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Radical Operation For Prostatic Carcinoma

Atsushi KONDO

Department of Urology,
Nagasaki University School of Medicine,
Nagasaki, Japan

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A new operative technique for prostatic carcinoma has been proposed in order to make it possible to operate on patients who have formerly been considered inoperable, thereby increasing the number of patients with complete cure by means of dissection of the pelvic lymphatics and the paraprostatium. Up to the present time, six of the ten patients who underwent this surgical procedure are still alive without recurrence.

Hormonal therapy of prostatic carcinoma has contributed to the improvement of clinical symptoms and the increase in the survival rate of patients. According to the statistics of EMMETT[2] in 1960, five-year survival rate was 56.8% and ten-year survival rate was 26.5% among patients with intraprostatic type of prostatic carcinoma without metastasis in whom early orchiectomy was performed. Five and ten-year survival rates, however, were 18.5% and 7.9% respectively among the patients with extraprostatic type of prostatic carcinoma with metastases.

In 1954, JEWETT[4] reported on the follow-up studies of radical perineal prostatectomy that five-year and ten-year survival rates were 61% and 37% respectively in the intraprostatic group in comparison with 12.5% of ten-year survival rate in the extraprostatic group. Accordingly hormonal therapy and surgery are both effective for the intraprostatic type of cases, and on the other hand, some problems still remain for urologists in the treatment of the extraprostatic type of cases. The indication for operative treatment for prostatic carcinoma has been generally limited only to the intraprostatic type of patient in spite of the great efforts made by many urological surgeons.

In 1959, FLOCKS et al[3] investigated local metases of prostatic carcinomas without distant metastases in 411 cases undergoing open procedures and described the incidence of the following three groups:

In group I, lesions were confined within the prostatic capsules in only 27 cases (6.6%).

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In group II, local invasions only around the prostatic capsules were found in 236 cases (57.4%).

In group III, metastases in the pelvic lymph nodes were found in 146 cases (35.5%).

It is considered that in group I the lesions can be eradicated by a simple total prostatectomy in the usual manner, but the incidence of this group is very low as described above. In group II and group III, radical cure is theoretically possible if the complete dissection of the metastases is performed.

Ten patients were treated by the surgical technique presented here, which attempted to provide a more radical prostatectomy than is usually done, as well as to increase the number of patients with complete cure.

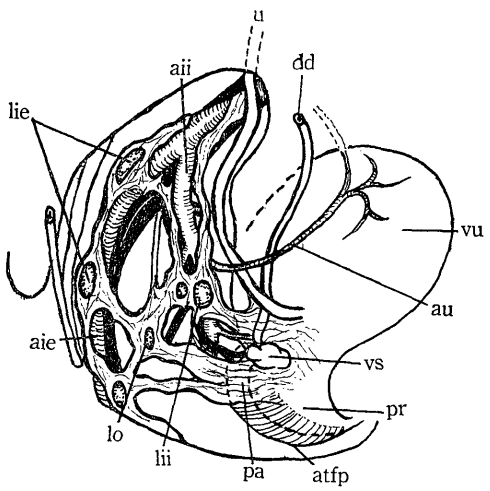

Fig. 1. Lymphetics of prostate. lie : external iliac lymphatics, lii : internal iliac lymphatics, lo : obturator lymphatics, pa : paraprostatium, atfp : arcus tendineus fasciae pelvis, aie : external iliac artery, aii : internal iliac artery, au : umbilical artery, u : ureter, dd : deferent duct, vu : urinary bladder, vs: seminal vesicle, pr : prostate.

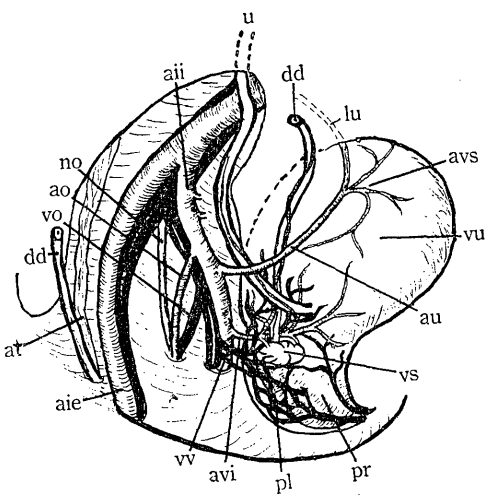

Fig. 2. Blood supply of prostate. aie : external iliac artery, aii: internal iliac artery, ao : obturator artery, at : testicular artery, au : umbilical artery, avs: superior vesical artery, avi : inferior vesical artery, lu : umbilical ligament, no : obturator nerve, pl : vesical and prostatic venous plexus, vo: obturator vein, vv : vesical veins.

