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Factors Accountable for Prolonged Hospital Stay in Patients undergoing Transurethral Resection of Prostate: A Prospective Analysis of Seventy Consecutive Cases

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Abstract

Objective: To determine the clinical and surgical factors leading to Prolonged Hospital Stay in Patients undergoing Transurethral Resection of Prostate.

Study Design: This is a prospective, descriptive, case series.

Place and duration of study: Department of Urology, Dr. Ziauddin Hospital Karachi, from July 2007 to June 2008.

Methodology: It is a single centre study of seventy consecutive cases of transurethral resection of prostate (TURP). 75% of patients were admitted through outpatient clinic after complete evaluation while the remaining were transferred from emergency and other units. All patients were operated by qualified and experienced surgeons. Factors responsible for possible delay in discharge (surgical and clinical) were determined in patients who had an extended stay. Mode of admission, age, prostate size, comorbid conditions, blood loss during surgery, surgical trauma and change of serum sodium level were the factors related to morbidity and delay.

Results: There were total 70 patients aged 52-84 years with prostate volume ranging from 42 to 110 gms. 53 patients (75%) were admitted through consultant clinics and most of them were discharged in time (3-5 days). Those that were admitted from emergency or other units had a prolonged hospital stay of 4 to 12 days. In prolonged stay group, fever was the reason in 7 (10%) patients and clot retention in 5 patients. 5 patients stayed for more than 8 days because of cooperative issues.

Conclusion: Leading factors responsible for prolonged hospital stay were fever, and haematurea. Patients with multiple comorbids like diabetes, hypertension, urinary infection and indwelling urethral catheter also had high chances of an extended stay.

Keywords: Prostate, Benign prostate hyperplasia (BPH), Transurethral resection of prostate (TURP), Hospital stay

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Introduction:

Benign prostate hyperplasia (BPH) is a common problem of old age. An ideal, complication free treatment of BPH is still a dream. From alpha adrenergic receptor blockers, and 5-alpha reductase inhibitor[1,2] to laser ablation of prostate[3] none of these treatments are free from side effects and complications. Transurethral resection of prostate (TURP) is still considered the best and most commonly practiced surgical procedure for persistent, progressive prostatism all over the world[4]. Like other surgical modalities TURP also has its own virtues and demerits[5]. One of the arguments raised against TURP is prolonged hospital stay as compared to Thermotherapy (TUMT)[6], Laser ablation (VLAP)[3] or Electrovaparisation of prostate[7] that can be either done as a single day procedure or with a short stay in the hospital.

Haematurea, electrolyte imbalance, hypotension, post TURP syndrome, failure to void after catheter removal and incontinence are contributing factors credited for prolonged hospital stay

in cases of TURP[8]. Our objective of conducting this study is to find out factors responsible for the extended hospital stay in our cases and also to suggest ways to minimize that period.

Material and methods.

This was a prospective analysis of seventy consecutive cases of TURP, conducted in our centre without any exclusion criteria. All the patients who required surgery because of severe symptoms or retention of urine secondary to BPH were included in this study. Patient's assessment began from outpatient department, with detailed history and physical examination. Laboratory evaluation included complete blood picture, blood sugar, urea, creatinine and electrolyte levels. Urinalysis and culture sensitivity were performed in selected cases. Chest X-ray, ECG and Ultrasound of kidneys, bladder and prostate were done in all cases. Pre operative Intravenous Pyelogram (IVP), Transrectal ultrasound prostate (TRUS) and Uroflowmetry (UFM) were carried out selectively.

Those patients, who had major co-morbidity, were further evaluated by relevant consultants, preferably in out-patient clinics. Blood was only arranged for patients whose prostate size was more than 100 grams and had relatively low hemoglobin. All TURP in this study were conducted under spinal anesthesia given by an experienced anesthesiologist. A course of pre operative intravenous antibiotic was started according to sensitivity or as prophylaxis.

