

## THE OUTCOME OF SUPRAPUBIC PROSTATECTOMY: A CONTEMPORARY SERIES IN THE DEVELOPING WORLD

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**ABSTRACT—Objectives.** To assess the appropriateness of the technique of suprapubic prostatectomy using a removable bladder neck partition suture for use in a developing world hospital and to provide contemporary open prostatectomy outcome data currently lacking in the world's literature.

**Methods.** From 1984 to 1994, 240 consecutive patients presenting to a developing world hospital with acute urinary retention underwent suprapubic prostatectomy using a removable bladder neck partition suture. The average length of time from bladder decompression until operation was 2.5 months. The outcome of these cases was retrospectively analyzed.

**Results.** The overall early complication rate was 19.6%. There were no deaths. The transfusion rate was 4.6%. Clot retention occurred in 6.7%, and 2.9% required return to the operating room for evaluation. For the second half of the series, the early complication rate decreased to 8.3%, the clot retention rate to 0.8%, and the transfusion rate to 1.7%. Other early and late complications were minimal. The length of delay from decompression until operation did not affect outcome.

**Conclusions.** The technique of suprapubic prostatectomy using a removable bladder neck partition suture is appropriate for use in developing world hospitals because of its low morbidity and mortality rates. The outcome in this contemporary series of open prostatectomy cases compares favorably with the outcome from reported contemporary transurethral resection of the prostate (TURP) series. These data demonstrate that suprapubic prostatectomy is an acceptable option when the patient's anatomy or the state of local medical facilities precludes TURP. *UROLOGY*® 46: 40-44, 1995.

Urinary bladder outlet obstruction secondary to benign prostatic hyperplasia (BPH) is a common problem in the sub-Saharan region of Africa. Patients do not usually present for treatment until they have acute urinary retention, even though they have had diminishing caliber and strength of the urinary stream for months. After the urinary retention is relieved with an indwelling catheter, appropriate definitive treatment for the bladder outlet obstruction must be selected. Although medical therapy for BPH is widely used in industrialized countries, surgery and watchful waiting are the accepted treatment modalities in the developing world. In developed centers with appropriate technology and expertise, at least 90% of prostatic resections can be accomplished by transurethral resection of the prostate (TURP),<sup>1,2</sup> but in those

centers without endoscopic technology and expertise appropriate for TURP, open prostatectomy by suprapubic or retropubic enucleation remains the treatment of choice. Despite the popularity of TURP worldwide, open prostatectomy produces equivalent if not superior symptomatic improvement with a lower reoperation rate.<sup>3-5</sup> Moreover, TURP may be associated with delayed mortality effects not apparent with open prostatectomy.<sup>6</sup>

Unfortunately, modern outcome data for open prostatectomy are lacking in the literature. The clinical series that are relied on in outcome analyses, such as that used for the Agency for Health Care Policy and Research (AHCPR) Guideline process, are often more than 15 years old.<sup>3</sup> For example, the transfusion rate for open prostatectomy identified in the AHCPR BPH Guideline review was excessive by modern standards.<sup>3</sup> Lack of contemporary series of open prostatectomies prevents a truly unbiased review of the relative outcomes of open prostatectomy and TURP, and it is unlikely that these techniques will be tested "head-to-head" in a randomized fashion in the future. Herein, we present the outcome of a series of consecutive suprapubic prostatectomies performed in the sub-Saharan region of Africa. These data demonstrate that

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suprapubic prostatectomy can be safely performed in developing countries by adequately trained surgeons who lack the endoscopic equipment or training to perform TURP. These data also contribute contemporary open prostatectomy outcome data currently lacking in the world's literature.