Anatomical Considerations.

The lymphatics of the prostate are shown in figure 1. In the radical operation for prostatic carcinoma, it is necessary that the paraprostatium is completely removed as well as the pelvic lymphatics. However, uncontrollable bleeding occurs sometimes in dissection of the paraprostatium because it contains the venous plexus. A devised surgical technique aims at complete removal of the paraprostatium with safety.

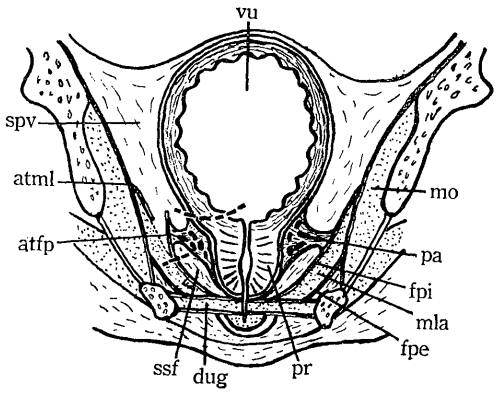

Fig. 3. Dissection of paraprostatium atfp : arcus tendineus fasciae pelvis, atml : arcus tendineus m. levatoris ani, fpe : fascia diaphragmatis pelvis externa, fpi : fascia diaphragmatis pelvis interna, dug : diaphragma urogenitale, mla : levator ani muscle, mo : obturator muscle, spv : lateral perivesical space, ssf : spatium subfasciale, pa : paraprostatium.

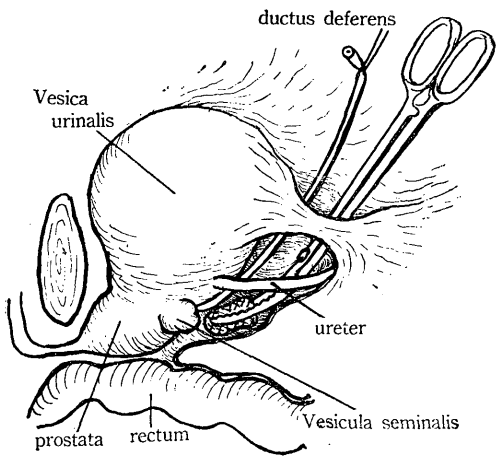

Fig. 4. Dissection of deferent duct.

The blood supply of the prostate is shown in figure 2. These blood vessels can be clearly seen when the pelvic lymphatics have been removed. The inferior vesical artery and the vesical veins are ligated and divided, and the venous branches from the dorsal penis profunda are also ligated and divided at the prostatic apex. The blood supply to the prostate is then completely shut off. After such a procedure, complete removal of the paraprastatium as a mass with the fascia of levator ani should be possible through an incision made along the arcus tendineus fasciae pelvis just lateral to the prostate (figure 3).

Operative Technique.

The patient is placed in the Trendelenburg position and his legs are spread slightly. The operation is done under general anesthesia. Skin incision is made in the midline, beginning from the navel down to the upper border of the symphysis pubis. The underlying rectus sheath is incised and the rectus muscles retracted laterally. The anterior and lateral space of the bladder are opened.

Dissection of the deferent ducts:

The deferent duct of one side is ligated and divided after it is separated from the peritoneum in the lateral perivesical space. Pulling the cut end of the duct upwards, it is further dissected proximally

down to the ampulla (figure 4). When the other side of duct is dissected in the same manner, the retrovesical space behind the vesical neck is opened as widely as possible.

