

Emergency Department Visits Following Transurethral Resection of Prostate in the Elderly: Does Duration of Postoperative Catheterization Count?

Abstracts

Background: Elderly patients with benign prostatic hyperplasia are increasingly having minimally invasive surgeries due to their safety. There is also a drive to minimize the duration of postoperative catheterization following transurethral resection of the prostate to reduce hospital stay and encourage early ambulation. These are desirable in the elderly to improve outcomes. Can early catheter removal be done safely in the geriatrics without an increase in presentation to the emergency department with complications? We compare the emergency presentation of elderly patients who had early and delayed catheter removal following transurethral resection of the prostate. **Materials and Methods:** This was a retrospective review of transurethral resection of the prostate in the elderly (≥ 70 years) within 2 years in a single hospital. All the patients had monopolar transurethral resection of the prostate and were categorized based on the duration of postoperative catheterization as either early (third postoperative day) or delayed ($>$ third postoperative day). The duration of catheterization was based on surgeon preference. Patients with intraoperative complications were excluded. Data on clinical presentation, comorbidities, and presentation at the emergency department were retrieved and analysed. **Results:** Forty-one patients were studied with the mean age of patients being 76 ± 4 years. Twenty patients had early catheter removal and 21 had delayed catheter removal. A total of nine patients presented to the emergency department within the 30-day postoperative period with either bleeding urinary retention or incontinence requiring re-catheterization, six had early catheter removal, and three had delayed catheter removal. The catheter duration, preoperative ASA status prostate volume, and preoperative indwelling catheter were not statistically significant determinants of presentation to the emergency department in these elderly men. The presence of comorbidities assessed using the Charlson Comorbidity Index was a statistically significant variable to presentation at the emergency department after surgery $P = 0.006$. **Conclusion:** Early catheter removal is safe in elderly patients following transurethral resection of the prostate, however, there is a risk of presentation to the emergency department with complications, especially in patients with comorbidities.

Keywords: *Complications of TURP, Duration of catheterization after TURP, TURP in elderly*

Introduction

Benign prostatic hyperplasia is a disease of middle-aged and elderly men. The indications for surgical include bothersome lower urinary tract symptoms, failed medical therapy, and complications such as refractory haematuria, obstructive nephropathy, or recurrent urinary tract infection.^[1] In the presence of these indications, transurethral resection of the prostate is the gold-standard approach.^[2] Though this approach may be limited by prostate size, this approach is universally available, cost-effective, and associated with minimal complications.^[3]

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Elderly surgical patients are unique as they are prone to more perioperative morbidity and mortality due to fragility, the presence of comorbidities, and homeostenosis.^[4] Furthermore, healing may be delayed due to the aforementioned factors.^[5,6] Hence transurethral resection of the prostate in the elderly just like any other surgical procedure in the elderly calls for meticulous perioperative care to ensure a satisfactory outcome and reduce postoperative complications such as bleeding, urinary retention, urinary tract infection, and deep venous thrombosis.^[7]

Postoperative urethral catheterization is essential following transurethral resection

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of the prostate. It is largely used for continuous bladder irrigation to reduce bleeding and clot retention.^[8] It also helps to rest the bladder and avoid pain while voiding till oedema over the prostatic fossa resolves and epithelialization has occurred. There is however no unanimous consensus on the time to remove the catheter.^[9,10] The quest for a shorter duration of postoperative catheterization is currently of interest amongst urologists either due to the pressure of limited hospital bed spaces or demands for shorter hospital stays from the patients. There are several reported safe attempts to limit the duration of postoperative urethral catheterization to ensure early postoperative mobilization and reduce the length of hospital stay.^[8,11,12] Same-day transurethral resection and discharge have been documented.^[13,14] Most of these studies are on both middle-aged and elderly patients with limited emphasis on the consequences of early catheter removal in the elderly. Early postoperative catheter removal in the elderly is desirable as it would ensure early ambulation, better quality of life, and limit complications of prolonged urethral catheterization however is it safe considering the fragility and possibility of delayed healing in this group of patients?

