POST - PROSTATECTOMY BLEEDING

Essay

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By

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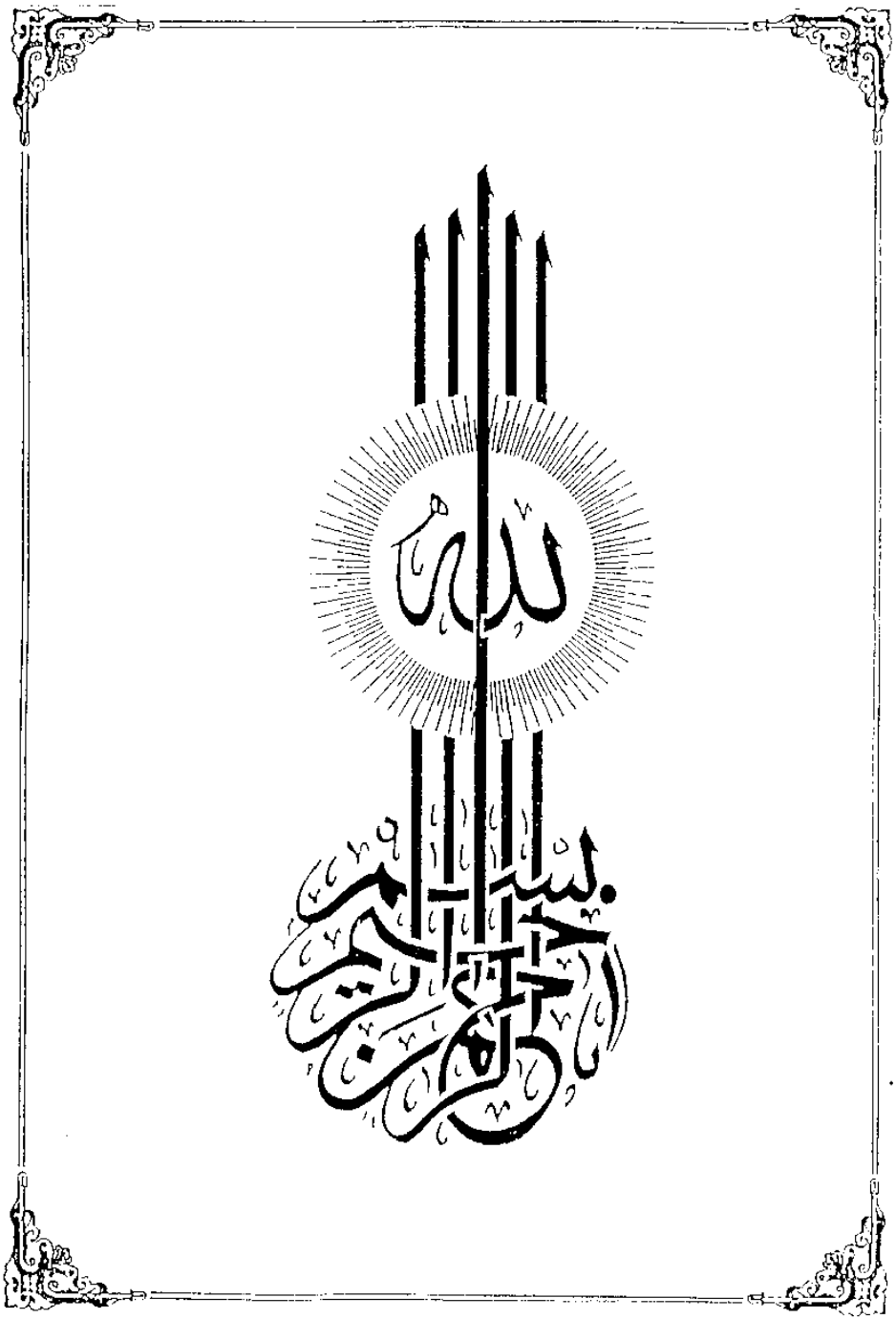
To my Parents

FOR THEIR LOVE, DEVOTION
AND INSPIRATION THEY GAVE ME



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Nashat Rizk

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Introduction

INTRODUCTION

The ability to skillfully conduct operative procedures upon the prostate is one of the fundamental and distinguishing features of urology as a surgical specialty. Potentially critical adjuncts to the routine surgical procedure include patient selection, preoperative evaluation and preparation, intraoperative refinements and adjustments, and practical conservatism regarding convalescence and follow up care. Elective prostatic surgery is now approaching its centennial. Although many changes have evolved, the dominant complications are the same today as they were at the beginning, ie, infection and hemorrhage. A multitude of factors have combined to permit reduction in mortality from a figure initially exceeding 25%, with virtually guaranteed morbidity and prolonged convalescence, to a current mortality of less than 1% and a postoperative course typified by only nominal and brief morbidity. This progress is the result basically of improved anesthesia, the availability of many therapeutic remedies for septic complications, and sophisticated techniques of blood and blood product replacement. As a consequence , most urologic surgeons concur that control of intraoperative and postoperative hemorrhage represents the single most demanding aspect of prostatic surgery. Although securing hemostasis is a typically routine matter, there occurs the periodic circumstance in which local bleeding is excessive in both degree and duration, taxing one's resources of knowledge, experience, and technical skill.

Gross "general" anatomy

The Prostate

Gross "General" Anatomy

The adult prostate is a firm, elastic gland presenting the shape of a truncated cone or horse shoe-shaped chestnut that is flattened antero-posteriorly. The prostate varies in size, an average measurement being: length, 3.4 Cm ;width, 4.4 Cm ; and thickness, 2.6 Cm (Lich et al 1979).

