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Radical Retropubic Prostatectomy and Pelvic Lymphadenectomy in Carcinoma of the Prostate

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An operative technique is described which combines regional pelvic lymphadenectomy with radical prostatectomy. The technique has been used on 30 patients with no operative mortality. Morbidity has been within acceptable limits. Thus far, only one patient has shown recurrence of the neoplasm.

Dissemination of neoplasm via the regional lymphatics has been documented in up to 50% of patients with stages A and B carcinoma of the prostate. Since radical prostatectomy is undertaken only in those patients where cure may be reasonably expected, knowledge of the status of the regional lymphatic drainage of the prostate gland is essential. Complete resection of regional lymphatic drainage is necessary to stage the neoplasm adequately, and to improve the cure rates presently obtained by perineal radical prostatectomy.

Since July of 1973, 30 patients have undergone radical retropubic prostatectomy and regional pelvic lymphadenectomy for the diagnosis of carcinoma of the prostate. The operative and pre-operative techniques we advocate are based on our experience with this group of patients.

Materials and methods

Thirty men, ranging in age from 49 to 75 years, underwent radical retropubic prostatectomy and pelvic lymphadenectomy in the period July 1, 1972, through December 30, 1975. All patients were studied by complete history and physical examination, routine laboratory studies, alkaline and acid phosphatase determinations, skeletal x-rays, bone scanning, pedal lymphangiography, and in the past 18 months, a bone marrow acid phosphatase, as obtained by iliac crest aspiration.

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Operative technique

Under a continuous catheter spinal anesthesia, the patient is placed in the supine and frogleg position, and a Foley catheter inserted into the bladder. A transverse suprapubic incision is made, and the rectus muscles split in the midline. After the peritoneal cavity has been dissected upward and off the lateral pelvic wall, the anterior and lateral bladder wall and major vessels in the pelvis are visualized.

1. Lymphadenectomy

Lymphadenectomy is begun at the level of the inguinal ligament. The major lymphatics are clipped with hemoclips, divided, and the external iliac lymphatics and nodes are dissected en-bloc proximally to their junction with the hypogastric nodes, and superiorly to the aortic bifurcation. Care is taken to clip each lymphatic twig, prior to division, to minimize the possibility of dissemination of neoplasm, and to prevent excessive postoperative lymph drainage and the possibility of lymphocele.

With external and common iliac nodes dissected en-bloc, the dissection is carried down the hypogastric vessels and into the obturator fossa. Care is taken to resect those nodes associated with the obturator vessels, the lateral sacrum, and the hypogastric nodal chain. Associated fat and fascia are removed en-bloc with the lymph nodes described. Following adequate dissection, the iliac artery is visualized from its aortic origin to the inguinal ring, the ureter has been identified crossing over the common iliac artery, and the psoas muscle of the lateral pelvic wall is identified. The hypogastric artery and its branching are visible, as are the obturator vessels and obturator nerve. The lymph nodes are labeled as to their source, and submitted for frozen section. Contralateral lymphadenectomy is then performed in the same manner. (Figure 1).

2. Radical prostatectomy

If a frozen section pathologic study confirms no nodal involvement distal to the common iliac chain, radical retropubic prostatectomy is undertaken. The puboprostatic ligaments are identified, divided, and ligated (Figure 2). Periprostatic veins are frequently encountered during this portion of the dissection. They can be the source of troublesome oozing, which must be controlled by adequate hemostasis. After the puboprostatic ligaments have been divided, the membranous urethra can be dissected from the underlying rectum and 2-0 chromic catgut sutures placed in the four quadrants of the membranous urethra. The membranous urethra is then divided. The prostate gland is dissected in a retrograde manner, with the seminal vesicles being freed from the rectum and posterior bladder wall. Each vas deferens is identified, divided and ligated. The portion of Denonvilliers' fascia covering the posterior aspect of the prostate is taken with the surgical specimen. Following mobilization of the prostate gland, the vesical neck is incised, and the complete specimen, including prostate gland, the vesicle neck, seminal vesicles, and vas deferens is removed. The anterior rectal wall is carefully inspected for damage.

3. Reconstruction of bladder neck and urethra

At this point in the procedure the patulous bladder neck is identified (Figure 3). Number 6 retrograde catheters are passed into each ureteral orifice. These are brought out through the anterior wall, to be left in place several days postoperatively.

The bladder neck is then closed, (Figure 4a), with interrupted 2-0 chromic catgut sutures, care being taken to avoid the ureteral orifices. When the bladder neck has been closed to create a stoma of approximately #24 french caliber, Figure 4b, anastomosis with the membranous urethra is performed. The four previously placed sutures are used for anastomosis, one each at 12, 3, 6, and 9 o'clock positions. A #24 Foley catheter is inserted via the urethra. If necessary, gentle traction upon the Foley
balloon may assist in approximation of the urethra to the bladder neck without tension (Figure 5). Our experience has been that the lymphadenectomy frees the bladder to such a degree that this anastomosis can be achieved without tension, and without need for traction of any sort.

Following placement of a suprapubic cystostomy tube, and of Penrose drains lateral to the urethral vesical anastomosis, the incision is closed in layers with 0 chromic catgut. The Foley catheters remain in place for three to five days. The suprapubic tube is removed at the end of one week, and the Foley catheter on the 14th postoperative day.

Results

There has been no operative mortality in the 30 patients operated upon by this technique. Major complications have included six patients who developed wound infection, and two patients in whom there was documented pulmonary embolism. All patients who had normal sexual function prior to their operation have become impotent; 29 of the 30 patients regained urinary continence within two weeks to three months of the operative procedure.

Ten of the 30 patients were found to have positive lymph nodes involving the external
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Figure 4a

Figure 4b
and common iliac group. Eight of the 10 had obturator, hypogastric, and/or iliac nodal involvement as well. In two patients the obturator, hypogastric, and sacral nodes were uninvolved, in spite of the finding of tumor within nodes of the external and common iliac chains.

To date, only one patient has developed recurrent neoplasm. Now 24 months postoperative, this patient had tumor involvement of the common iliac nodes and one seminal vesicle at the time of lymphadenectomy. The remaining patients, irrespective of whether nodes were positive or negative, have thus far shown no evidence of recurrent neoplasm, and are being observed by periodic skeletal survey and scan, serum acid phosphatase determinations, and occasional bone marrow acid phosphatase determinations.

Conclusion

The high incidence of lymphatic involvement in patients with carcinoma of the prostate requires evaluation of regional lymph nodes before a decision is made to perform radical prostatectomy. Ten of the 30 patients in this series had involvement of regional lymphatics, in spite of preoperative clinical determination that the neoplasm was in a surgically curable phase. Other authors have reported that up to 50% of patients with presumed curable neoplasms have unsuspected nodal involvement.¹⁴

We advocate that lymphadenectomy be performed in conjunction with radical prostatectomy. The technique of urethral-vesical anastomosis described minimizes the difficulty of radical prostatectomy by the suprapubic surgical approach.

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References