Nerve Sparing Open Radical Retropubic Prostatectomy—Does It Have an Impact on Urinary Continence?

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Purpose: We prospectively assessed the role of nerve sparing surgery on urinary continence after open radical retropubic prostatectomy.

Materials and Methods: We evaluated a consecutive series of 536 patients who underwent open radical retropubic prostatectomy with attempted bilateral, unilateral or no nerve sparing, as defined by the surgeon, without prior radiotherapy at a minimum followup of 1 year with documented assessment of urinary continence status. Because outlet obstruction may influence continence rates, its incidence and management was also evaluated.

Results: One year after surgery 505 of 536 patients (94.2%) were continent, 27 (5%) had grade I stress incontinence and 4 (0.8%) had grade II stress incontinence. Incontinence was found in 1 of 75 (1.3%), 11 of 322 (3.4%) and 19 of 139 patients (13.7%) with attempted bilateral, attempted unilateral and without attempted nerve sparing, respectively. The proportional differences were highly significant, favoring a nerve sparing technique ($p < 0.0001$). On multiple logistic regression analysis attempted nerve sparing was the only statistically significant factor influencing urinary continence after open radical retropubic prostatectomy (OR 4.77, 95% CI 2.18 to 10.44, $p = 0.0001$). Outlet obstruction at the anastomotic site in 33 of the 536 men (6.2%) developed at a median of 8 weeks (IQR 4 to 12) and was managed by dilation or an endoscopic procedure.

Conclusions: The incidence of incontinence after open radical retropubic prostatectomy is low and continence is highly associated with a nerve sparing technique. Therefore, nerve sparing should be attempted in all patients if the principles of oncological surgery are not compromised.

Key Words: prostate, prostatectomy, urinary continence, bladder neck obstruction

The morbidity of RP has decreased dramatically during the years due to technical improvements.[1,2] However, although urinary incontinence is a rare complication after RP, it has a profound impact on patient quality of life.[3] Another complication of lesser impact is outlet obstruction. While the incidence of these complications is well documented, their etiology is not always evident. We assessed the potential role of nerve sparing surgery on urinary continence after open RRP together with the incidence and management of outlet obstruction because this may influence continence status. We discuss certain aspects of surgical technique that we think help minimize these complications.

PATIENTS AND METHODS

Patients and Surgical Technique

Since 1990, we have prospectively entered into our departmental database whether bilateral, unilateral or no nerve sparing was attempted in all patients undergoing open RRP. In this study we evaluated a consecutive series of 536 patients without prior radiotherapy, a minimum followup of 1 year and documented assessment of urinary continence status.

The surgical technique was performed as previously presented.[4] Patients were placed in a 30-degree Trendelenburg position with overextension of the pelvis. After meticulous lymph node dissection, particularly along the internal iliac vessels, all fatty tissue covering the endopelvic fascia and surrounding the superficial Santorini's vein was removed. The outer layer of the endopelvic fascia was sharply incised medial to the tendinous arc, leaving the puboprostatic ligaments untouched to ensure urethral stability.

For nerve sparing the neurovascular bundle was carefully rolled away from the lateral prostate after incision of the second layer of the endopelvic fascia, that is the periprostatic fascia (fig. 1). Nerve sparing was attempted for nonpalpable tumors, if biopsies did not show tumor close to the neurovascular bundle and if not more than 1 biopsy was positive on the ipsilateral side. If nerve sparing was not attempted, at least part of the neurovascular bundle was left on the prostatic capsule and later removed with the prostate specimen.

The deep Santorini's plexus was bunched in a curved Babcock clamp and ligated over the apical prostate and at the bladder neck (fig. 2). The ligated vessels were transected over the ventral aspect of the prostate to avoid damage to the urethral sphincter (fig. 3). The prostatic apex was approached directly along the lateral side of the prostatic capsule toward the membranous urethra, which was then de-

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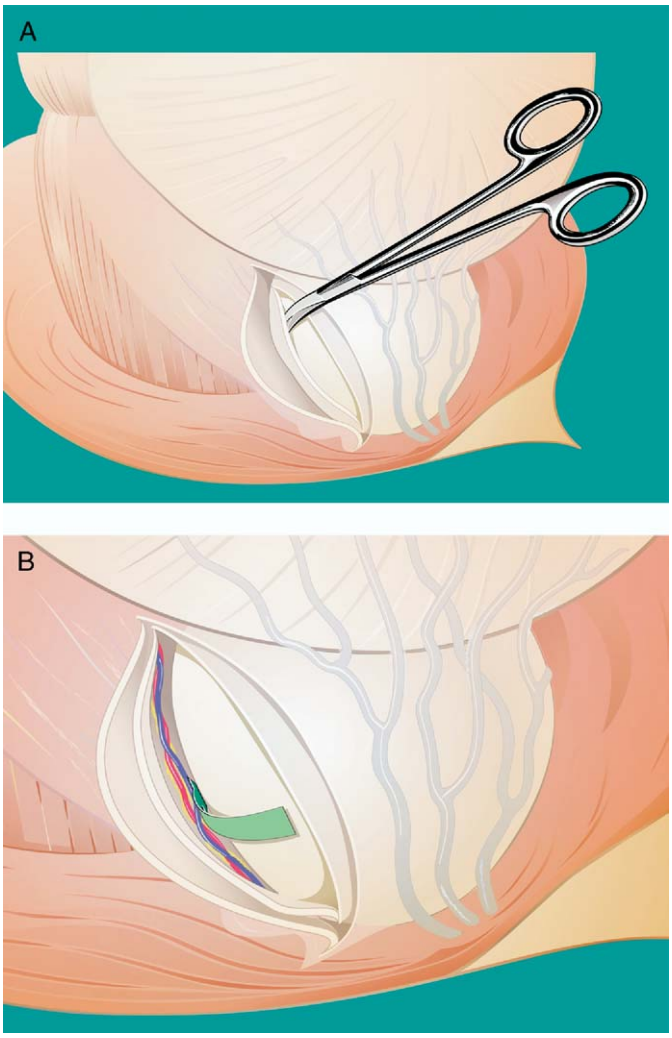

