Original article

The influence of histological diagnosis on the postoperative complication rate following trans-urethral resection of prostate (TURP)

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Background: A number of studies have shown that the early mortality following TURP is higher for patients with prostate cancer than those with benign disease. This study examines the effect of the histological diagnosis on the predischARGE complication rate following TURP.

Methods: Information on the postoperative, predischARGE complications of 3036 patients, who underwent TURP over the last decade at our institution, was collated from the urology department database (AuditBase™ for Windows). The information on this database is collected prospectively, at the point of care and validated at monthly audit meetings. Statistical analyses were performed using χ^2 and difference of proportion where $n > 60$. Statistical significance was taken as $P < 0.05$.

Results: The postoperative, predischARGE major complication rate for patients with benign disease was 2.1%. This was not statistically different from the 2.3% complication rate seen in patients with malignant disease. Patients suffering a postoperative complication stayed in hospital significantly longer than those who had a straightforward postoperative course ($P < 0.001$); however, patients with malignant histology suffering a postoperative complication did not stay statistically significantly longer than those with benign histology suffering a postoperative complication ($P < 0.1$).

Conclusions: Patients undergoing TURP for prostate cancer do not suffer more postoperative, predischARGE complications or stay in hospital longer than patients undergoing TURP for benign disease.

Key words: TURP – Prostate cancer – BPH – Morbidity – Mortality

Trans-urethral resection of the prostate (TURP) is accepted as the gold standard procedure for men requiring operative treatment for bladder outflow obstruction (BOO) secondary to benign prostatic hyperplasia (BPH).¹ Recent studies, carried out both in the UK and the US, have shown the early mortality, defined as death prior to discharge or within 30 days of the procedure, following TURP to range between 0.2% and 3.0%.^{2–4}

TURP is also performed for men with BOO associated with prostate cancer. These patients can be separated into two groups: (i) men with known prostate cancer requiring a TURP to relieve obstruction; and (ii) men in whom prostate cancer is found incidentally on histological examination of the prostatic chips. Patients with prostate cancer undergoing TURP have been shown to have an early mortality 3–10 times greater than those patients

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Figure 1 Breakdown of patients by ASA grade.

undergoing TURP for benign disease.^{3,5} Some urologists have suggested that the non-fatal complication rate is also likely to be higher following TURP for malignant prostates. The aim of this study was to compare the postoperative, pre-discharge complications seen in patients undergoing TURP for BPH with those seen in patients with histologically proven prostate cancer.

Patients and Methods

Information on a consecutive cohort of 3036 patients undergoing a primary TURP at Gloucestershire Royal Hospital between July 1991 and September 2000 was accessed from the departmental database (AuditBase™ for Windows). OPCS4 codes M65.1 and M65.8 were used to identify the relevant procedures. Bladder neck incision was not included.

Information on AuditBase™ was prospectively collected, at the point of care, by capture of data when the operation note and discharge summary were created. Complications during hospital stay were recorded in the discharge summary. Patients re-admitted with complications had the details recorded in the original discharge summary relating to the primary operation. Complications were categorised as 'major' or 'minor'. In order to minimize interobserver

Figure 2 Number of procedures (TURP) performed in each year.

variation in the reporting of postoperative complications, junior doctors preparing the discharge summaries were provided with definitions of complications. All morbidity and mortality data were peer-reviewed and verified at monthly, county-wide audit meetings. Operations were performed under the care of two full-time, one part-time and one locum consultant urological surgeon over the 10 years. Overall, 12 surgeons (4 consultants and 8 trainees) performed the procedures. Resection was performed with conventional, continuous flow resectoscopes. Patients received routine single dose antibiotic prophylaxis after induction of anaesthesia. Prophylactic heparin was not used except for high-risk patients. Of the patients, 78% had a spinal anaesthetic.

Statistical analyses were performed using χ^2 and difference of proportion where $n > 60$. Statistical significance was taken as $P < 0.05$.

Results

The median age of the patients was 72 years (range, 46–92 years). The majority of patients were in the American Society of Anesthetists (ASA) classification groups 1–3 with 0.5% in group 4 and none in the moribund category 5 (Fig. 1). The year-on-year trend in the number of procedures performed is shown in Figure 2, with a peak of 500 seen in 1994 and steady decline subsequently.

The histology of the resected prostatic tissue was classified into 3 distinct groups: benign, malignant and

Table 1 Postoperative complications seen in each histological group

	A	B		Difference in proportion (A versus B)	Confidence interval	χ^2	P
	Benign	T1a	Malignant				
No complication	2132 (87.5%)	63 (95.5%)	459 (86%)				
Major complication	50 (2.1%)	0	14 (2.6%)	0.003	–0.01 to 0.02	0.19	< 0.5
Minor complication	254 (10.4%)	3 (4.5%)	61 (11.4%)	0.003	–0.02 to 0.03	0.04	< 0.5
Total	2436	66	534				

Table 2 Major postoperative complications

Major complication	Patients (n)	Incidence of complication (%)
Haemorrhage	15	0.5
Septicaemia	10	0.3
Death	7	0.2
Clot retention	5	0.2
Secondary haemorrhage	5	0.2
Myocardial infarction	3	0.1
Capsular perforation	2	0.1
Shock	2	0.1
Other	15	0.5

microscopic malignancy. The latter group consisted of men in whom foci of prostate cancer were found in a clinically benign gland (T1a category on the TNM classification). In the study group, 2436 men (80%) had benign disease, 534 (17.5%) had malignant disease and 66 (2.5%) had focal, low volume, microscopic malignancy shown on histological examination.