#### MATERIAL AND METHODS

This is a retrospective analysis of 240 consecutive patients presenting with acute urinary retention and undergoing suprapubic transvesical prostate enucleation using the Malement<sup>7</sup> removable partition suture at Baptist Medical Centre, Ogbomosho, Nigeria, between October 1984 and March 1994. The Malement technique was introduced into our hospital by a urologist (T.C.H.), but all of the operations were performed by general surgeons (D.E.M., J.L.T.) and general medical practitioners (D.A.O., O.O.I., E.A.A., S.K.N.). The following factors were analyzed: indication for operation, length of time from initial relief of urinary obstruction until operation, need for and amount of perioperative blood transfusion, mortality rate, early complications, delayed complications, and weight and histopathology of the operative specimens. Delayed complications were noted and treated at postoperative clinic visits.

#### PERIOPERATIVE TECHNIQUE

Patients with abnormal hemoglobin values were treated with hematinics preoperatively, but no one was given preoperative blood transfusion. Gentamicin was administered perioperatively, and trimethoprim-sulfamethoxazole was given orally for 14 days postoperatively. Spinal anesthesia was used exclusively. An extraperitoneal, suprapubic, midline incision was made. A longitudinal cystostomy was performed and the bladder inspected. The ureteral orifices were identified and protected from injury during the procedure. A transverse incision was made by electrocautery posteriorly through the bladder neck mucosa between the trigone and the prostate. Digital enucleation of the prostate adenoma was then performed. Hemostatic sutures of 2-0 absorbable material were placed routinely at the 5 and 7 o'clock positions and at any other visible bleeding areas in the bladder neck or prostate fossa. A heavy (0, 1) nylon or polypropylene suture was then placed as a purse-string in the bladder neck as described by Malement.<sup>7</sup> The ends of the suture were brought percutaneously to a suprapubic location. A 20 or 22 F Foley catheter was then placed transurethraly so that the tip and the balloon remained in the bladder. Only 10 cc were used to fill the balloon. Bladder closure was performed with absorbable sutures. After initiation of the bladder closure, the purse-string suture was ligated externally over a gauze sponge with intravesical digital confirmation of the placement of the catheter and function of the purse-string. The bladder closure was then completed and the catheter irrigated to ensure patency. An extravesical Penrose drain was brought through the inferior part of the midline wound, and layered closure of the abdominal wall incision was performed.

Postoperatively, the catheter was connected to a closed drainage system. Traction on the catheter to compress the bladder neck and prostate fossa was not utilized, since the purpose of the purse-string technique is simply to partition the bladder from the bleeding prostate fossa and not to apply pressure. Intermittent irrigation was performed if the catheter began to clot. If clots could not be successfully evacuated using intermittent syringe irrigation, the patient was taken back to the operating room for further management. In uncomplicated cases the purse-string suture was removed 24 hours postoperatively. The urethral catheter was routinely removed on the 7th postoperative day, and, if micriturition was satisfactory, the patient was discharged from the hospital on the following day. If voiding was unsatisfactory, a urethral catheter was reinserted for 7 more days before the patient was given a second voiding trial. Postoperative clinic visits were routinely conducted at monthly intervals for the first 6 months and semiannually thereafter.

#### RESULTS

Most adult patients in this region of the world do not accurately know their ages. Therefore, only a general statement can be made that all 240 patients in this study were middle-aged or elderly men who presented to a health care facility with acute urinary retention and underwent emergent bladder decompression, usually with a transurethral catheter. If suprapubic cystostomy had been utilized for the initial decompression, a transurethral catheter was secondarily placed at our institution, and the suprapubic tube was removed to allow complete closure of the suprapubic wound prior to prostatectomy. The average time from initial catheter placement until operation was 2.5 months (range, 2 days to 26 months). A few delays were for the purpose of improving the patients' operative risk factors, but most delays were attributed to the patients' inability to accept the financial obligations incurred by operation. There was no difference in outcome related to the length of delay prior to operation. The average operative specimen weight was 61 g (range, 10 g to 300 g). Fifteen percent of the specimens were at least 100 g. Microscopic foci of adenocarcinoma were found in 9.6% of the specimens.

