Complication rates in 1,000 consecutive patients who underwent radical retropubic prostatectomy for clinically localized prostate cancer between November 1989 and January 1992 were assessed and compared to complication rates in a historical group of patients operated on by primarily the same surgeons prior to 1987. In the contemporary series, there were no operative deaths, only 22% of patients required blood transfusion, and only six (0.6%) patients suffered rectal injuries. Early complications, including myocardial infarction, pulmonary embolism, bacteremia, and wound infection, occurred in less than 1% of patients. Vesical neck contracture, the most common late complication, developed in 87 patients (8.7%). At 1 year post-surgery, 80% of patients were completely continent, and fewer than 1% were totally incontinent. [ONCOLOGY 9(5):379-389, 1995]

Introduction

Radical retropubic prostatectomy provides excellent control of the primary tumor burden in patients with clinically localized prostate cancer [1-3]. The introduction of serum prostate-specific antigen (PSA) and transrectal ultrasound of the prostate has increased the rate of detection of clinically localized disease. This better rate of detection, coupled with technical advancements in the procedure itself, which have reduced associated morbidity, and increased surgeon experience, has broadened the indications for radical surgery and increased the number of possible candidates. It is therefore appropriate to evaluate the contemporary morbidity of this procedure. In this study, we report a morbidity assessment of 1,000 consecutive patients with clinically localized prostate cancer who were treated with bilateral pelvic lymph node dissection and radical retropubic prostatectomy at our institution between 1989 and 1992.

Patients and Methods

Between November 1989 and January 1992, 1,000 consecutive patients underwent radical retropubic prostatectomy for clinically localized (equal to or less than T2) prostate cancer at the Mayo Clinic. Ten urologic surgeons in a group practice, in addition to urologic oncology fellows and senior residents, contributed patients to this contemporary series. Candidates included those patients who met the following criteria: (1) low comorbidity (Carlson index) with a 10-year life expectancy; (2) histologic confirmation of cancer, usually by means of transrectal needle biopsy; (3) disease limited to the prostate gland, as determined by digital rectal examination; and (4) no evidence of distant metastases on clinical, biochemical, radiographic, and radionuclide assessments. Mean patient age was 66 years (range, 45 to 82 years).

Patients were followed for at least 18 months. Follow-up evaluations were conducted quarterly for the first 1 to 2 years after surgery and at least biannually for the next 2 years. The complication rates in this contemporary series were compared to a historical group of patients (n = 1,143) operated on by primarily the same surgeons prior to 1987 [4].

Assessment of Complications--The following surgical complications were assessed: perioperative mortality (defined as any death occurring within 30 days of surgery), rectal injury, estimated intraoperative blood loss, and hospital transfusion requirement (blood products administered intraoperatively or during the course of hospitalization). Early complications (occurring within 30 days of surgery) included myocardial infarction, pulmonary embolism, deep vein leg thrombosis, sepsis (positive blood culture), and wound infection.

Late complications (developing after 30 days of surgery) included pulmonary emboli, deep vein leg thrombosis, pelvic abscess, pelvic lymphocele, and vesical neck contracture. Pelvic abscess and
lymphocele were diagnosed on the basis of postoperative ultrasound and/or CT scan. Vesical neck contracture was defined as any narrowing of the vesical urethral anastomosis, observed cystoscopically, which required dilation or transurethral incision.

**Follow-up Functional Assessments**—Continence, evaluated at 1 year after surgery, was divided into the following categories: (1) dry (no pads required); (2) rarely incontinent (1 or less pad [safety] per day utilized); (3) stress incontinence (> 1 pad per day required); (4) totally incontinent; (5) incontinent preoperatively; and (6) continence restored with an artificial genitourinary sphincter. Postoperative erectile function was not prospectively or objectively assessed.

### Results

**Contemporary Series Data**—Data from the morbidity assessment are displayed in Table 1. There were no operative deaths. Mean operative blood loss was less than 1,000 cc, and only 22% of patients required blood transfusions. Six patients (0.6%) sustained rectal injuries, all of which were identified intraoperatively and repaired primarily without the need for a diverting colostomy. Early complications, including myocardial infarction, pulmonary embolism, bacteremia, and wound infection, occurred in less than 1% of the patients; deep venous thrombosis occurred in 1.4% of the patients.

The most common late complication was vesical neck contracture, which occurred in 87 patients (8.7%). These contractures were treated with either simple dilation or transurethral incision without further consequence. Other late complications included deep vein thrombosis in five patients (0.5%) and pulmonary embolism in one patient (0.1%). One patient each developed a symptomatic pelvic abscess and a large pelvic lymphocele; both problems were successfully treated with percutaneous aspiration.

Data on postoperative continence were available for all patients, and are summarized in Table 2. At 1 year after surgery, 788 (79%) of patients were completely dry (ie, required no pads). An additional 157 patients (16%) reported having rare incontinent episodes with strenuous activity and required one or no pads per day. Fewer than 1% of patients were totally incontinent, 6 (0.6%) needed a genitourinary sphincter.

