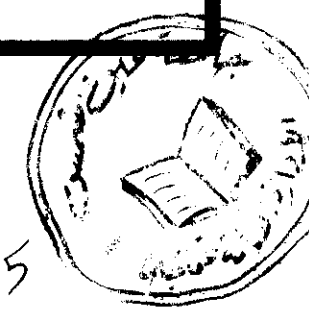
BLADDER REPLACEMENT AFTER RADICAL CYSTECTOMY FOR CANCER BLADDER



An Essay Submitted for Partial Fulfillment of
MASTER DEGREE IN GENERAL SURGERY

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Emil Awad Zaky
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THE VESICAL LIGAMENTS

The bladder is connected on each side by the lateral true ligaments to the tendinous arch of the pelvic fascia which is a condensation of the superior part of the levator ani fascia, extending from the lower border of the symphysis pubis to the spine of the ischium. Anteriorly, the fibro-areolar tissue of the true vesical ligament forms well thickened bands on each side of the median plane termed the lateral and medial pubo-prostatic ligaments. The lateral one extends from the anterior part of the tendinous pelvic fascia downwards and medially to blend with the upper part of the sheath of the prostate. The medial ligament, on the other had passes downwards and backwards from the back of the symphysis pubis to the sheath of the prostate forming the floor of the retropubic space. The median umbilical ligament (remnant of the urachus) connects the apex of the bladder with umbilicus. As the veins of the vesical plexus stream backwards from the lateral borders of the base of the bladder

to join the internal iliac veins, they are enveloped in band of fibro-areolar tissue, the posterior ligament of the bladder. The functional value of these various vesical ligaments attached to the bladder consist of peritoneal folds and are termed false ligaments on the account that they do not share in the supportive function of the bladder. These are the median umbilical ligaments at the reflection of the peritoneum from the bladders to the side walls of the pelvis. The sacro-genital folds constitute the posterior false ligaments *(Gray, 1975)*.

ARTERIAL SUPPLY

The arterial supply to the bladder comes from the superior and inferior vesical arteries, which are branches from the anterior division of he hypogastric artery. Smaller branches from the obturator and inferior gluteal arteries also reach the urinary bladder. The bladder is a very vascular organ, well supplied by all these vessels, with rich anastomosis between all of them *(Rouvier, 1938)*.

VENOUS DRAINAGE

There is a rich plexus of veins surrounding the bladder usually lying between the bladder wall proper and the adventitial layer covering it. The veins ultimately terminate in the hypogastric veins after gathering together in several mains trunks. Some of them accompany the arteries, and others do not. The vesico-venous plexus also communicates with the retropubic venous plexus of Santorini, which drains the penis as well as other pelvic organs *(Tanagho, 1981)*.

LYMPHATIC DRAINAGE

In the later nineteenth century, *Poirier and Curea* used gargerotas technique of injecting Prussian blue postmortem to visualize the lymphatics (in fetuses and adults) with subsequent anatomical dissection to define lymphatic channels. The current descriptions of the lymphatic anatomy of the bladder stem from this work *(Harrison and Clouse, 1989)*.

Bladder lymphatics originate from a mucosal and muscular plexus and they give rise to the three groups of collecting trunks:

1. The trigonal trunks.

2. The posterior wall trunks.

3. The anterior wall trunks.

They usually terminate in the medial or middle group (more commonly referred to as the obturator node) of the external iliac nodal chain. Theses trunks also can terminate in the femoral node (Cloquet's node) and infrequently they can terminate in a hypogastric node or in the common iliac chain.

Between the lymphatic plexus and nodes are numerous peri-vesical nodes and intercalating nodes whose number and location are variable. They are found mainly along the course of the inferior vesicle differential and prostatic branches of inferior vesical and middle haemorrhoidal arteries *(Harrison and Clouse, 1989).*

Bladder cancer has been shown to metastasize most often to the obturator (73.4%), external iliac (65%), hypogastric (17%), and peri-

vesical lymph nodes (16%). The relative frequency of each of these groups is dependent upon specimen labeling and separate identification of hypogastric or peri-vesical lymph nodes, which often is not done in a consistent manner *(Smith and Whitmore, 1981)*.

