynamic assessment showed unstable bladders with normal to low pressure with flow more than 10 ml/s. They were put on anticholinergics and 3 had improvement of their symptoms which were down-staged to Stage 1 whilst 4 were still in Stage 2. The rest of the 19 patients who had low flow were put on alpha-blockers or proscar. Only 5 patients were down-staged to Stage 1. Of the other 14 patients who had no improvement, 4 opted for transurethral microwave thermotherapy (TUMT) while 10 patients opted for TURP/TUIP (transurethral incision of the prostate) with improve-

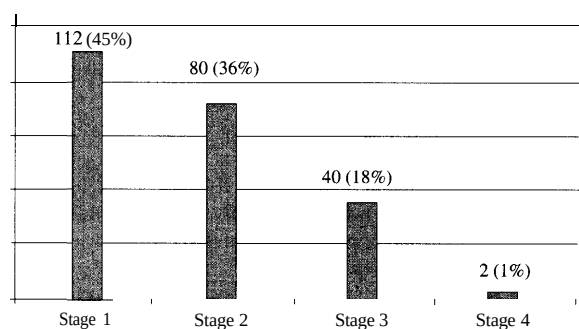
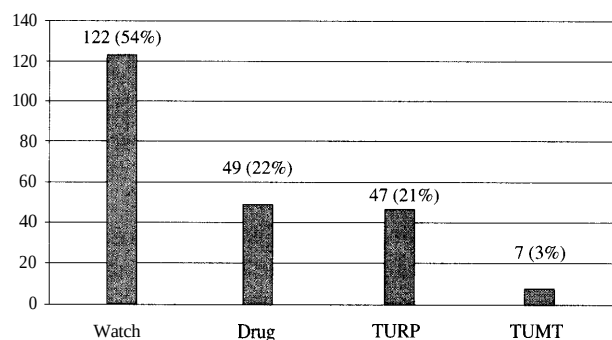
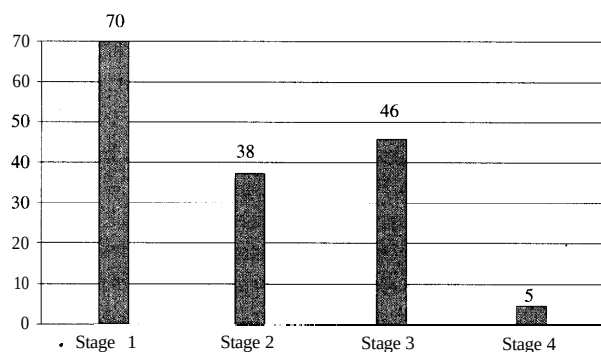
Fig. 1. Distribution of initial staging ($n=225$).

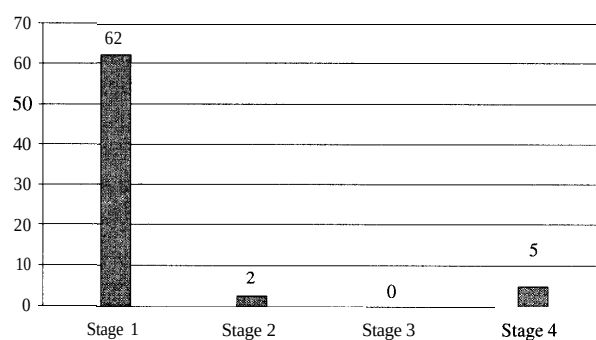
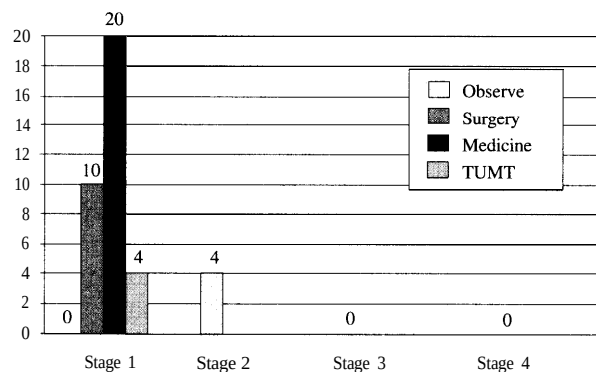
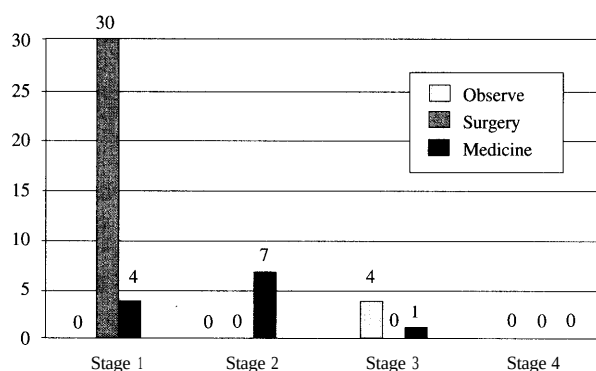
Fig. 2. Treatment given after the initial staging.

