

Transurethral Resection of Prostate (TURP) Through The Decades – A Comparison of Results Over the Last Thirty Years in a Single Institution in Asia

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Abstract

Introduction: This study was conducted to evaluate the results and complications of transurethral resection of prostate (TURP) over the last 30 years in our institution. **Materials and Methods:** This retrospective study encompasses 3 different eras: 168 patients in the late 70s, 175 patients in the late 80s and 283 patients in the late 90s. All the patients had at least 18 months of follow-up. **Results:** The mean age from the 1970s, the 1980s and 1999 were 68.8 years, 69.2 years and 69.4 years respectively. The proportion of patients operated on for acute retention fell from 78.6% (132) in the 1970s, to 54% (96) in the 1980s, and 43% (122) in 1999. The mean resection time was 44.8 minutes in 1989 and 41.8 minutes in 1999. The mean weight of prostate resected was 22.1 g in the 1970s, 24.2 g in 1989 and 22.2 g in 1999. 44% (74) required blood transfusion in the 1970s, with 11% (19) in 1989 and 4% (11) in 1999. There were 2 deaths (acute myocardial infarction and pneumonia) in the 1970s, 1 (pneumonia) in 1989 and no mortality in 1999. There were 4 patients with TURP syndrome in the 1970s, 3 in 1989 and 1 in 1999. The incidence of postoperative urinary tract infection (UTI) was 25% (42) in the 1970s, 16% (29) in 1989 and 6% (17) in 1999. **Conclusions:** As expertise and experience in TURP progress, the complication rates fall, as evidenced by the lower rates of transfusion, TURP syndrome and postoperative UTI in the later series.

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Introduction

Over the last 70 years, transurethral resection of prostate (TURP) has been used in the surgical treatment of benign prostatic hyperplasia (BPH) and is still considered the gold standard.^{1,2} With improvements in operative techniques, video endoscopy, anaesthetic care and intraoperative monitoring of fluid and electrolytes, rates of intraoperative and postoperative morbidity and mortality have been greatly reduced.³

Recently, this form of surgery has been challenged by other procedures deemed equally effective but less invasive.⁴⁻¹² Often, reports on such minimally invasive procedures cite transurethral prostatectomy as the gold standard. Unfortunately, the morbidity and mortality data used to compare these minimally invasive procedures to TURP were based on large retrospective reviews in the 1970s and 1980s.^{13,14}

In our department, we have been collating data on surgical outcomes after TURP over the last 3 decades.^{15,16}

This retrospective analysis provides an insight into the evolution of this technique in our institution over the last 30 years.

Materials and Methods

The study involved patients who had TURP over the last 3 decades. For each decade, all the TURPs performed over a 1-year period were reviewed. We used the old results from the first 2 decades and compared them to those collated in 1999. In 1999, the inpatient and outpatient records, operative reports, investigation and histology results and discharge summaries were reviewed. For each patient, 22 data points were collected. Only new BPH cases without previous prostate operations were included. Patients who were suspected of having carcinoma of the prostate because of very high PSA levels or suspicious digital rectal examinations were excluded from this study. This is in accordance with the previous studies so as to achieve some uniformity in the patients' profile.

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All patients had at least 18 months of post-surgical follow-up. In all, the records of 168 patients in the late 70s, 175 patients in the late 80s and 283 patients who underwent TURPs in our institution in 1999 were available for analysis.

The TURPs in the 1970s were done by a single surgeon. The TURPs in the 1980s and 1999 were performed by surgeons with varying amounts of experience in our department, ranging from a junior registrar under the supervision of a specialist to a senior consultant. All the procedures were done with a size 26 F continuous flow resectoscope. In 1999, the majority of cases (79%) were operated on under spinal anaesthesia with standard cardiopulmonary monitoring. Preoperative gentamicin or ceftriaxone and 1.5% glycine for irrigation were administered in almost all cases. The adenoma was resected according to the technique preferred by the attending urologist. The entire resected specimen was weighed and submitted to the pathologist for review. All the patients had an indwelling catheter inserted and continuous bladder washout instituted postoperatively. The duration of urethral catheterisation differed according to individual patients and the preference of the attending surgeon. However, it is common practice for us to remove them early at the moment, usually on the second or third postoperative days. Most of the patients only received paracetamol as an oral analgesia and a stool softener, for 1 week postoperatively.