There were no deaths in these 240 patients, and there were no early complications in 83.7% of the patients. There were a total of 47 (19.6%) early complications (Table I) occurring in 39 patients (16.3%). Blood transfusion was considered an early complication. One patient (0.4%) was transfused intraoperatively, and 10 patients (4.1%) were transfused postoperatively. Five of these were given 2 U of blood, and 6 were given only 1 U. All 6 of the 1 U transfusions appear to have been ordered without justification, since there was no

**TABLE 1. Comparison of complication rates for overall series and for last half of series**

Specific Complication	Total Series Rate (%)	Second Half Rate (%)
Mortality	0	0
Blood transfusion	4.6	1.7
Justifiable transfusion	2.1	1.7
Clot retention (total)	6.7	0.8
Reoperation for clot retention	2.9	0.8
Delayed clot retention	0.4	0.8
Problem removing partition suture	1.3	0
Wound infection	2.9	2.5
Epididymo-orchitis	1.3	0.8
Spontaneous voiding delay > 1 week	2.5	1.7
Overall early complication rate	19.6	8.3

hypotension and since postoperative, pretransfusion hematocrits were all greater than 30%. The justifiable transfusion rate was therefore only 2.1%. Sixteen patients (6.7%) had clot retention within 24 hours of operation despite the partition suture. Nine of these responded to intermittent syringe irrigation, but 7 (2.9%) required a return to the operating room for repeat cystotomy, evacuation of clots, and placement of a suprapubic tube for continuous irrigation. One patient had clot retention 2 weeks after discharge and required a return to the operating room for evacuation.

In 3 patients (1.3%), the purse-string suture was not properly removed, and each of these patients had to return to the operating room for retrieval of the suture from the perivesical space. Other early complications included wound infection in 7 patients (2.9%) and epididymo-orchitis in 3 (1.3%). Six patients (2.5%) were unable to void properly after removal of the urethral catheter 1 week postoperatively and each responded to reinsertion of a urethral catheter and removal after a second week. The average time from operation to discharge for all patients was 9 days.

Late complications in this series included temporary (2 month), mild incontinence in 1 patient (0.4%) and bladder neck stenosis in 4 (1.7%) patients. Three of the patients with stenosis responded well to a single dilation and have not required further dilation. The fourth patient was lost to follow-up after the initial dilation.

#### COMMENT

In the technologically advanced world where the majority of the world's urologists practice, it is generally agreed that TURP is the primary modality for relief of bladder outlet obstruction

from benign disease, despite contemporary studies suggesting higher rates of repeat operation and long-term mortality associated with TURP.<sup>4-6</sup> In the less technologically developed areas of the world, TURP by a urologist is not usually a surgical option; and general surgeons and general practitioners treat the majority of bladder outlet obstructions using open prostatectomy.

Suprapubic prostatectomy is a transvesical method of enucleating an enlarged and obstructing prostate gland. The first documented transvesical partial prostatectomy was performed in 1827, but it was not until the latter part of the 19th and early part of the 20th centuries that suprapubic prostatectomy became an accepted method for the management of prostate enlargement.<sup>8</sup> Numerous modifications of the initial technique have been proposed throughout this century, most of them directed toward improvements in hemostasis and postoperative drainage. The concept of control of postoperative hemorrhage by separation of the bladder neck from the prostate fossa was presented by Lower in 1927<sup>9</sup> and Harris in 1930<sup>10</sup> using an absorbable bladder neck suture. Hryntsckak<sup>11</sup> modified and popularized this technique in 1951. Others have introduced modifications into the Hryntsckak technique with equivocal results.<sup>12,13</sup> De La Pena and Alcina in 1962<sup>14</sup> proposed separation of the bladder cavity from the prostate fossa using a removable purse-string suture. Malement in 1965<sup>7</sup> utilized the removable partition suture in 70 patients and noted a marked reduction in both the quantity and duration of postoperative hemorrhage, although he did not present data to support this claim. Favorable results using the Malement technique have been documented by Cohen *et al.*<sup>15</sup> and by Nicoll *et al.*<sup>16</sup> The Malement technique was introduced into our surgical practice in Nigeria in 1984 in an attempt to decrease the need for perioperative blood transfusion and to decrease the amount of supplies and nursing personnel needed for routine postoperative continuous bladder irrigation through a suprapubic tube.