Dissection of the lymphatics:

The lateral perivesical space is opened widely enouth to dissect the common iliac artery. The ureter is isolated and dissected towards the ureterovesical junction on each side. The common iliac lymphatics, the external iliac lymphatics, the obturator lymphatics and internal iliac lymphatics are removed one after another, including the fatty tissues.

Ligation of the blood vessels:

At first the umbilical artery, from which the superior vesicrl artery branches, is isolated and left behind. Then the inferior vesical artery and the two or three branches of the vesical veins are ligated and divided. (Fig. 5)

Division of the membranous urethra:

The prevesical space is widely opened. Both anterior surface and lateral fossae of the prostatic capsule are gently sponged to free them

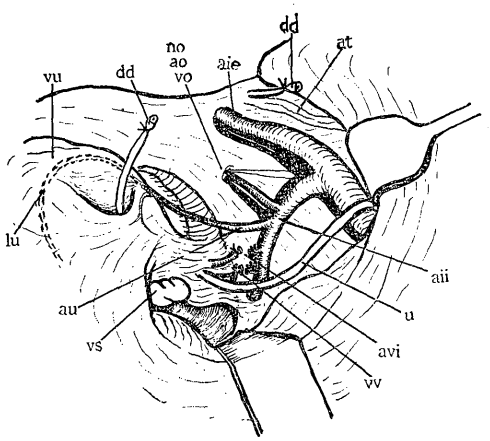

Fig. 5. Ligation of blood vessels.

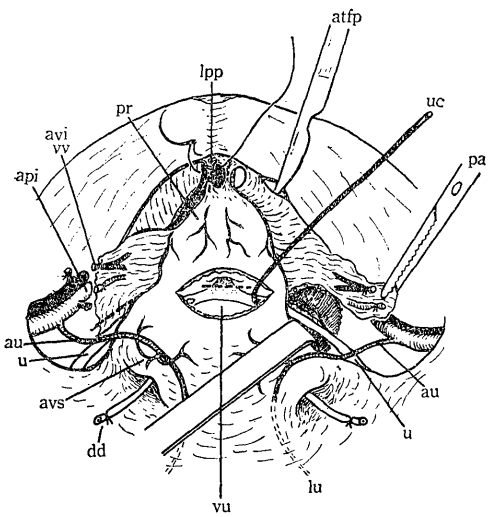

Fig. 6. Incision of pelvic fascia, ligation of veins at prostatic apex and incision of vesical neck.
api : internal pudendal artery, lpp : puboprostatic ligament, uc : ureteral catheter.

of adherent fat. The fascia of levator ani muscle is incised along the arcus tendineus fasciae pelvis, just lateral to the prostate. (Fig. 6) The pelvic fascia including the paraprostatium is detached from the levator ani muscle. The veins at the prostatic apex are ligated with boomerang needle. The puboprostatic ligaments and the membraneous urethra are then divided. Through these procedures the blood supply to the prostate can be almost completely shut off resulting in very minimal bleeding in the following procedures.

Division of the vesical neck:

A transverse incision is made in the anterior wall of the vesical neck and a ureteral catheter is inserted into the ureteral orifice on each side. (Fig. 6) The gauze is packed into the retrovesical space and the posterior wall of the vesical neck is incised. The lateral walls of the vesical neck are divided bilaterally being careful not to injure the ureters, thereby the bladder is separated from the prostate and this makes it possible to draw up the bladder with both ureters and superior vesical arteries attached to it. (Fig. 7)

Dissection between the prostate and the rectum & Division of the paraprostatium:

The prostate is elevated and Denonvilliers' fascia is dissected between the prostate and the rectum as widely as possible. (Fig. 8) The paraprostatium has been freed from the pelvic wall by the foregoing dissection of the fascia of levator ani muscle. Then the paraprostatium is divided at the deepest point of its attachment. (Fig. 8) Both prostate and seminal vesicles are completely removed as a mass with the paraprostatium. (Fig. 9)

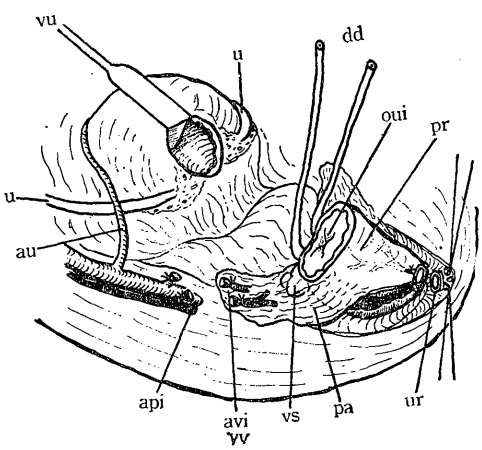

Fig. 7. Division of vesical neck. ur : urethra, oui : vesical orifice.