**Comparative Data**—Table 3 summarizes the data from the contemporary and historical (early) groups [4]. The incidence of all complications, except for vesical neck contracture, was lower in the contemporary group. Furthermore, use of transfusion in the earlier period was 77%, compared with 22% from 1989 to 1992. More than 50% of patients in the contemporary group were discharged within 7 days after surgery (median, 6 days), compared with only 5% of the early group.

Urinary continence rates in the contemporary and early series were essentially parallel; 80% of patients in both series were completely continent at 1 year after surgery [4]. The percentage of totally incontinent patients, however, was lower in the contemporary than in the early group (< 1% vs 3%).

### Discussion

Historically, radical prostatectomy was associated with significant blood loss and a high complication rate. Therefore, definitive radiation therapy was utilized more frequently for the treatment of clinically localized disease [5,6]. Complete understanding of the anatomy of both the superficial and deep components of the dorsal vein complex was necessary to avoid the rapid, significant blood loss previously attributed to radical retropubic prostatectomy [7,8].

Meticulous dissection and control of this venous complex has significantly reduced intraoperative blood loss. The mean estimated blood loss reported in our contemporary series (844 cc) compares favorably to that reported previously [9-11]. Indeed, at present, average blood loss is less than 600 cc and the transfusion rate is less than 5%.

Furthermore, by adequately controlling Santorini's plexus, the apex of the prostate may be dissected out in a nearly bloodless operative field. This precise apical dissection allows for maximal preservation of urethral length, and for preservation of both the passive and active sphincteric continence mechanisms, contributing to the reduced incidence of total postoperative urinary incontinence [12]. Over 94% of the patients in this series were pad-free or required only a safety pad, whereas only 0.8% of the patients were totally incontinent.

In addition, by adequately securing hemostasis, the rectourethralis muscle may be divided sharply, under direct vision, thus avoiding rectal injuries. Newer techniques avoid the rectourethralis muscle and thus rectal injury [13]. Only 6 patients in this series sustained rectal injuries, which falls within the rate observed by other investigators [14]. In the event of a rectal injury, a two-layer closure may
be performed without the need for a diverting colostomy or omental interposition, provided that the patient received a mechanical bowel preparation and was not previously irradiated [15]. Vesical neck contracture has been reported to occur in up to 22% of patients treated with radical prostatectomy [16]. Our rate of 8.7% parallels that reported in another contemporary series [11]. A watertight anastomosis with mucosa-to-mucosa apposition decreases the incidence of bladder-neck scarring. This can be easily carried out when there is precise division of Santorini's venous plexus and adequate preservation of the membranous urethra and bladder neck. We have no explanation, however, for the apparent increase in the incidence of vesical neck contracture compared to our earlier series. This may reflect more compulsive reporting by patients in the contemporary group. Deep vein thromboses and pulmonary embolism are the two most potentially life-threatening complications associated with pelvic cancer surgery. Routine (since 1988) use of sequential compression devices, expeditiously performed surgery, and early postoperative ambulation (in most cases, on the evening of surgery) may have contributed to the reduced incidence of thromboembolic events observed in our series (pulmonary emboli). However, others did not find that the routine use of sequential compression devices afforded additional protection against deep vein thromboses and pulmonary embolism [17].

The rare occurrence of perioperative myocardial infarction can be attributed to improved intraoperative hemostasis, in addition to the low rate of comorbidity in our patient population. The low incidence of symptomatic postoperative pelvic lymphoceles may be due to the performance of a modified obturator node dissection, as well as the exquisite ligation of lymphatic channels with hemoclips during the staging lymphadenectomy.

Recently, the issue of reporting bias has been raised with respect to the morbidity of radical prostatectomy [18]. It was suggested that only those institutions with the best operative results are represented in the surgical literature. Our study provides a unique perspective on the contemporary morbidity reported with radical retropubic prostatectomy, in that ten different surgeons within our group practice, as well as several urologic oncology fellows and senior residents, were contributors to the data presented in this series, rather than one or two surgeons with known operative expertise in the field of prostate cancer. This may eliminate, to some degree, the potential for reporting biases. A 1993 meta-analysis of treatment for localized prostate cancer described disturbingly high death and complication rates [19]. Treatment-associated mortality, and rates of any bowel injury, bowel injury requiring colostomy, total incontinence, and urinary stricture requiring long-term therapy were 1%, 3%, 1.3%, 7%, and 12%, respectively. In contrast, only 0%, 0.6%, 0%, 0.8%, and 8.7% of patients in our contemporary series had similar complications, respectively.

The data in this meta-analysis were derived from a large number of series with relatively small numbers of patients [19]. Moreover, some of these smaller studies, which potentially impact upon patient and clinician decision making with respect to prostate cancer therapy, date back to 1966 [20]. The influence of modern surgical techniques (anatomic radical prostatectomy) were not adequately represented in these older series. In summary, due to the routine use of screening prostate-specific antigen, transrectal ultrasound, and transrectal needle biopsy, prostate cancer is now the most frequently detected cancer in American men [21]. Improvements in surgical technique, especially with regard to intraoperative hemostasis, and increased cumulative experience of surgeons have led to decreased morbidity among patients undergoing radical retropubic prostatectomy. Thus, this procedure should remain a viable option for selected men who seek curative treatment for localized prostate cancer.

References:


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