The parameters that we sought were mean age, comorbidities, indications for TURP, resection time and resected tissue weight, pathological diagnosis, intraoperative complications, whether blood transfusions were given, hospital stay, catheter duration, and early and late postoperative complications. Statistical analysis was performed using the Chi-square test and a $P < 0.01$ was considered significant.

Results

Preoperative Indicators

The mean age of the patients operated on in 1999 was 69.4 years (range, 47 to 90 years). This remained fairly constant over the years; it was 68.8 years in the late 70s and 69.2 years in the late 80s (Table 1). The majority (41.3%) were in the 61 to 70 years age group.

The indications for TURPs that were performed in 1999 are shown in Figure 1. Fifty-one per cent underwent elective TURPs for significant lower urinary tract symptoms (LUTS) only. Forty-three per cent had TURPs because of acute retention of urine (ARU) that had failed a trial without urinary catheter. The other patients either had haematuria or recurrent urinary tract infections. These results contrast sharply to the previous indications for TURPs. As shown in Table 1, there were more TURPs done for acute retention of urine in the 70s; conversely, the elective TURPs that were performed because of worsening LUTS increased over the years. There were 14.8% of TURPs that required a concomitant removal of bladder calculi in 1999 as compared to about 10% of all TURPs in the 1970s and 1980s. The majority of them were retrieved endoscopically, with only 1 open vesicolithotomy done because of a large 5-cm bladder stone. Currently, most of the bladder stones are removed via endoscopic means. Interestingly, there were 13 patients (4.6%) who had bilateral hydronephrosis due to chronic retention.

Intraoperative Assessments

Seventy-nine per cent of the TURPs were performed under regional anaesthesia and 66% of the patients received preoperative antibiotics. The mean resection time was almost the same, from 44.8 minutes in the 1980s to 41.8 minutes in 1999. The average weight of resected prostatic tissue remained fairly constant over the years: 22.1 g in the

Table 1. Comparison of Transurethral Resections of Prostate Done in the Different Eras

Series	1970s (%)	1980s (%)	1999 (%)
Indications			
Number of patients	168	175	283
Average age (y)	68.8	69.2	69.4
Acute retention of urine*	132 (79)	96 (54)	122 (43)
Haematuria	11 (6.5)	19 (10)	14 (5)
Bladder calculi operation	18 (10.7)	19 (10)	42 (14.8)
Average resection time (min)	NA	44.8	41.8
Average resected weight (g)	22.1	24.2	22.2
Transfusion rate*	74 (44)	19 (11)	11 (4)
Mortality	2	1	0
Discharge by 5 th postoperative day*	72 (42.9)	131(75)	272 (94)
Urethral stricture/bladder neck contractures	8 (5)	10 (6)	16 (6)

* $P < 0.005$ (1970s vs 1980s vs 1999)

NA: not available

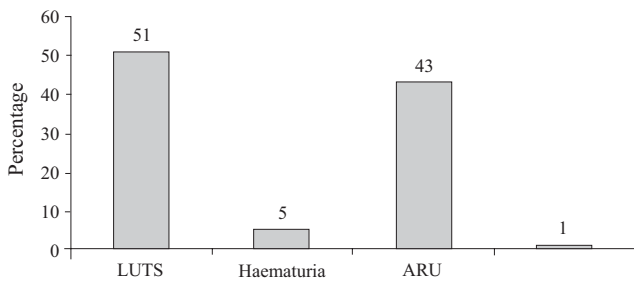


Fig. 1. Indications for transurethral resection of prostate in 1999. (ARU: acute retention of urine; LUTS: lower urinary tract symptoms; UTI: urinary tract infection)

