

TRANSURETHRAL RESECTION FOR BENIGN HYPERPLASIA OF THE PROSTATE: ANALYSIS OF 1513 CONSECUTIVE CASES*

*Doğan Remzi MD***, *İlhan Erkan MD****, *Haluk Özen MD*****,
*Cevat Koçal MD***

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Obstructive uropathy in elderly men, which is mostly secondary to benign hyperplasia of the prostate, requires surgical management. The hyperplastic gland may be removed either transurethrally or by means of a classical open operation. Although transurethral prostatectomy (TURP) has been widely used in Europe and the USA for more than 50 years, in Turkey TURP has been performed only since the establishment of our department within the Hacettepe Faculty of Medicine in 1963.

Here we present the 20 years of our experience with TURP on 1513 patients and we shall try to discuss the factors that influence the mortality and morbidity of this specific operation.

Material and Methods

1513 transurethral resections for benign hyperplasia of the prostate have been performed in our department over the last 20 years.

Hospital records and outpatient charts were examined for follow-up data. Sufficient accurate information was only available for 924 patients, and it is with this group that this paper deals. The records of these 924 patients were reviewed by a single investigator (H.Ö.), in order to be as accurate and informative as possible.

The patients ranged in age from 47 to 96 years, the average being 62.3 ± 2.4 years.

After hospitalization and prior to surgery, a general physical examination, urine analysis, urine culture, renal and liver function tests, chest X-ray, ECG excretory urograms and cystourethroscopy were performed. A urethral catheter was inserted

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- * From the Department of Urology, Hacettepe University Faculty of Medicine, Ankara.
 - ** Professor of Urology, Hacettepe University Faculty of Medicine.
 - *** Associate Professor of Urology, Hacettepe University Faculty of Medicine.
 - **** Lecturer in Urology, Hacettepe University Faculty of Medicine.

in cases of urinary retention or of postvoiding residual urine of more than 100 milliliters. Specific antibiotics were administered to patients with a urinary tract infection confirmed by urine culture. Transurethral resections were routinely performed via the external urethral meatus and a 28 F Stern McCarthy resectoscope sheath was used. Postoperative urinary drainage was accomplished by means of an 18 - 20 F Foley catheter; in most of the cases this was used for 3 days.

Hospital stay in this study is arbitrarily defined as the time between the operation day and the day when the patient voids spontaneously after removal of the catheter. Again for this paper the azotemic patient is defined as one whose serum creatinine level is equal to, or above, 2.0 mg/dl.

Results

The resected tissue weighed between 5 and 110 grams while operations lasted between 5 and 85 minutes. The mean resected tissue weight per operation was found to be 20.81 ± 3.71 grams and the mean amount of tissue resected per minute was 0.60 ± 0.09 grams.

Operative Mortality

The overall mortality rate in our group was determined as 1.94%. The causes of deaths occurring in the first 4 weeks after the operation are listed in Table I. The most common cause of death in our group was septicemia.

TABLE I
Mortality

	Number of patients	%
Sepsis	6	35.33
Myocardial infarction	4	23.52
TUR syndrome	3	17.66
Gastrointestinal bleeding	2	11.76
Pulmonary emboli	2	11.76
Acute renal failure	1	5.88

Morbidity

In the entire series, 17.5% of the 924 patients experienced some type of non-fatal complication. The recovery of the remaining 80.56% of the patients was uneventful. Table II lists the non-fatal complications seen in our group in order of decreasing

frequency. For purposes of clarity, each complication will be discussed separately and influencing factors, if detected, will be analyzed.

a) *Epididymitis*. The incidence of this complication was determined to be 5.19%. Vas ligation was not carried out as a routine procedure. Of the 48 patients who experienced epididymitis postoperatively, 22 had had a urinary catheter inserted preoperatively and in 26 cases a urethral catheter had been introduced immediately after the operation.

b) *Secondary resection*. 3.6% of the patients required a second TURP for the relief of recurrent obstruction. Most of these patients returned for medical care during the first postoperative year.

c) *Urethral stricture*. Urethral stricture following TURP was seen in 2.48% of the patients in our group. TURP was not performed through a perineal urethrostomy in any of our patients.

d) *TUR syndrome*. Patients with serum sodium levels below 125 mEq/L postoperatively were regarded as having the TUR syndrome. Based on this criterion 20 patients (2.16%) in our group experienced this complication.