Blandy's technique was followed for TURP[9] i.e. first resecting and homeostasis of the median lobe and then the lateral lobes. Technique was modified for very large prostate or if there was any anatomical variation. After proper positioning and draping, Cystourethroscopy was done by a 21 French Cystoscopy sheath with visual obturator using 12 degree wide angle lens to assess urethra, prostate, ureteric orifices and bladder. Urethral dilatation was done only in cases where passage of scope was not easy. 24 or 26 French intermittent drainage Resectoscope with passive cutting working element were used for resection. Monopolar diathermy on pure mode was used. Blend mode was used in rare cases when highly vascular gland was encountered. Haemostasis was done by pin point coagulation. Use of roller ball for haemostasis was avoided. 5% dextrose water was used for irrigation during surgery.

Resection began from median lobe at 6 O'clock position. After completion of median lobe, resection of right lateral lobe started from 11 O'clock position and was gradually moved anti clockwise to 6 O'clock position. Similar approach was applied for left lateral lobe. More cautious resection was done for obstructing prostatic tissue near Varumontanum because of possible chance of sphincter damage[10]. After completion of resection and haemostasis, check Cystoscopy was performed and instrument was removed with full bladder to check the flow by applying gentle pressure over suprapubic area. All patients were catheterized with siliconized latex, 22 French three way Foley's catheter. Mild pressure was applied on catheter by taping it just above the groin crease.

Normal saline was used as uninterrupted bladder irrigation post operatively. Two liter intravenous dextrose-saline or normal saline was advised for patients for next 24 hours. Four hours after surgery, patients were allowed to take oral fluids. On next day traction was released, intravenous fluids and antibiotics injections were stopped. Irrigation was advised on intermittent mode. On the first post operative day, patients were encouraged to come out of bed and take plenty of fluids. Serum sodium and hemoglobin levels were also checked. On second post operative day catheter was removed and patient was discharged after he passed urine few times. If patient developed significant haematurea or clots retention, catheter was detained till urine appeared clear.

In all the patients who had an extended stay, the mode of admission, age, prostate size, comorbid conditions like diabetes, high blood pressure, urinary tract infection, blood loss during surgery, change of serum sodium level were revised. Operative blood loss was assessed by change of

hemoglobin. As a rule, post operative blood count and electrolytes was performed on the first post operative day. To assess fluid absorption, fluid overload, dilution hyponatremia or post resection syndrome, pre and post operative serum sodium level were compared.

Results:

Seventy patients were evaluated in this study who underwent TURP in Ziauddin Hospital. Seventy five percent patients were admitted through consultant clinics while emergency admission and in house referrals were 17 % and 8 % respectively. Age of the patients ranged from 52 to 84 years and seventy percent patients were above sixty five years of age. (Figure 1). Seventy percent patients suffered from different illnesses, hypertension and diabetes being on the top (Figure 2). Thirty percent patients had more than one associated disease, three percent were in renal failure secondary to bladder outlet obstruction. Fourteen percent patients had urinary tract infection. Figure 3 shows comparison between pre and post operative hemoglobin. Average loss of hemoglobin was about one gram. Relation of serum sodium level to pre and post operative period is also shown in the same figure.

Volumes of prostate are shown in Figure 4. Though TURP is considered as a procedure for mild to moderately enlarge prostate but in our study we also performed it on prostate of 100 grams or larger in size. Preoperative stays of the patients are shown in Figure 5. Sixty five percent patients had a stay of less than 24 hours, while 20 % stayed for only 2 days. In 15% patients, a prolonged pre operative stay was noted. Majority of this group were initially under care of physicians and had multiple co morbidities.