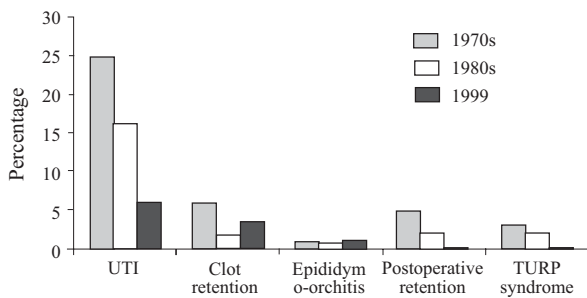


Fig. 2. Postoperative complications. (TURP: transurethral resection of prostate; UTI: urinary tract infection)

70s, 24.2 g in the 80s and 22.2 g in 1999. The transfusion rate had steadily decreased over the decades, from 44% of TURPs requiring blood transfusions in the 70s series, to 11% in the 80s series. There were 11 patients (4%) who needed blood transfusions in 1999 (Table 1). Ten of them required only 1 unit of blood because of severe haematuria post-TURP. The last patient needed 2 units because he developed a bleeding gastric ulcer post-operation for which endoscopic therapy was required.

Ninety-five per cent of the surgical specimens were benign in 1999, with 19% having some foci of prostatitis. Of the 13 patients with adenocarcinoma, 2 of them subsequently underwent a radical retropubic prostatectomy, while 10 had either surgical or medical castration. One patient with a small focus of Gleason 2 + 2 was treated conservatively with watchful waiting in view of his age. Two patients had associated high grade PIN and are still under follow-up with us.

Postoperative Evaluation

Average postoperative hospital stay and average indwelling urethral catheter time decreased significantly over the years, with 94% discharged by the fifth postoperative day in 1999. This is in contrast to previous results in the 1970s and 1980s with only 42.9% and 75% discharged by the fifth postoperative day respectively.

There was 1 bladder perforation in the 1970s series. There was no bladder perforation during TURP in the 1980s and 1999. The most common postoperative complication was urinary tract infections, which occurred in 6% of patients in 1999. This is a sharp decrease from 25% in the 70s and 16% in the 1980s. Of the 17 patients with postoperative urinary tract infections in 1999, 11 had either positive urine or blood cultures (Fig. 2). The number of patients requiring a repeat TURP because of a failed trial without catheter was significantly reduced. There were 10 patients (3.5%) who needed to return to theatre for cystodiathermy because of postoperative haematuria with clot retention. This figure remained stable over the years. Only 1 patient developed postoperative TURP syndrome in 1999, as opposed to 4 in the 1970s series and 3 in the 1980s series. He was 68 years old with underlying diabetes mellitus, hypertension and ischaemic heart disease. Fifty grams of prostatic tissue was resected over 90 minutes. He developed a possible fit while being monitored in the recovery area prior to being transferred back to the ward. He was re-intubated and sent to the intensive care unit for a day. The serum sodium post-operation was low at 124 $\mu\text{mol/L}$. He recovered fully with no neurological deficit.

Other non-TURP-related postoperative complications included a wound infection from the only open vesicolithotomy case as well as a patient who was hypotensive with angina and was treated conservatively after consultation with the cardiologist. One patient developed a bleeding gastric ulcer after TURP while another elderly man suffered a cerebrovascular accident which was complicated with nosocomial pneumonia. He was discharged after 35 days of hospitalisation.

The mortality rate had been low since we started using TURP for surgical management of our patients with BPH. There were 2 deaths in the 1970s data and 1 in the 1980s. These patients were over 70 years of age and had multiple medical problems. There was no mortality in 1999 and this could be attributed to improved techniques of TURP and better anaesthetic care.

Upon follow-up, there were 5 patients who were not traceable. Of the remaining 278 patients, 4 had a repeat TURP because of recurrent adenoma, usually 1 year after the initial TURP. Six needed a bladder neck incision for bladder neck contractures. Another 10 had dilatation under local anaesthesia because of urethral stricture. These were all short and soft strictures which did not recur after 1 or 2 dilatations.