e) *Hematuria*. First of all, the average blood loss during this specific operation was found to be 256.70 ± 137.11 milliliters, and the blood loss per gram of resected tissue was found to be 10.11 milliliters. The 2.16% of the cases shown in Table II are those who required conservative or surgical measures to control postoperative hemorrhage.

f) *Incontinence*. Permanent and serious incontinence was noted in 1.17% of our patients. Predictably, there were many other patients who experienced transient

TABLE II
Non-fatal Complications

	<u>Occurrence (%)</u>
Epididymitis	5.19
Secondary resection	3.60
Urethral stricture	2.48
TUR syndrome	2.16
Gross hematuria (Early-late)	2.16
Incontinence	1.17
Bladder perforation	0.75

incontinence in the early postoperative period; this was managed by conservative means.

Hospital stay

The mean hospitalization period in our group was found to be 4.88 ± 1.3 days.

Follow-up

The follow-up period ranged from 6 months to 9 years, with an average of 4.2 years.

Factors Affecting Mortality and Morbidity

a) *Gland size.* The relationship between the amount of resected tissue in grams, and mortality and morbidity, is shown in Figure 1. The mortality rate in patients with

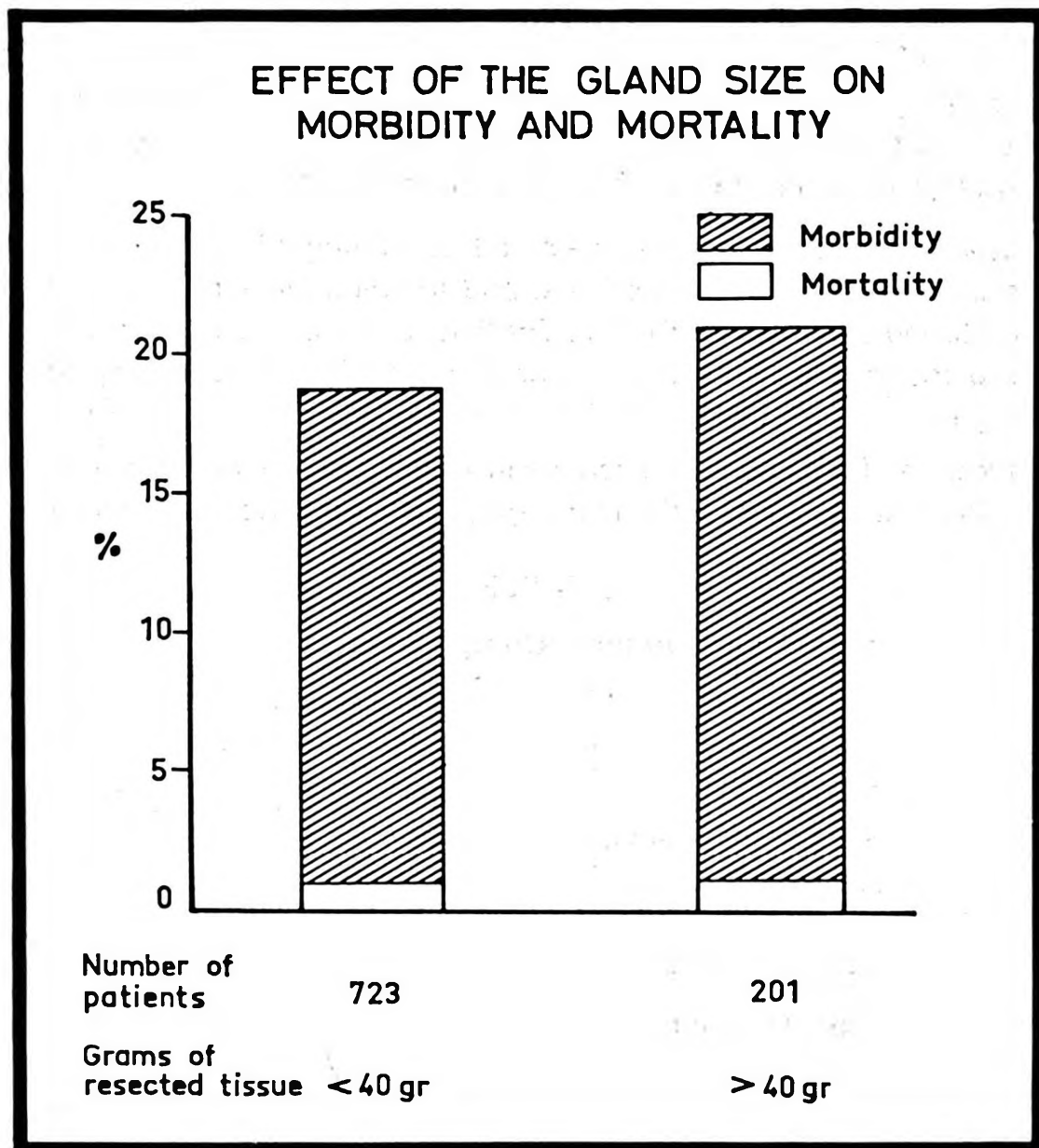


Figure 1

resections of less than 40 grams was 1.9% while this rate for glands of more than 40 grams was 2.2%. Morbidity rates for glands of less than 40 grams and of more than 40 grams were 16.9% and 18.7%, respectively.

b) *Operation time.* Operations were divided into 3 groups arbitrarily, as operations lasting less than 20 minutes, 20 to 40 minutes and more than 40 minutes. Mortality rates of these groups were similar, but morbidity rates seemed to increase as the operation was prolonged (Figure 2).

c) *Azotemia.* Figure 3 compares the mortality and morbidity rates of patients with normal renal function with those of azotemic patients. The differences in mortality and morbidity were found to be significant. There was roughly a fivefold increase in