Figure 5 also highlights the range of post operative stay. Seventy five percent patients were discharged within three days. About five percent patients had stay of more than six days. Total hospital stay (including both pre operative and post operative period) is also shown in Figure 5. Sixty five % patients were discharged within five days, 20 % discharged in 8 days and 15 %

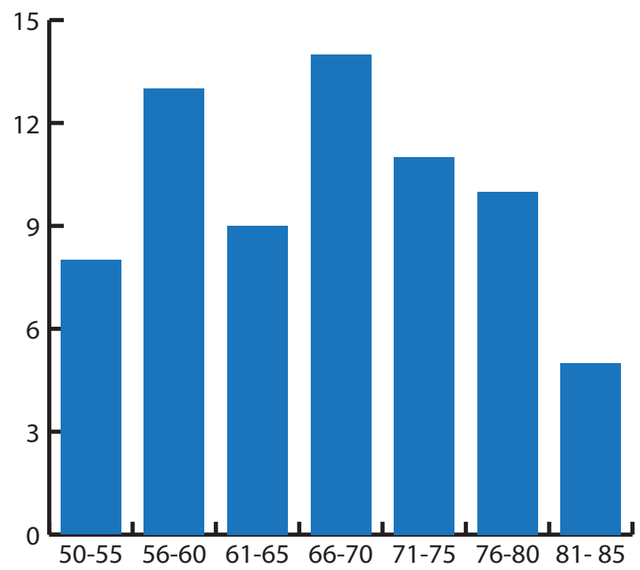

Figure 1: *Age of the patients*

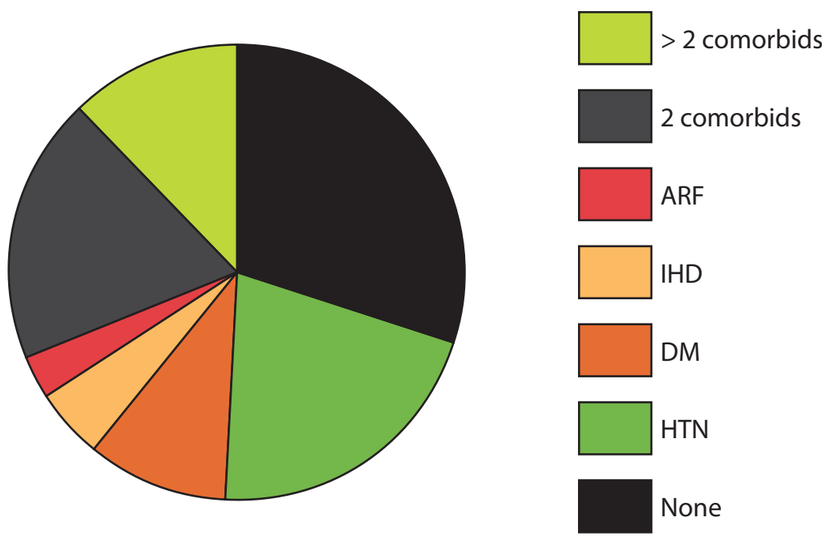

Figure 2: *Co-morbid conditions*

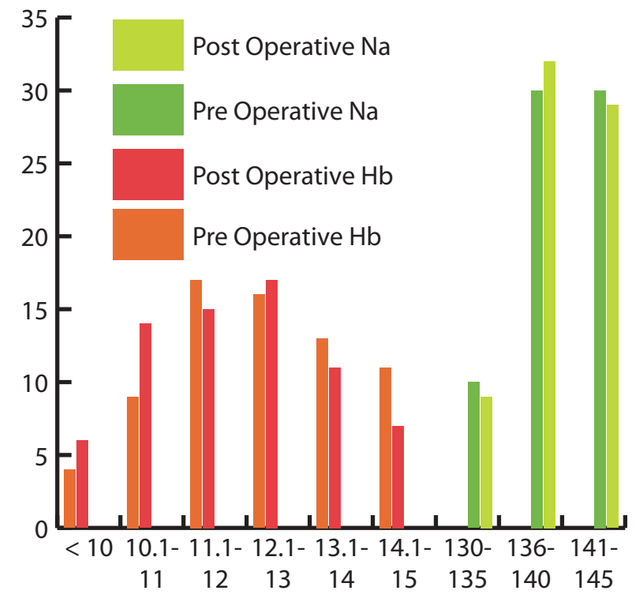

Figure 3: *Pre and Post-Operative Haemoglobin and sodium levels*