It is situated in the lesser pelvis at a low level behind the inferior border of the symphysis pubis and the pubic arch and anterior to the ampula of the rectum, through the wall of which it may be palpated. It surrounds the commencement of the urethra in male, to which it passes its secretion, and is transpierced by the ejaculatory ducts. It is some what conical in shape, and thus presents for examination a base or vesical aspect, an apex, posterior and two inferio lateral surfaces (Warwik and Williams, 1973).

The base or the superior surface is triangular and slightly concave and is directed upwards and is applied to the neck of the bladder. It is partially separated from the bladder by a circular groove in which fat , fascia and veins are lodged (Prostatico-vesical plexus of veins) and the base is wider lateraly than posteriorly. The base is pierced by the prostatic urethra near to the anterior border of the prostate. Two ejaculatory ducts enter the gland in a concavity at the junction of the base posteriorly and the posterior surface of the gland behind the neck

of the bladder. The pubo-prostatic ligaments are connected with the front and sides of the base of the prostate (Connelly, 1977 and lich et al , 1979).

The apex is directed inferiorly back wards and is in direct contact with the fascia on the superior aspect of the sphincter urethrae and transversus perinei muscles (upper layer of the urogenital diaphragm). The urethra emerges through the anterior border of the prostate a little antero-superior to the apex of the prostate (Connelly, 1977).

The anterior surface of the prostate is transversely narrow and convex. It extends from the apex to base. It intervens between the two infero-lateral surfaces of the prostate. It lies deep and about an inch from the lower part of the symphysis pubis from which it is separated by a quantity of loose adipose tissue and plexus of veins. Near its superior limit it is connected to the pubic bones by the puboprostatic ligaments (Warwik and Williams, 1973).

The infero-lateral surfaces are prominant and slightly convex. They are related to the anterior part of the pubo-coccygeus component of the levator ani muscles, which are however, separated from the prostate by a plexus of veins embeded in fibrous tissue which forms the lateral part of the sheath of the gland.

The posterior surface of the prostate is broad flattened, triangular in shape and vertically convex. It is

separated by its sheath and some loose connective tissue (fascia of Denonvillier's) from the lowest part of the front of the rectum, and is about 4 CM from the anus. Near its upper border there is a depression through which the two ejaculatory ducts enter the prostate. This depression serves to divide the posterior surface into a larger inferior and a superior smaller part. The latter belongs to the median lobe of the prostate, which intervens between the ejaculatory ducts and the urethra, it varies greatly in size, and in some cases devoid of glandular tissue. The inferior, larger area, presents a shallow median furrow which makes a partial separation, of the prostate into right and left lobes, these form the main mass of the gland and are directly continuous posterior to the urethra , they are connected infront of the urethra by the isthmus (aband of fibromuscular tissue devoid of glandular substances) (Warwick and Williams, 1973).

The Covering of the Prostate

The prostate posses two coverings, the prostatic capsule and the fascial sheath of the pelvic fascia.

The true capsule:

The prostate posses a true capsule which consists of a dense tough firmly adherent fibromuscular layer that is continous with muscles of the bladder and the urethra. The true capsule is distinct from the fascial sheath of the prostate.

The capsule is richly supplied with blood vessels, lymphatics and nerve fibres. It sends prolongation into the interior of the parenchyma of the gland seprating the external portion of the gland into lobes whose apices converge towards the posterior urethral orifice. The inner portion of the prostate is not lobulated (periurethral gland) (O'Conor, 1979).

The fascial sheath:

The prostate is covered with two distinct and seperate fascial layers: Denonvilliers' fascia and the lateral pelvic fascia.

The Denonvilliers' fascia, is a 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 vesicles and lies snugly against the posterior prostatic capsule. The fascia is most prominant and dense near the base of the prostate and seminal vesicles; it thins dramatically as it extends caudally to its termination at the rectourethralis musculature. Microscopically it is impossible to discern a "posterior" and " anterior" layer to this fascia.

In addition to Denonvilliers' 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 the parietal layer of the 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 ani musculature surrounding the rectum. The prostate receives its blood supply and autonomic innervation through the leaves of this fascia. In performing radical perineal prostatectomy, the lateral pelvic fascia is reflected off the prostate in an effort to avoid the dorsal vein of the penis and Santorini's plexus. Avoiding these veins accounts for the reduced blood loss associated with radical perineal prostatectomy (Walsh, 1986).

In the operation of suprapubic prostatectomy the surgeon enucleates the prostate from both its capsule and fascial sheath so that the prostatic plexus of veins is undisturbed (Warwick and Williams, 1973).

Anatomic Structure of the prostate:

The prostate is a composite structure which includes glandular elements and a stroma of collagenous and muscle tissue. The prostate is invested by fibromuscular capsule, distinct from the sheath derived from the pelvic fascia. This capsule is best developed on the anterior and antero-lateral aspect. The tough fibromuscular capsule of the prostate sends prolongation into the interior of the gland separating the external portion into lobules whose apices converge toward the posterior urethral surface (Lich et al, 1979).

Musculature of the prostate:

It forms the stroma of the prostate. The connective tissue of the stroma being very scanty and nearly forming between the muscle fibres thin trabeculae in which the vessels and nerves of the gland ramify.

The muscular tissue is arranged as follows:
Immediatly within the capsule there is a dense layer of muscle fibres, which encircles the gland. Around the prostatic part of the urethra a dense layer of circular