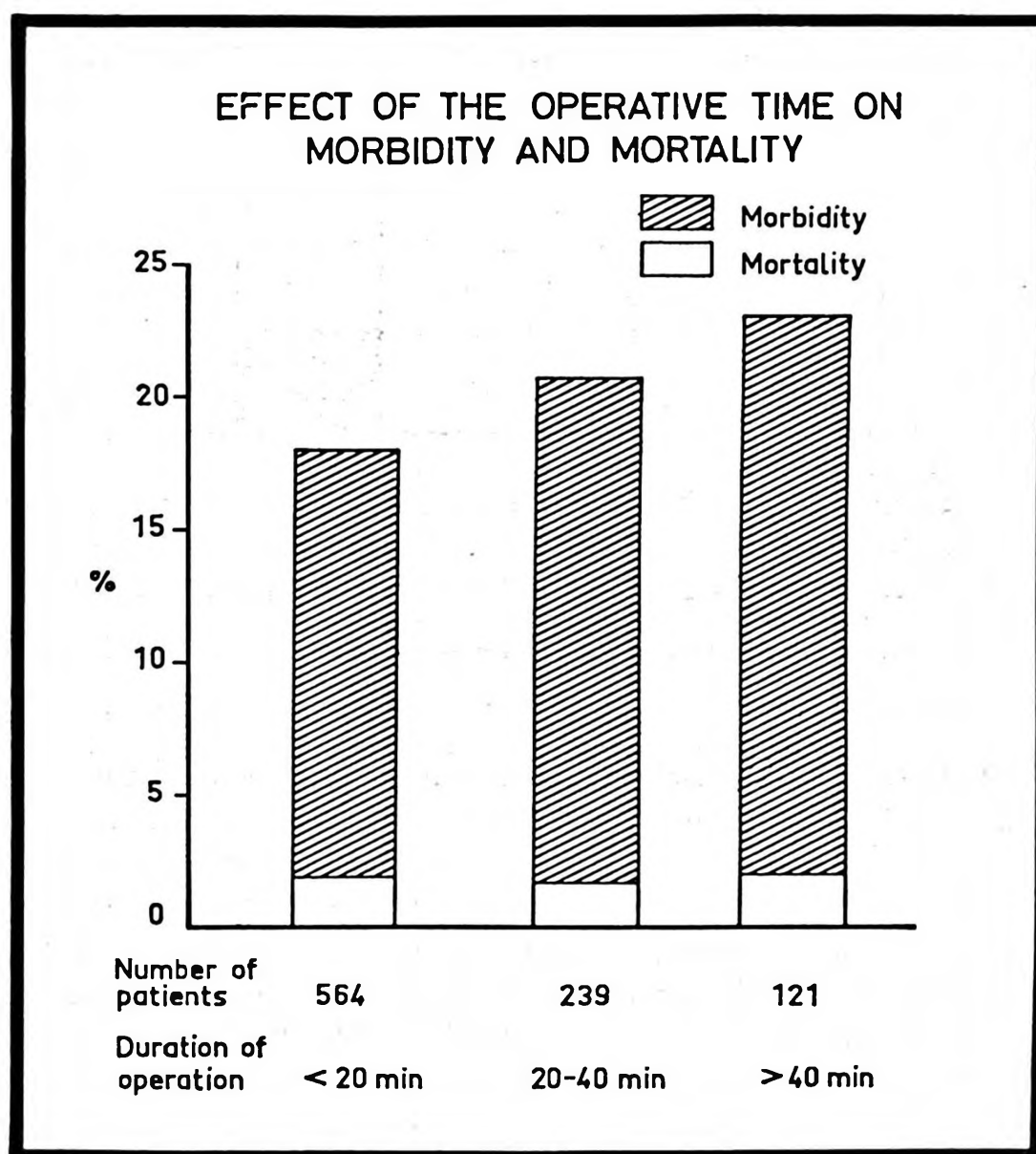


Figure 2

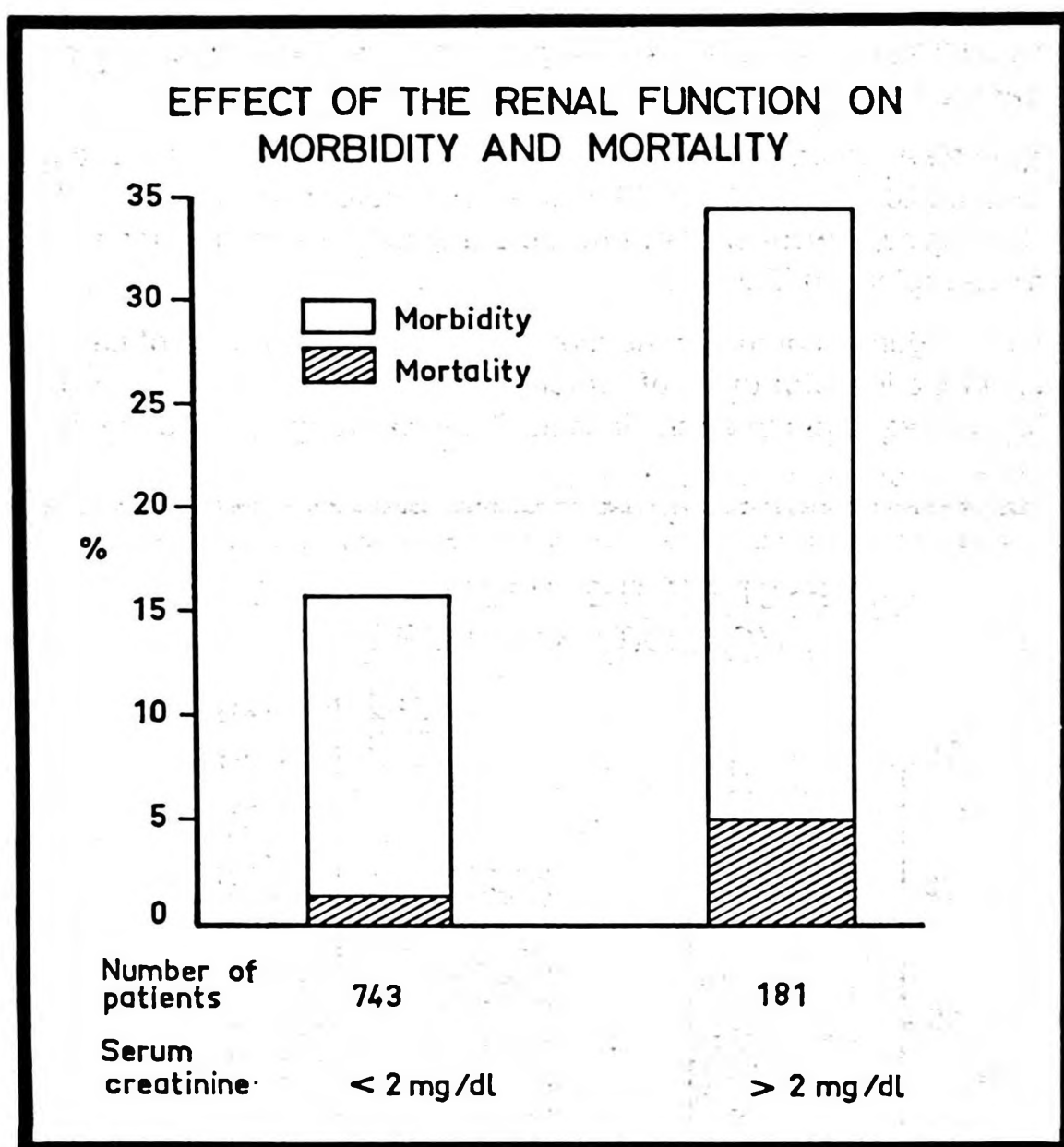


Figure 3

mortality and a two fold increase in morbidity in azotemic patients as can be seen in the figure.

Discussion

The technique of transurethral prostatectomy was developed in the 1930's in the USA and accepted as a useful operation in the early 1940's in the same country. Now it is the method of choice in more than 80 - 90% of patients suffering from prostatism¹.

An evaluation of our 20 years of experience of TURP in the treatment of benign hyperplasia of the prostate in 1513 patients is presented in this study. Our mortality rate was found to be 1.94%, which is quite comparable to figures reported from

various clinics throughout the world^{1,5}. Although most of the teaching departments have reported their mortality figures separately as staff mortality and resident mortality, sufficient data were not available in our hospital records for such a report.

Apart from the patients who died, 17.5% experienced some type of non-fatal complications, and the remaining 80.56% recovered uneventfully.

Epididymitis was the most commonly encountered non-fatal complication in our study, with a rate of 5.19%. Postoperative epididymitis following transurethral resection has been reported to have an incidence of 0 to 13.5%⁶. This complication may be reduced significantly by prophylactic vas ligation, but this was not