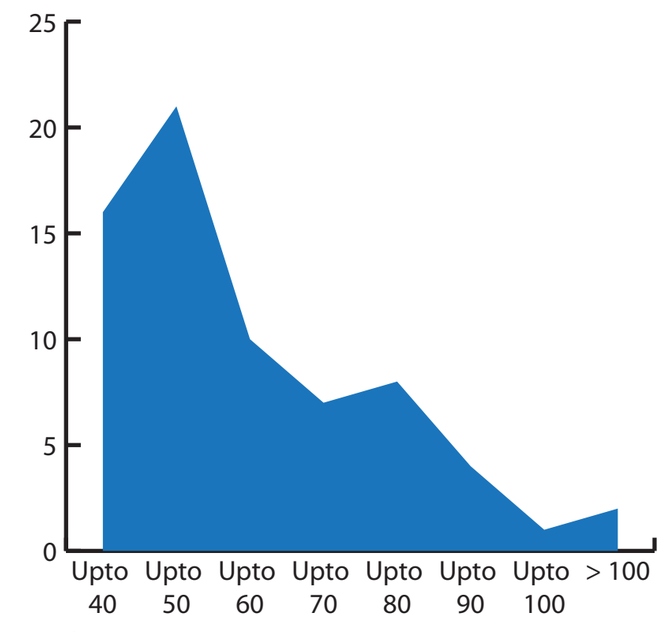

Figure 4: *Volume of the Prostate*

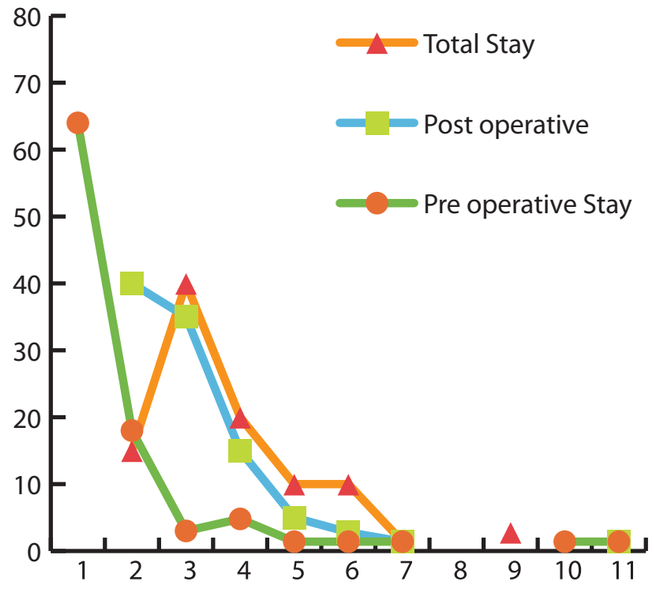

Figure 5: *Hospital stay*

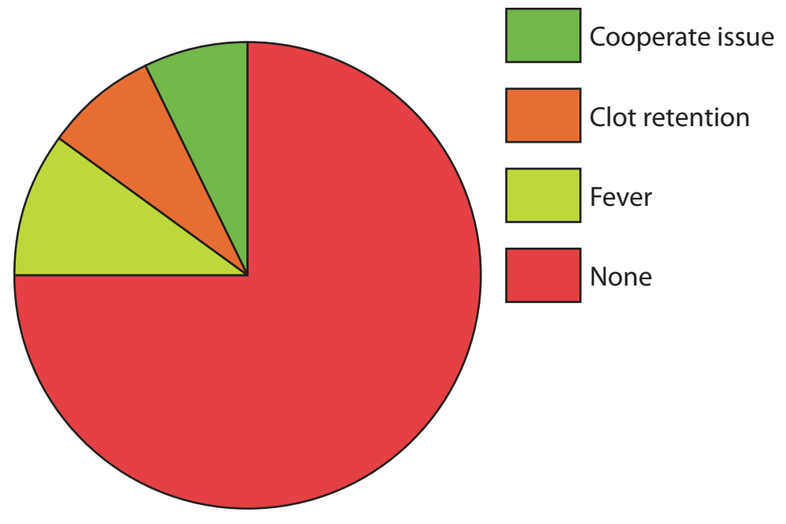

Figure 6: *Causes of extended hospital stay*

patients had an extended stay of more than ten days. Reasons of extended stay are shown in Figure 6. Fever, clot retention and co-operative issues were main factors accountable for delay in patients discharge. Majority of delayed discharged patients had either positive urine culture or multiple medical illnesses. Similarly 60% patients with clot retention had history of urinary infection and use of anticoagulant medications.