PELVIC FASCIA

The prostate is covered with two distinct and separate fascial layer: Denonviellier's fascia and the lateral pelvic fascia. The surgeon must be acquainted with the concept of Denonvillier's fascia which is filmy delicate layer of connective tissue located between the anterior wall of the rectum and the prostate. This fascial layer extends cranially to cover the posterior surface of the seminal vesicle and lies snugly against the posterior prostatic capsule.

The fascia is most prominent and dense near the base of the prostate and seminal vesicles; it thins as it extends caudally to its termination at the recto-urethralis musculature. Microscopically, it is impossible to discern a posterior and anterior layer to this fascia *(Jewett et al., 1972)*. Thus, this fascia should be excised completely to obtain an adequate surgical margin. In addition to Denonvillier's

fascia, the prostate is also invested with a second important layer of fascia, the lateral pelvic fascia, which covers the levator ani musculature. This fascia has also been called the prostatic fascia or parietal layer of endopelvic fascia. Anteriorly and anterolaterally, this fascia is in direct continuity with the true capsule of the prostate. The major tributaries of the dorsal vein of the penis and Santorini's plexus travel within this fascia. Posteriorly, the lateral pelvic fascia separates from the prostate to travel immediately adjacent to the levator and musculature surrounding the rectum. The prostate receives its blood supply and autonomic innervation through the leaves this fascia. In performing radical perineal prostatectomy, the lateral pelvic fascia is reflected off the prostate in an effort to avoid the dorsal vein and Santorini's plexus once the posterior surface of the prostate has been exposed. The next procedure where the fascia coming from the lateral wall of the pelvis divides to encircle the prostate. By making an incision through the posterior layer close to the prostate one can then, by blunt dissection, easily separates the anterior layer from the prostate on each side until the membranous urethra is reached. In performing radical retropubic prostatectomy, the prostate is approached from outside the lateral fascia; for this

reason the dorsal vein complex must be ligated and the lateral pelvic fascia must be divided *(Smith and Whitmore, 1981).*

BLOOD SUPPLY OF THE GUT

The blood supply of the jejunum, ileum and large intestine comes mainly from the superior and inferior mesenteric arteries as follows:

Jejunum and ileum are supplied by the jejunal and ileal branches which are branches from the superior mesenteric artery. They are 12-15 in number. They run in between the two layers of the mesentery each artery dividing into two branches which anastomose with the neighboring ones to from a series of arterial arcades. Branches from theses arcades arise and re-branch again to from a second series of arcades and the process may be repeated. In the upper quarter of the mesentery, one series of arcades is found. In the second quarter of the mesentery, two series of arcades are found. In the third quarter, three series are present while in the lower quarter four series are present.

The terminal part of the ileum is supplied by the ileal branches from the ileocolic artery which is a branch from the superior mesenteric artery.

The lower third of the ascending colon is supplied by the ascending branch of the ileocolic artery which is a branch from the superior mesenteric artery. The caecum is supplied by the anterior and posterior caecal arteries which are branches from the ileocolic artery. The caecum is supplied by the anterior and posterior cecal arteries which are branches from the ileocolic artery.

The vermiform appendix is supplied by the appendicular artery which is a branch from the ileocolic artery. The appendicular artery passes behind the terminal part of the ileum and runs through the free margin of the mesoappendix.

The upper two-thirds of the ascending colon and the right colic flexure are supplied by the right colic artery which is a branch from the superior mesenteric artery. The transverse colon is supplied by the middle colic artery from the superior mesenteric artery. The left third receives blood from the anastomosing branch from the left branch of the middle colic artery from the superior mesenteric artery,

with the ascending branch of the superior left colic from the inferior mesenteric artery.

The left colic flexure and the upper part of the descending colon are supplied by the superior left colic artery from the inferior mesenteric artery.

The lower part of the descending colon and the sigmoid colon are supplied by the sigmoid arteries which are branches from the inferior mesenteric artery. Branches from the sigmoid colon enter the pelvic mesocolon and form a series of arcades which give branches to the colon *(Jewett et al., 1972)*.