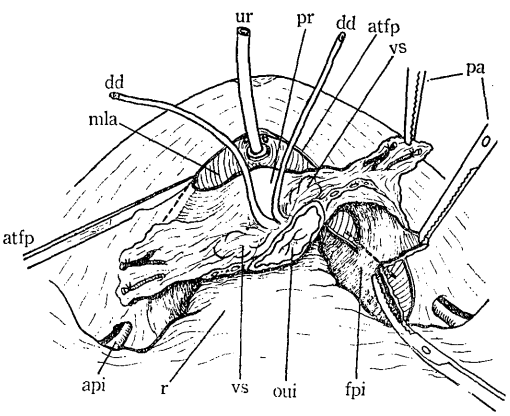

Fig. 8. Division of paraprostatium. atfp: arcus tendineus fasciae pelvis, mla : levator ani muscle, pa : paraprostatium, r : rectum.

Fig. 9. removed specimen.

Anastomosis of the vesical neck to the urethra:

After the discrepancy in diameter is corrected by placing a few sutures with catgut at the posterior portion of the divided vesical neck, the vesical neck and the membranous urethra are approximated to each other over a retention catheter, fastened with four interrupted sutures of ribbon catgut. (Fig. 10) A suture made on the posterior vesical neck is pulled through the perineum and tied by CHUTE's technique.[1] (Fig. 11) The abdominal wall is closed in two layers after para-anal drain and retropubic drain are placed.

Postoperatively the bladder is irrigated daily. The para-anal drain is removed several days after urinary leakage from the drains has stopped.

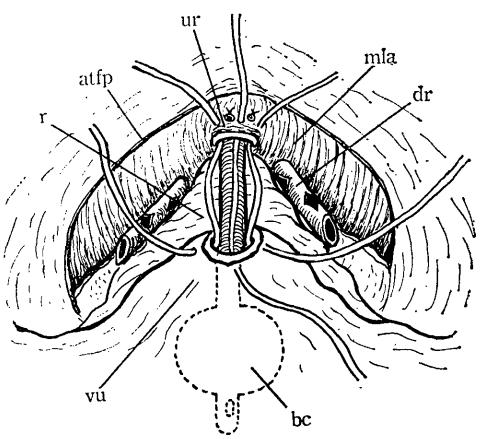

Fig. 10. Anastomosis of vesical neck to urethra (1).
dr. para-anal drain, bc. bag catheter.

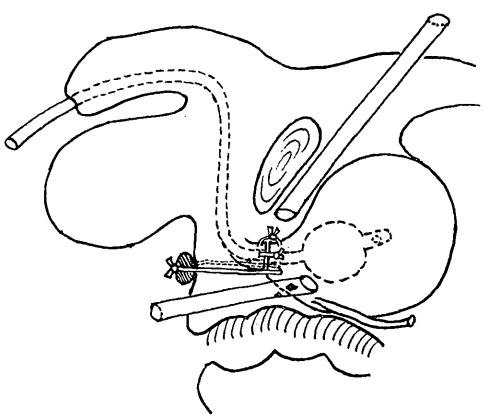

Fig. 11. Anastomosis of vesical neck to urethra (2).

CONCLUSION.

A new operative technique for prostatic carcinoma has been presented. This procedure has been proposed in order to make it possible to operate on patients who have formerly been considered inoperable, thereby increasing the number of patients with complete cure by means of dissection of the pelvic lymphatics and the paraprostatium.

Up to the present time, six of the ten patients who underwent this surgical procedure are still alive without recurrence. One died of distant metastasis and the other three died of general weakness. Follow-up studies are being continued.

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