Fig. 3. Staging after 2 years ($n=159$).

ment and at the time of study all were in Stage 1 (Fig. 5).

Of the 46 patients who were in Stage 3 initially, 30 opted for TURP and all were down-staged to Stage 1. Fifteen patients opted for pharmacotherapy, 4 were down-staged to Stage 1, 7 to Stage 2, and 1 patient remained in Stage 3. Four patients opted for watchful waiting and at the time of study were still in Stage 3. None of the patients on conservative treatment went into acute retention or developed other more serious complications of obstruction (Stage 4) (Fig. 6).

There were 5 patients in Stage 4, 2 had bladder stones, 2 had recurrent urinary tract infections and 1 had gross haematuria. None presented with chronic retention with dilated upper tracts in this series. All these 5 patients had TURP with good results.

Fig. 4. Outcome of patients who were initially in Stage 1 ($n=70$).Fig. 5. Outcome of patients who were initially in Stage 2 ($n=38$).Fig. 6. Outcome of patients who were initially in Stage 3 ($n=46$).

Discussion

Staging is the determination of distinct phases or period in the course of a disease, the life history of any biological process. Usually the method of staging involves the least invasive ways to group the patients' problem into distinct groups. It could tailor the correct treatment for the same group of patients so as to avoid failure and improve cost-effectiveness. The objectives of this study were i) to determine the feasibility of staging the patients with clinical BPH according to its severity for treatment purposes, and (ii) for comparing results of various modalities of treatment.

The Third International Conference on BPH, recommended the basic evaluations for patients with LUTS, that of IPSS including the QOL index, DRE, serum

creatinine, PSA, uroflow rate measurement and residual urine.² The conference also discussed in detail, the various options for treatment of BPH, that of watchful waiting, pharmacotherapy, thermotherapy, laser and conventional TURP. A staging system for BPH would facilitate the selection of patients for the various modalities of treatment, bridging the gap between the recommended evaluation and the treatment of the disease.¹

IPSS is the modality to measure the patient's urinary complaint. Generally it has poor correlation with the uroflow rate, residual urine and the degree of obstruction.³⁻⁵ In our experience, the IPSS correlated only 25% with the degree of obstruction, the QOL index has a higher correlation with the severity of obstruction (33%) consistent with the literature. This is the reason why the QOL index is used in the staging system rather than the IPSS. In addition, from our experience, urinary flow rate and persistent residual urine had better correlation with obstruction at 52% and 73%, respectively.⁷

This proposed staging system is simple and non-invasive, using the basic recommended evaluations. It requires the use of an office ultrasound and the uroflow machine for estimation of the residual urine and the flow rate. The ultrasound is also very useful in assessing the configuration of the prostate, the size and the degree of protrusion of the gland into the bladder lumen, and the presence of the median lobe. This information would have important influence in our recommendation for further management of BPH. It is our impression that the degree of protrusion of the prostate gland into the lumen of the bladder which can be easily seen on transabdominal ultrasound is directly related to the degree of outlet obstruction, and that surgery is the most effective modality of treatment. This need to be validated.⁶ In addition, the transabdominal ultrasound would also help to assess the status of the bladder wall, presence of bladder diverticuli, stones and tumour. The upper tract could be assessed at the same sitting for hydronephrosis.

The essential advantage of this system is to enable urologists to detect patients who have significant obstruction which if not treated, will lead to detrusor dysfunction and those with potential risks of developing chronic retention with hydronephrosis. Therefore in this staging system, weightage has been given to the detection of persistently high residual urine with uroflow rate of less than 10 ml/s. It is generally accepted that the common denominator of the complications of obstruction of BPH is a high residual urine volume. Persistently high residual urine could be considered as an important sign of bladder decompensation. When such an event occur, the earlier the obstruction is relieved, the better the outcome.