The mortality rates for both transurethral and open prostatectomies have decreased significantly in the past three decades.<sup>1</sup> The ultimate goal of 0% mortality rate was achieved in this series. The AHCPR BPH Guideline combined analysis of older open prostatectomy series yielded a perioperative mortality rate of 2.4% (90% confidence interval [CI], 1.0% to 4.6%).<sup>3</sup> A cause-and-effect relationship between use of the partition suture and low mortality rate can, however, only be inferred, since there is no control group. Other factors probably contributing to the low mortality rate are the excellent operative exposure afforded by use of an adjustable fiberoptic headlight and the low incidence of arteriosclerosis and pulmonary disease in this patient population.

Two hundred one (83.7%) patients in this series had no complications, but the remaining 39 (16.3%) patients accounted for a total of 47 (19.6%) early complications. This is similar to the 21% (90% CI, 7.0 to 42.7%) possibility of complications reported by AHCPR.<sup>3</sup> The blood transfusion rate of 4.5% (justifiable rate, 2.1%) in this series is significantly lower than the 35% rate determined by a combined analysis of open prostatectomy series,<sup>3</sup> although an 8% transfusion rate was achieved by Nicoll *et al.*<sup>16</sup> using a removable purse-string technique. Prior to 1984 when we began using the Malement technique, the transfusion rate in our hospital for prostatectomy patients was approximately 25%. These patients cannot, however, be strictly used as historical controls to compare with the current Malement technique patients, since in the 1980s more factors changed than just our surgical technique. When the human immunodeficiency virus (HIV) presented in Nigeria, we became much more judicious in our indications for blood transfusion, especially since we did not have the capabilities for screening transfused blood for HIV at that time.

The most significant postoperative complication, and the one that the purse-string technique was designed to prevent, is urinary bladder clot retention. This, somewhat discouragingly, occurred in 16 patients (6.7%), with 7 patients (2.9%) requiring a return to the operating room for repeat cystotomy, evacuation of clots, and placement of a suprapubic tube for continuous irrigation. Presumably in these patients the purse-string suture had been placed improperly, since blood should not reflux into the bladder with a correctly placed suture. When the purse-string suture is properly functioning, frank blood can often be seen coming from the penile meatus while the urine in the drainage bag is perfectly clear.

As experience with the purse-string technique was gained in this series, the early complication rate decreased dramatically (Table I). In the second half of this series the overall early complication rate dropped to 8.3%, only 1 (0.8%) patient experienced perioperative clot retention, and only 2 (1.7%) patients were transfused. Each of these decreases in the second half was statistically significant ( $P < 0.001$ ,  $P < 0.001$ ,  $P < 0.01$ , respectively). Three patients (1.3%) in this series had to be returned to the operating room for retrieval of the purse-string suture from the perivesical space. Two of these occurred on the same day, and failure to retrieve them was attributed to improper placement. The third one was improperly cut during the removal process. None of the three required repeat cystotomy. The 7 (2.9%) patients with wound infection responded well to removal of skin sutures to drain the infection, and all of

TABLE II. Comparison of TURP in the United States with open prostatectomy in Nigeria

Type of Resection	TURP	Suprapubic Enucleation
Presented in acute urinary retention (%)	27	100
Spinal anesthesia (%)	77	100
Early complication rate (%)	25	19.6
Mortality (%)	0.2	0
Blood transfusion (%)	6	4.6
Clot retention (%)	3.3	6.7
Postoperative days until urethral catheter discontinued	3	7
Discharged with urethral catheter (%)	2.4	0
Carcinoma in operative specimen (%)	22	9.6
Specimen weight (g)	22	61

the wounds then healed by secondary intention. Epididymo-orchitis occurred in only 4 (1.7%) patients even though vasectomy was not performed as recommended by Nicoll *et al.*<sup>16</sup> Stillwell *et al.*<sup>17</sup> have shown that 6% of glands enucleated for presumed benign disease in their institution were found to contain unsuspected foci of carcinoma. Our rate for unsuspected carcinoma was 9.6%.