Discussion:

With increase in average life expectancy the prevalence of geriatric problems like diabetes, hypertension and prostate hyperplasia is rising[11]. BPH is a major health issue in older men that has a bad impact on the social, professional, religious or sexual aspects of patient's life[12]. Trains of treatment modalities are available to manage this problem but none of them including TURP are free from mortality and morbidity[8]. Beside the operating success and good results, cost of any treatment is also an important consideration in our society. In Pakistan, health insurance is not very common. Similarly social security and old age benefit programs are not very effective. In majority, cost of the treatment has to be suffered by the patient or his family. Cost of hospital stay, including off work expenses has a significant impact on overall treatment expenditure. This study is an effort to find out the causes of prolonged hospital stay in patient who had TURP for benign Prostatic hyperplasia in our setup.

Being a tertiary care unit, the department of Urology received patients not only from specialist clinic but also from emergency room and other medical and surgical departments. A complete evaluation in the Outpatient clinic is the most important factor that has a major impact on the hospital stay. 'Chose well, cut well and get well'[13] works as a rule in our cases. Eighty five percent of electively admitted patients had best outcome in terms of pre operative stay, post operative fever, and over all hospital stay. While those who were admitted through emergency were obviously not properly evaluated before, therefore resulting in prolonged per operative stay.

In this case series we operated on a group of patients from 52 to 84 years of age, and wide range of prostate size up to 110 grams with high associated poor health. Interestingly, against the common belief of high incidence of complication in cases of extreme age and huge prostate, our results showed that these factors had a minimal impact on overall treatment outcome and hospital stay.

The overall health status of our senior population is not good. Seventy percent of our operated population are suffering from either hypertension, diabetes or other chronic illnesses. The treatment related morbidity and mortality of any illness is in direct proportion to age and other associated life threatening comorbid conditions[14]. With this high incidence of co-morbidity, 76 % patients who were treated by TURP had a hospital stay of only 3 to 5 days. Data clearly showed that prolonged pre-operative and post operative

stay were mostly seen in those patients who had more than one associated illness.

Excessive bleeding during the surgery indicates the highly vascular nature of the gland[15]. Chances of bleeding increases in patients with high blood pressure, patients on anticoagulant medicines and in patients with indwelling catheters[16] or urinary infection. On comparing preoperative and post operative hemoglobin, the average hemoglobin loss was 1.1 grams which is compatible with international literature. Though the loss is similar, the scenario is not. 70 percent of our patients had many comorbids. Also we dealt with relatively large gland size i.e. thirty percent had prostate size of more than sixty grams. In this back ground our operative blood loss is not much. We can maintain such results or may further improve it by using continuous irrigation sheath during resection, using good quality Diathermy machine and cutting loops of standard shape, size and width.

Post TURP electrolyte imbalance, hypotension, dilution hyponatremia or post prostate resection syndrome[17] badly effect the post operative recovery and total hospital stay[18] of the patient. The TURP syndrome was defined as a sodium level after TURP of ≤125 mmol/L, with two or more symptoms or signs of TUR syndrome. Symptoms or signs attributed to TUR syndrome were nausea, vomiting, bradycardia, hypotension, hypertension, chest pain, mental confusion, anxiety, parasthesia, and visual disturbances[19]. It's incidence is based on many factors including patient's cardiac status, pre operative serum sodium level, duration of surgery and nature of irrigation fluid[20]. Dealing with large gland, long resection time, excessive operative bleeding and early significant venous leakage may lead to excessive absorption of irrigation fluids i.e. dilutional hyponatremia.