Though no patient in this series had upper tract dilations, in our study of patients admitted as emergency

with retention of urine to the ward, 8 out of 160 (5%) had evidence of hydronephrosis and renal impairment (unpublished data). Thus chronic retention of urine is still an important complication of BPH in our community.⁷

For patients who were initially in Stage 3, 30 had TURP and all were down-staged to Stage 1. Twelve opted for pharmacotherapy, 4 were down-staged to Stage 1, 7 to Stage 2 while 1 remain in Stage 3. Of the 4 patients who opted for watchful waiting, they have remained in status quo. Of the 38 patients who were initially in Stage 2 and treated with pharmacotherapy, 20 improved to Stage 1, 4 patients subsequently opted for TUMT, while 10 required TURP with improvement post-procedure and were at the time of study in Stage 1. Four patients opted for watchful waiting after failed trial off medication and they remained in Stage 2. Thus, the staging system can be used to compare the various modalities of treatment, stage for stage and this would be a more rational way of comparing efficacy in treatment of BPH.

A good test of the feasibility of the staging system is to look at the outcome of treatment of the disease. In this series of patients followed up for at least 2 years, all 45 patients who had TURP had good outcome except one.

As in any clinical staging system, patients may be over-staged or under-staged. Over-staging may lead to unnecessary surgical interventions, while under-staging may lead to undesirable consequences from obstruction. This can be minimised by repeating the residual urine for those with abnormally high value during the same visit or subsequent visit, a week or two later.

Almost 90% of patients with LUTS could be stratified, at initial assessment. Those with equivocal results and could not be staged would need to have invasive investigations such as full urodynamic studies and flexible cystoscopy under local anaesthesia. For example, a patient with a relatively good flow-rate of more than 15 ml/s, but with a relatively high symptom and bother-some score would need full urodynamic studies to detect detrusor instability and or high pressure, high flow obstruction. A patient with persistently high residual urine with relatively good flow rate and with no protruding prostate on abdominal ultrasound would need a flexible cystoscopy and urodynamics for further assessment to differentiate detrusor dysfunction from outlet obstruction.

Assuming the staging system is feasible and workable, this system could reflect the degree of development of the medical services of a particular country and the degree of awareness of the population regarding prostatic diseases. Currently in our study, the distribution has been fairly consistent with Stage 3 and Stage 4 patients forming 18% to 20% seen at our outpatient services. This is the group of patients who needs to be counselled with regard to early relief of their outflow obstruction to prevent irreversible damage to their bladder and the

upper urinary tract. On the other hand, the other 80% of patients could be treated conservatively with watchful waiting or pharmacotherapy. In more developed countries, there will be less patients in Stages 3 and 4, while in less developed countries, there will be more such patients.

An appropriate staging system should also be able to stratify the disease into proper grouping, and that there should not be any abrupt change in the staging on follow up. With appropriate treatment, the condition should improve and without intervention, the disease process would remain the same or worsen gradually.

For patients who were initially in Stage 1, it is interesting to note that after 2 years of follow up, the majority (89%) on watchful waiting remained status quo, 5 patients progressed to Stage 2 while 6 developed acute retention of urine. Out of these 6 however, only 1 required TURP while the other 5 could still be treated conservatively.

It would seem that this staging system could not predict the development of acute retention of urine (ARU). The cause of acute retention of urine is not known for certain. It has been postulated that prostatic infarct is an important cause.⁸ This probably explained why in a recent community study of the risk factors for ARU, the size of the prostate and the age of the patients are important risk factors apart from low flow rate.⁹ In our study of patients with ARU, it was found that they generally have markedly raised PSA, and if the DRE was normal, only those with PSA more than 50 ug/l would need transrectal ultrasound and biopsy to exclude a carcinoma.¹⁰ Also, it was found that patients with normal PSA had a higher chance of successful trial off catheter than those with higher PSA value,⁷ pointing to the possible aetiology of prostatic infarction or inflammation as an important cause of ARU in BPH. Thus ARU could develop in any patients with BPH who is on conservative management, and the incidence in our present series was 6 out of 111 (6%) patients, on conservative treatment followed up for 2 years.

Patients with detrusor instability due to obstruction may be under-staged. They may be suspected clinically in those patients who have significant symptoms with bothersome score and who persistently cannot void a good volume of at least 150 ml for a uroflow estimation. Patients with symptoms of frequency and urgency, with relatively good flow rate, and no significant residual urine, and who do not respond to alpha-blockers are also suspected, and they would be further investigated with

filling-voiding cystometry and flexible cystoscopy.

Conclusion

With at least two years follow up of a cohort of 159 patients with clinical BPH, we found that staging of the disease for further management is feasible and the outcome is cost-effective. About 50% of patients were confidently managed with watchful waiting, while those who had more invasive treatment (20% had TURP) had good results. The staging system can also be used to compare results of various modalities of treatment for BPH. The staging system is simple and does not require any invasive diagnostic procedures for the majority of patients. It is useful for the day-to-day management of the disease.

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