Presentation to the emergency department within 30 days postoperative period following transurethral resection of the prostate occurs in 5.3%–15% of patients.^[15] This is usually due to hematuria.^[16,17] Other possible causes of presentations include acute urinary retention, urinary tract infection, or incontinence of urine.^[18] In a recent review of readmission following transurethral resection of the prostate in Europe, the readmission rate was 14.4% and the aetiologies were haematuria at 6.8%, urinary tract infection at 4.3%, and urinary retention at 3.1% respectively.^[19] In the same review patients who were readmitted were older than those who were not readmitted.

We hereby review transurethral resection of the prostate in elderly patients and compare subsequent presentation at the emergency department among those who had early and delayed postoperative catheter removal.

Patients and Methods

This is a retrospective study carried out on all elderly patients defined as those aged ≥ 70 years who had transurethral urethral resection of the prostate during a 2-year study period (March 2021– February 2023) for benign prostatic hyperplasia. The inclusion criteria were elderly patients with complete clinical records who had monopolar transurethral resection of the prostate for benign prostatic hyperplasia within the study period. Patients who had intraoperative complications during the transurethral resection of the prostate were excluded because the duration of post-operative urethral catheterization as well as the postoperative recovery may be affected by this variable. Following ethical board approval, clinical data extracted from the records of all eligible patients were reviewed. Having met the indication for surgery, the patients were

counselled, and optimized, and informed consent for surgery was obtained. The patients had a urethroscopy using a 22fr urethral sheath and monopolar transurethral resection of the prostate using a 24fr continuous flow resectoscope with sterile water as the irrigant under regional anaesthesia. Resection time varied from < 1 hour to about an hour based on prostate size. Continuous bladder irrigation was done with normal saline for 24–48 hours till the effluent was clear or pink and the catheter was removed on the third postoperative day or beyond based on the surgeon's assessment. Patients with acute complications presented to the emergency department for re-evaluation and further care otherwise the patients were subsequently followed up at the outpatient clinic. Clinical data on the indication for surgery, comorbidities based on the Charlson Comorbidity Index (CCI) classified as 3 points (age 70–89 years and no other comorbid factor) and > 3 points (age ≥ 80 years or other comorbid factors), prostate size, American Society of Anesthesiologist Physical status classification (ASA status) duration of catheterization (3 days or > 3 days), and presentation at the emergency department (ED) were retrieved, and analysed using descriptive and inferential statistics.

Results

A total of 189 transurethral resection of the prostate was done during the study period, however, 41 patients met the inclusion criteria for this study and were thus reviewed. The mean age of the patients was 76 ± 4 years with an age range of 70–86 years. The average prostate volume in this series is 65 g with a maximum prostate size of 110 and a minimum of 40g. 22(53.4%) of the patients had a preoperative indwelling urethral catheter before surgery. The distribution of the indications for surgery is displayed in Figure 1 with the commonest indication for transurethral resection in this cohort of patients being refractory acute urinary retention seen in 15(36.6%) of the patients.

Based on ASA classification, the patients were classified preoperatively as ASA I ASA II, and ASA III in 24.4%, 51.2%, and 24.4%, respectively, while using the Charlson Comorbidity Index, 63.4% had 3 points and 36.5%

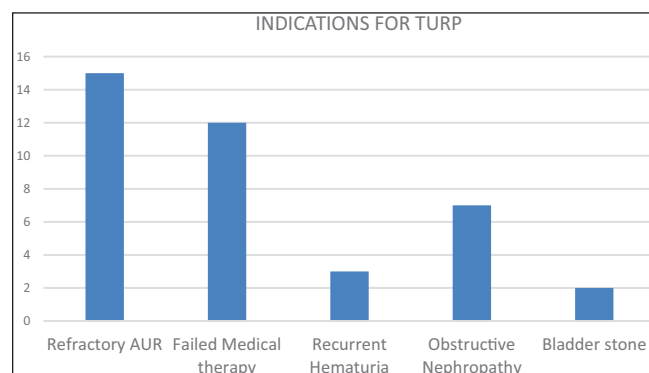


Figure 1: Indications for Transurethral resection of Prostate

had > 3 Points. The distribution of the comorbid conditions is displayed in Figure 2.