The numbers of major and minor complications seen in each of these histological groups is shown in Table 1. Chi-squared statistical analysis showed no statistically significant difference between the number of complications seen in each histological group. In total, 383 (12.6%) men suffered a postoperative, predischage complication. Of the complications, 318 (83.2%) were minor and 64 (16.8%) were major. There were 7 deaths (0.2%), 4 in patients with benign disease and 3 in patients with malignant disease. Haemorrhage (0.5%) and septicaemia (0.3%) were the commonest major complications (Table 2). Postoperative pyrexia, prolonging hospital stay, was the most common minor complication and occurred in 2.7% of patients (Table 3). The urinary tract infection rate was 1.8%.

The mean length of hospital stay for patients suffering a postoperative, predischage complication is statistically significantly longer ($P < 0.001$) than in patients who made a straightforward recovery (Table 4). Table 5 shows the numbers of complications seen in each histological group and relates this to hospital stay. The microscopic malignancy group is included under the malignancy classification in Table 5, as the small numbers of complications seen in the microscopic malignancy group makes separate analysis meaningless. If major and minor complications are taken together, there is no statistically significant difference in the mean length of hospital stay between the benign and malignant groups ($P < 0.1$). If, however, complications are broken down into major and minor categories, it can be seen that a patient with malignant histology suffering a major complication had a significantly longer mean hospital stay than a patient with benign disease suffering a major complication ($P < 0.05$).

Table 3 Minor postoperative complications

Minor complication	Patients (n)	Incidence of complication (%)
Pyrexia delaying discharge	81	2.7
Acute urinary retention	56	1.8
Urinary tract infection	56	1.8
Haematuria	29	0.9
Clot retention	14	0.5
Spinal headache	8	0.3
Capsular perforation	6	0.2
Postoperative incontinence	6	0.2
Chest infection	5	0.2
Epididymo-orchitis	4	0.1
Cardiac arrhythmia	4	0.1
Drug reaction	3	0.1
Myocardial ischaemia	3	0.1
Other	45	1.5

Table 4 Length of hospital stay (LOHS) related to postoperative complications

	No postop. comp.	Postop comp.	P value
Mean LOHS in days (SD)	5.49 (4.9)	8.10 (4.3)	< 0.001
Median LOHS in days	4	7	

Postop. comp. = Postoperative complications

The mean length of hospital stay has shown a steady decline over the period examined (Fig. 3); however, the number of major complications has shown a small increase (Fig. 4). This increase in major complications is not readily explained by a decline in the general fitness of the patient population, as there was no correlation between the numbers of patients seen in ASA categories 3 and 4 and the major complication rate over time.

Discussion

The results of this large series collected over the last decade compare favourably with other studies in the recent literature.¹⁻⁴ In this institution, we have shown TURP to

Table 5 Mean length of hospital stay (LOHS) related to histology and postoperative complications

	Benign Mean LOHS in days (SD)	Malignant Mean LOHS in days (SD)	P value
No complication	5.42 (4.8)	5.78 (5.2)	< 0.3
Major complication	7.66 (4.2)	13.2 (9.65)	< 0.05
Minor complication	7.96 (5.2)	7.9 (5.49)	< 0.5
Total	5.73 (4.9)	6.2 (5.5)	< 0.01

Figure 3 Mean length of hospital stay by year.

Figure 4 Percentage of patients suffering postoperative major complications.

have low mortality (0.2%) and low levels of predischarge major morbidity in the cohort as a whole. No statistically significant difference was found between the numbers of postoperative, predischarge complications seen in patients with malignant as opposed to benign disease.

In patients who suffered postoperative, predischarge complications as a whole, the histological diagnosis had no influence on the mean length of hospital stay. It was true, however, that patients with malignant disease suffering a major complication stayed in hospital significantly longer than those with benign disease suffering a major complication.

Our minor complication rate may seem high, but includes patients having pyrexia if this was considered to delay discharge. In general, complications rates appear to be higher where data are collected prospectively.

All data included in this study pertain to the predischarge period, no comment can be made as to the patients' progress after they returned home, unless they were readmitted to hospital. It is well recognised that much postoperative morbidity, particularly urinary tract infection, is diagnosed after discharge. Our low rate of urinary tract infection before discharge, probably reflects on the use of single-shot antibiotic prophylaxis.

Conclusions

This study of more than 3000 men undergoing TURP did not find prostatic malignancy to be associated with an excess of postoperative complications. The postoperative mortality rate for patients with prostate cancer was low at 0.5%.

Patients with prostate cancer, whose outflow obstruction indicates surgical intervention and who are fit for surgery, should not be refused a procedure on the basis of the histological diagnosis.

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