In Ziauddin Hospital, TURP was started in early eighties. Since then, 5% dextrose water was used as an irrigant during resection. 5% dextrose is non hemolytic, iso-osmolar in nature, safe, easily available, cost effective and easy to handle. Mild stickiness of the instruments or caramelization of the cutting loops are minor factors against the use of dextrose water. In this study, we never encountered Post TURP syndrome. In majority, the pre and post operative serum sodium levels in our patients were comparative. Insignificant fall in sodium level (less than 2 mg/dl) was seen in only those patients who had relatively low serum sodium level before surgery. However, this difference is minor and never been symptomatic or contributed for delay in discharge. In our view, optimizing sodium and other electrolytes before surgery, expertise and experience in surgical skills, quick and sharp resection, pin point coagulation and early control over bleeding vessels were essential steps to avoid excessive fluid absorption during surgery.

Importance of irrigating fluid during TURP has been identified from the early days of its practice[21, 22]. Many other irrigating fluids are available since the last fifty years including plain water, 1.5 % Glycine, Manitol or Sorbitol[21]. Different fluids have their own benefits but none of them are free from side effects[23, 24, 25]. Plain water is easily available and low of cost but is mostly avoided because of high chances of intravascular hemolysis and hypoosmolality on its excessive absorption[23]. Similarly 1.5% glycine that is commonly used in majority of centers has many issues. Chances of fluid absorption and fluid overload are also present with its use[25]. It is not because of the nature of fluid but the surgical technique, procedure duration and expertise of operator that has an impact on overall fluid absorption. It is estimated that fluid absorption rates varies from 20 ml/min to 200 ml/min during resection[26]. Glycine osmolality is 190 mosmol/kg less than of dextrose water. It did not causes intravascular hemolysis on absorption. Complication with its use includes, ammonia toxicity[27], encephalopathy[28], blurring of vision or even blindness[29]. The chance of complication with glycine use is increased in patient who have a compromised liver or renal functional status[30].

Technically, surgery related stay is mainly post operative. 75 percent of our patients were discharged within three days, without indwelling catheter. The remaining twenty five percent

needed some improvement to minimize total hospital stay. Fever, haematuria and clot retention were the main reasons of prolonged post operative stay in some of our patients. Usually because of the risk of thromboembolic events, cardiac, hypertensive and diabetic patients were on anticoagulant medicines. Before surgery it is very important to hold all those medications that have an impact on bleeding[31]. Such medicines were stopped one week before admission. It is very important to explain the complications that may occur after stopping such medications to the patient and his family.

Bacteriuria after endoscopic procedures is a documented fact. Its incidence varies from 24% to 60%[32]. Symptomatic infection is up to 5%. Delayed sequel of infection was also reported like secondary hemorrhage, stricture and bladder neck stenosis[19]. In this study, thirty percent cases were catheterized before surgery with ten percent documented infection. Both these factors contribute for fever[33] and haematurea, therefore resulting in delayed discharge from the hospital. Best way to avoid these complications is to perform preoperative urine culture and sensitivity. Use of prophylactic or therapeutic antibiotic is also very important[16] .

In literature, the other causes of delayed catheter removal and prolonged hospital stay are urinary retention[34] and incontinence of urine[35,8]. Complications like retention of urine or incontinence are either because of lack of skills, poor technique or because of detrusar failure. None of our patients had such problems. We can easily avoid these complications by strictly following basic principles and keeping our resection area within surgical landmarks.

Conclusion:

In an experienced hand, TURP is a safe and cost effective treatment modality for BPH with minimum morbidity and mortality. Proper selection of patients and good preoperative evaluation can make this procedure more cost effective. Preoperative urine culture especially in a catheterized patient and cessation of all anticoagulant has a positive impact on operative and post operative phase. General health of the patient specially diabetes and hypertension are common risk factors for post operative complications that account for prolonged hospital stay. Use of 5% dextrose water as irrigant is safe and does not cause excessive fluid load, or hyponatremia. Availability of full range of proper instrument, good quality diathermy machine are as important as following surgical principles.

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