Twenty of these patients had early catheter removal while 21 had delayed catheter removal. 6(14.6%) patients who had early catheter removal presented to the emergency department within 30 days post-operative period while

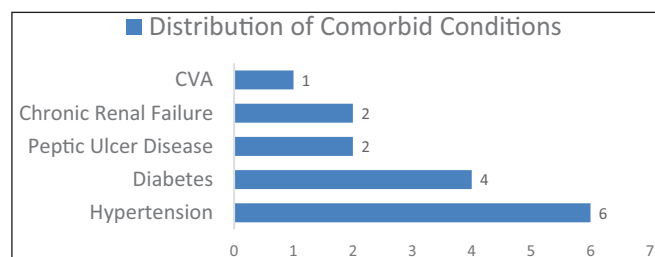


Figure 2: Distribution of comorbid conditions

3(7.3%) of those with delayed catheter removal presented to the emergency department within the 30 days post-operative period. The pie chart in Figure 3 below shows the distribution of the emergency presentation of these patients.

The post-operative catheter duration, prostate size, ASA status, and presence of preoperative indwelling urethral catheter were all not statistically significant determinants of presentation to the emergency department following transurethral resection of the prostate in these elderly patients as analysed in Table 1 using Fischer’s exact test whereas the CCI score was the only statistically significant determinant of emergency presentation in these patients with a $P = 0.006$.

Discussion

Elderly patients are increasingly having safe surgeries due to longer life expectancies as well as improvements

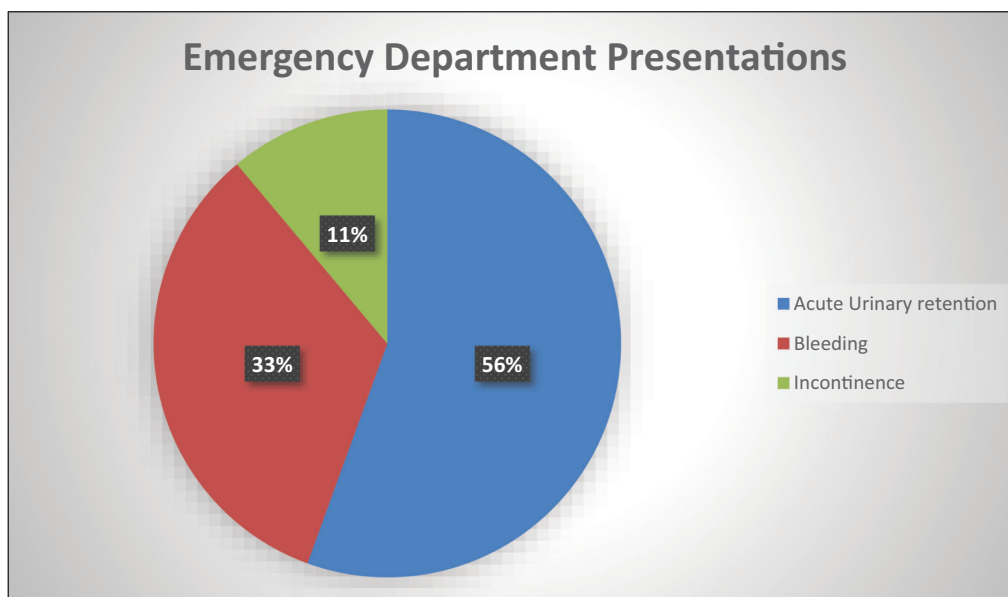


Figure 3: Complications within 30 days of surgery requiring emergency department presentation

Table 1: Analysis of the determinants of emergency department presentations following transurethral resection of the prostate in the elderly men

Variables		Emergency department presentation		P Value
		YES (%)	NO (%)	
Catheter duration	Early (3days)	6 (14.6)	14 (34.1)	0.277
	Delayed (>3days)	3 (7.3)	18 (43.9)	
ASA status	ASA I	2 (4.9)	8 (19.5)	0.364
	ASA II	3 (7.3)	18 (43.9)	
	ASA III	4 (9.8)	6 (14.6)	
Prostate volume	≤40g	1 (2.4)	1 (2.4)	0.421
	40-80g	5 (12.1)	23 (56)	
	>80g	3 (7.3)	8 (19.5)	
Preoperative indwelling catheters	Yes	7(17)	15(36.6)	0.140
	No	2(4.9)	17(41.4)	
Charlson comorbidity index score	3 points	2(4.9)	24(58.5)	0.006
	>3 points	7(17.0)	8(19.5)	