performed on any of the patients in our study owing to the legal problems connected with it in our country. Interestingly enough, in this study epididymitis was more commonly seen in patients who had had no urethral catheter preoperatively. This finding is contrary to the results of Melchior's study, in which epididymitis was more commonly seen in patients who presented with urinary retention⁶.

In 3.6% of the cases, a secondary operation for obstruction was required; furthermore 69.93% of these required a subsequent TURP in the first postoperative year. Elsewhere the need for a second operation in a series of 2015 patients was reported as 3.4%³. Our figure for this complication was considerably higher than the figure reported by Melchior et al, who estimated this complication as occurring in 0.9%⁷.

The incidence of urethral stricture following TURP in our study was 2.48%. This is within the rates reported by other authors^{8,12} which range from less than 1% to 8%.

The incidence of TUR syndrome, i.e. absorption of isotonic fluid with secondary hyponatremia, was found to be 2.16% in our study. This rate is higher than had been reported previously (0.4% in a study of 2015 cases³ and 0.9% in another extensive study⁷), and in our group the mortality rate of those patients with the TUR syndrome was also high (15%). In the other two series sterile 1.5% glycine had been used as the irrigating fluid, which clearly shows that we should substitute the glycine solution for the distilled water used for our patients.

The operative blood loss per gram of resected tissue in our group was found to be 10.11 milliliters. When the literature is examined on this point we find that blood loss per gram of resected tissue varies between 1.9 and 22.2 milliliters, but operative blood loss may be reduced significantly if a continuous irrigation resectoscope is used^{13,14}.

As seen in Figure 3 there is a twofold increase in morbidity and an almost fivefold increase in mortality in patients who had serum creatinine values equal to or greater than 2 mg/dl. This finding is fairly constant in various studies dealing with the contributing factors that affect the morbidity and mortality rates^{2, 3, 7}. However, neither the size of the gland nor the resection time seem to effect significantly the

mortality and morbidity rates in our study; these findings suggest that continued adherence to the traditional concept of a one-hour limit in resection time is unnecessary.

Summary

This is a study of 1513 transurethral resections for benign hyperplasia of the prostate carried out by the Department of Urology of Hacettepe University since 1965. The surgical technique is described, and facts and figures concerning the patients, the non-fatal complications and the mortality rate are given.

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