Discussion

Based on the results of TURP in 1999, the average age of our patients (69 years) and resection time are comparable to other series.^{17,18} Compared to overseas series, there are

relatively fewer TURPs performed because of bothersome symptoms in our series despite an increasing awareness about BPH, easy access to medical care, and the widespread use of effective pharmacological agents. For example, according to Borboroglu et al,¹⁸ 81% of their TURPs were done for symptomatic LUTS and 15% because of ARU. On the other hand, only 51% of our TURPs were done for symptomatic LUTS and as many as 43% were operated on for ARU. However, the pattern of presentation has definitely changed over the last 3 decades in our institution with fewer patients undergoing TURP for acute retention of urine.

There are still 4.6% of patients that presented initially with associated bilateral hydronephrosis, which is similar to a previous prospective study.¹⁹ In our local context, we have to be vigilant in looking out for this group of patients who would develop residual urine but minimal symptoms with regard to their BPH.

Our combined intraoperative and early postoperative complications of 13.4% is comparable to other series, bearing in mind that the surgeons involved in the latest series ranged from registrars to senior consultants. The main early postoperative complication is still urinary tract infections, which fell from 25% in the 1970s and 16% in the 1980s to 6% in 1999. It is now routine for us to give antibiotic prophylaxis and to ensure a sterile urine culture prior to operation. With these measures, the urinary tract infection rate will decrease even further. Also, with refinements in the skills and equipment for TURP, the need for a repeat resection has decreased. In 1999, there was only 1 patient who had a remnant apical lobe that was later resected, while in the 1970s and the 1980s, there were 8 and 3 respectively. This improvement in the TURP technique is also reflected in the lower transfusion rate in 1999 as compared to previous years.

The duration of postoperative hospitalisation and indwelling urethral catheterisation have been significantly reduced over the last 3 decades. The percentage of patients discharged by the fifth postoperative day increased from 42.9 in the 1970s, to 75 in the 1980s and 95 in 1999. Five per cent were discharged with an indwelling catheter after a failed trial without catheter. All the patients in the latter group were eventually weaned off their urinary catheters.

The overall late complication rate of urethral stricture and bladder neck contracture of 6% is similar to other major series. This figure has remained relatively stable over the decades. Ironically, with better equipment, improved technique and better postoperative care, this rate should be reduced. One of the possible explanations could be that the availability of flexible cystoscopy has allowed us to diagnose urethral strictures more readily. It could also be that surgeons

with various experience in TURP are involved in the later studies. Overzealous resection of small prostate gland by less experienced urologist, whereby a transurethral incision of prostate would suffice, resulted in the formation of bladder neck contracture.

The incidences of postoperative retrograde ejaculation and erectile dysfunction were not determined in our study because most patients did not complain of such problems then. However, with better understanding, and acceptance of such complaints as medical conditions nowadays, it would be interesting to analyse such incidences.

Lastly, there are multiple studies comparing TURP and other “less invasive” therapeutic options such as microwave therapy, needle ablation and high intensity frequency ultrasound.⁴⁻⁸ Other studies have attempted to employ new energy sources such as Nd-Yag laser, Holmium laser or bipolar Plasmakinetic technology.⁹⁻¹² These studies reported mainly short-term results and showed that the “less invasive” surgical options offered less morbidity, shorter duration of the procedure and earlier discharge from hospital. However, longer follow up in some studies^{4,20,21} showed that there is a higher re-operation rate for those who underwent “less invasive” treatments. This underscores the fact that TURP is still relevant in the present situation.

A promising alternative would be the Holmium laser as it results in near complete removal of prostatic tissue and is comparable to TURP. The problem is that the equipment is costly. Another viable option would be the Plasmakinetic bipolar technology, which vapourises the prostatic tissue. The clinical outcome has been encouraging as it causes less bleeding, and because it uses saline instead of glycine for irrigation and there is a lower risk of TURP syndrome. In fact, it has allowed TURP to be done as a day case.²²

Conclusion

With new therapies currently undergoing intensive investigations, it is prudent for us to understand the contemporary morbidity and mortality rates of TURP. There have been significant improvements in the morbidity rate, perioperative blood transfusion rate and recurrence rate. Significant reductions in the duration of urethral catheterisation and hospitalisation stays have been made as well. These data may help urologists and patients decide which form of treatment to choose after conservative therapies for symptomatic BPH fail.

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