in technologies for minimally invasive surgeries, surgical protocols to minimize metabolic response to trauma, and safe anaesthesia.^[20] Surgery for benign prostatic hyperplasia has significantly improved and found to be safe in the elderly with minimal postoperative morbidities.^[5,6,21] Approximately 21% of the transurethral resection of the prostate done within the study period was on elderly patients. The procedure was done using continuous flow resectoscope and monopolar resection with sterile water as irrigant. Sterile water as the irrigant fluid is safe, associated with clear vision without bubbles during resection, and a cost-effective approach especially in a resource-limited environment.^[22,23]

The decision to remove the post-operative urethral catheter following transurethral resection of the prostate depends largely on when the effluent is clear or pink and also on the surgeon's preference. On the one hand, the surgeon's decision is guided by experience about the outcome of early or delayed removal of the catheter and the drive to reduce hospital stays and the cost of healthcare. In most studies, re-catheterization rates are about 10-12%, which is a composite of both middle and elderly patients.^[24,25] The need for re-catheterization is mostly due to bleeding or urinary retention.^[11,19,24,25] This is similar to our findings in this cohort of 41 elderly patients. In a review of 379 consecutive transurethral resections of the prostate, Reynard *et al.* found 10% presented with an inability to void after catheter removal.^[15] 5(12%) of our patients presented to the emergency department due to the inability to void. Post-operative bleeding after catheter removal following monopolar transurethral resection of the prostate was reported to be about 7.2% by Teng *et al.*^[17] This is similar to our finding of 3(7.3%) patients who presented to the emergency department with post-operative bleeding.

Overall, 21% presented to the emergency department with the need for re-catheterization. In previous age-mixed studies, this is slightly higher than the reported re-catheterization rates following early catheter removal. Thus, the elderly may have a higher risk of re-catheterization following early catheter removal. Similarly, though not statistically significant in this study, amongst patients who presented to the emergency department following discharge from the hospital, a higher rate of 14% had early catheter removal as compared to 7% who had delayed catheter removal while more of the elderly patients who had delayed catheter removal 44% did not present to the emergency department as compared to 34% of those who did not present to the emergency department and had early catheter removal. These findings call for possible caution and patient selection when deciding to remove the catheter early in an elderly patient following transurethral resection of the prostate. Palmisano *et al.* in their review of the incidence and predictors of readmission rates following transurethral resection of the prostate in 160 patients noted that age and Catheterization time were independent predictors of readmission rate.^[19] Furthermore, they also observed a

beneficial effect of longer catheterization times in patients aged 75 and above.

The presence of comorbidities assessed using Charlson's Comorbidity Index was found to be a significant variable in the presentation of this group of patients to the emergency department after surgery. In a population-based study in Canada, Samer and Colleagues found the Charlson Comorbidity index as an independent predictor of readmission after transurethral resection of the prostate.^[16] Similar findings were noted by Hong *et al.*^[26] However, in a retrospective study of transurethral resection of the prostate in 85+ patients in 2022 by Lotterstter *et al.*, the Charlson Comorbidity index was not a predictor of surgical outcome.^[21]

Other possible factors such as preoperative ASA status, prostate volume, and presence of preoperative indwelling catheter reviewed in this study, were not statistically significant factors to predict presentation to the emergency department following transurethral resection of the prostate in this group of elderly patients. A similar finding was documented by Nakagawa *et al.* who demonstrated that these factors were also not statistically significant determinants of complications following either early or delayed catheter removal post transurethral resection of the prostate.^[27]

Conclusion

Monopolar transurethral resection in elderly patients is safe, though presentation to the emergency department after catheter removal should be anticipated more than in younger patients. These patients, especially those with comorbidities should be counselled on the possibility of presentation to the emergency department within a month after surgery due to complications such as bleeding or acute urinary retention. Early catheter removal on the 3rd post-operative day is safe in these patients and not found to be a risk factor for presentation to the emergency department after transurethral resection of the prostate.

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Conflicts of interest

There are no conflicts of interest.

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