FIG. 1. Sharp dissection of endopelvic and periprostatic fascia off of lateral prostate wall (*A*) and separation of neurovascular bundle from lateral prostate wall (*B*).

veloped out of the doughnut-shaped prostatic apex. The urethra was transected sharply with scissors, not electrocautery, at the level of the distal verumontanum. If necessary, bleeding from Santorini's plexus was controlled by a vertical stitch with a 2-zero polyglycolic acid suture in the coronary plain between Santorini's plexus and the rhabdosphincter, leaving the latter untouched. The suture was then passed a second time perpendicular to the first behind the symphysis, thus, completely encircling Santorini's plexus.

The cranial prostate pedicle was divided by sharp, atraumatic dissection with ligation close to the prostatic capsule on the nontumor bearing side to avoid damage to the proximal portion of the neurovascular bundle. On the tumor bearing side the pedicle was divided about 0.5 to 1.0 cm from the prostate. Superficial 4-zero polyglycolic acid sutures were placed and tied loosely to control bleeding from the neurovascular bundle. Electrocautery was avoided. Following incision of Denonvilliers' fascia care was taken to mobilize the seminal vesicles without causing any trauma by squeezing, pulling or tearing to the adjacent pelvic plexus running along their dorsolateral aspect. The bladder was then opened on the ventral side. After urine ejaculation

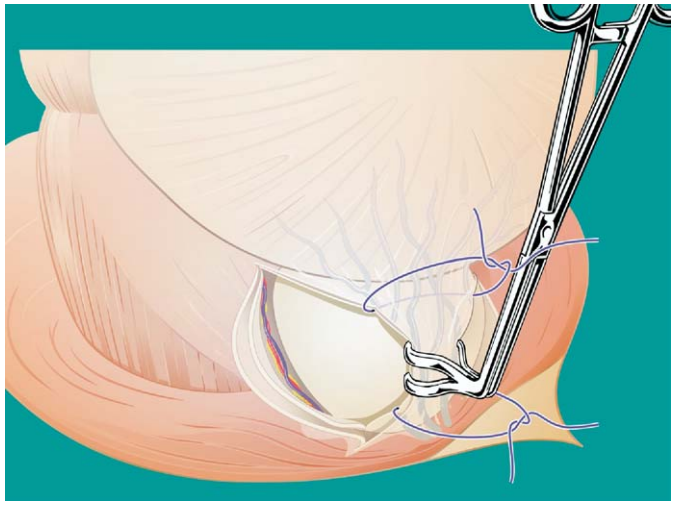

FIG. 2. Bunching of Santorini's plexus, including ventral portion of endopelvic and periprostatic fascia, with curved Babcock clamp over prostatic apex. Ligation was done over prostatic apex and at bladder neck.

allowed localization of the ureteral orifices the trigone was transected 3 to 5 mm caudal of the interureteral ridge and the prostate was removed. Bladder neck sparing was not attempted.

The bladder neck was reconstructed to 8 to 10 mm wide using a continuous 2-zero polyglycolic acid seromuscular suture. The bed of the seminal vesicles was oversewn with a continuous 2-zero polyglycolic acid suture to avoid later bleeding and hematoma. Care was taken not to damage the pelvic plexus located lateral to the seminal vesicle bed. Six 2-zero polyglycolic acid sutures were placed with a UR-6 needle along an 18Fr urethral catheter without eversion of the bladder mucosa to ensure a direct mucosa-to-mucosa anastomosis between the resected margin of the proximal urethra and the reconstructed bladder neck (fig. 4). The 2 dorsal sutures at the 5 and 7 o'clock positions were passed medial to the neurovascular bundles through Denonvilliers' fascia and the urethra, taking approximately 4 mm of the outer part of the urethra but only including the edge of the

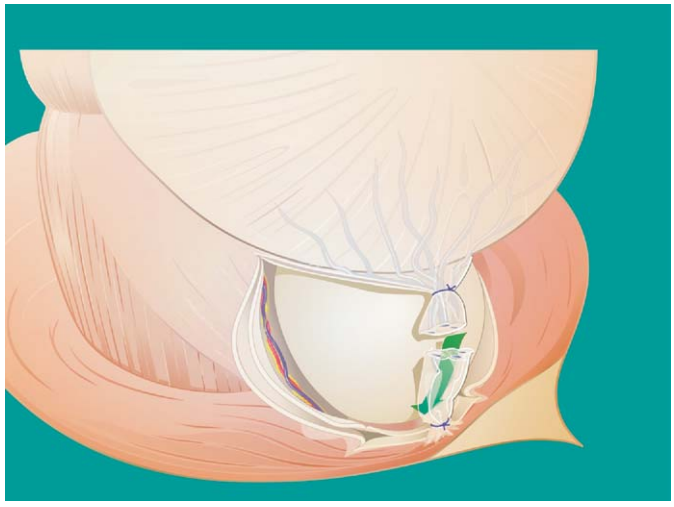

FIG. 3. Transection of Santorini's plexus above prostate and not above urethral sphincter, and preparation of doughnut-shaped prostatic apex along prostatic capsule.