Our series of patients treated in the developing world by general surgeons and general practitioners using suprapubic prostatectomy is compared with the large series reported by Mebust and associates<sup>18</sup> of TURPs performed by urologists in the United States (Table II). Patients in our series were usually better operative risks because of a markedly lower incidence of chronic pulmonary disease and arteriosclerotic cardiovascular and cerebrovascular disease. Myocardial infarction, however, accounted for only 0.05% of the complications in patients in the United States. All patients in our series presented in acute urinary retention, in contrast to only 27% in the US series. Mebust and associates comment that patients presenting with acute urinary retention had a significantly higher overall complication rate, including higher rates of postoperative infection, failure to void, and hypotonic bladder. There was no correlation of adverse outcome with length of delay prior to operation in our series. All operations in our series and 77% in the US series were performed using spinal anesthesia. The overall early complication rate in the US series was 25% and in the Nigerian series, 19.6%. Mortality rates of 0.2% in the United States and 0% in Nigeria were similarly low, as were transfusion rates of 6.4% and 4.6%, respectively. Carcinoma was identified in 22% of the Mebust *et al.* specimens and 9.6% of our own. A clot retention rate of 6.7% in our series was higher than the 3.3% reported by Mebust

and associates. The average weight of the resected specimen was 22 g in the US series and 61 g in the Nigerian series. Mebust and associates note that the complication rate was greater in glands larger than 45 g. There was no correlation between gland size and complication rate in our Nigerian series.

Hospital discharge customs and factors considered in postoperative removal of the urethral catheter are quite different in the developing world. Supplies such as Foley catheters are scarce, and simple reinsertion of a catheter may entail a significant financial investment for the patient (daily bed fee \$.70, Foley catheter \$4). We tend, therefore, to leave the urethral catheter in place until we are reasonably sure that spontaneous voiding will occur. In our series the urethral catheter was routinely removed on the 7th postoperative day, and 97.5% of the patients voided well. The remaining 2.5% all voided well after another week of transurethral drainage. No patient in our series left the hospital with an indwelling catheter, compared to 2.4% of patients in the US series. Patients in our Nigerian hospital are generally not affected by insurance carriers, the diagnosis-related group system, malpractice concerns, and other economic factors so important in the US series; and therefore Nigerian patients generally prefer to remain in the hospital until they are totally and unquestionably well and until adequate transportation to their homes can be arranged. This may help to explain the relatively long average postoperative stay of 9 days in our series. The total bill for suprapubic prostatectomy in our hospital, including surgeon's fee, operation, anesthesia, 9 days of admission, medications, supplies, etc., is less than \$200; but this \$200 represents at least a 2-month salary for a middle-income Nigerian worker in our community.

We believe that the technique of suprapubic prostatectomy using a removable bladder neck purse-string suture is an appropriate technique for use in our developing world hospital because of its low associated mortality and transfusion rates and because it conserves nursing care and chronically scarce supplies. As a result of this study, we no longer routinely cross-match blood preoperatively for prostatectomy patients. The overall early complication rate of 19.6% is acceptable and has been shown in this study to decrease markedly as experience with the technique increases.

This contemporary series demonstrates that open prostatectomy can be performed with morbidity and mortality rates comparable to TURP. Moreover, the outcome of open surgical therapy appears excellent in men presenting with urinary retention. Although patients generally prefer

TURP to open prostatectomy because of shorter recovery time and less pain, the low mortality and morbidity of open surgery make it an acceptable option when the patient's anatomy or the state of local medical facilities precludes TURP.

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