RECENT ADVANCES IN MANAGEMENT OF PROSTATIC CARCINOMA

THESIS

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BY

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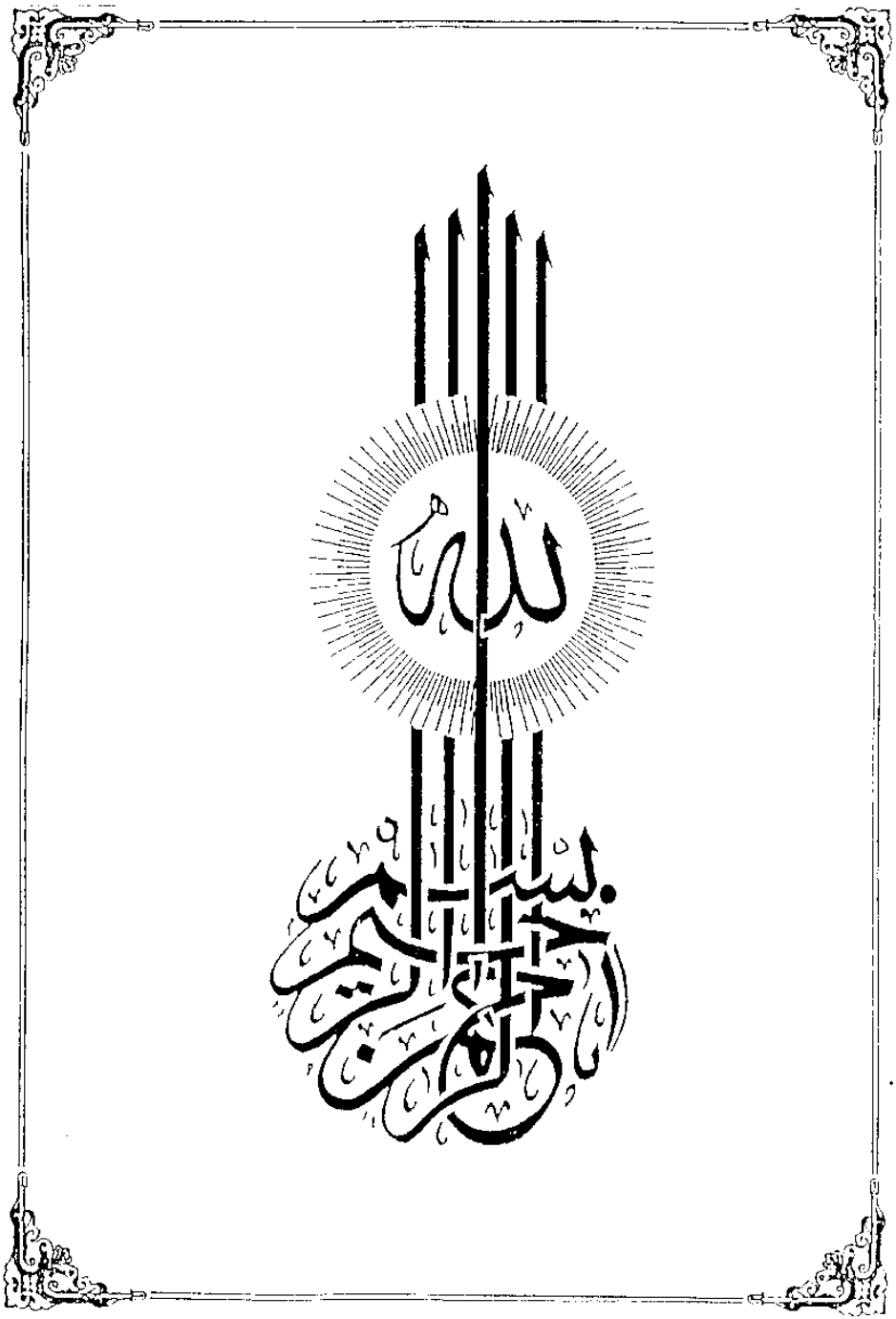

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EMBRIOLOGY

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The prostate develops as multiple solid outgrowths of the urethral epithelium both above and below the enterance of the mesonephric duct. These simple, tubular outgrowths begin to develop in 5 distinct groups at the end of the eleventh week and are complete by the sixteenth week (112 cm). They branch and rebranch, ending in a complex ductal system that encounters the differentiating mesenchymal cells around this segment of the urogenital sinus. These mesenchymal cells start to develop around the tubules by the sixteenth week and become denser at the periphery to form the prostatic capsule. By the twenty-second week, the muscular stroma is considerably developed and continues to progressively increase until birth.

From the 5 groups of epithelial buds, 5 lobes are eventually formed: anterior, posterior, median and 2 lateral lobes. Initially these lobes are widely separated but later they meet with no definite septa dividing them. Tubules of each lobe do not intermingle with each other but simply lie side by side.

The anterior lobe tubules begin to develop simultaneously with those of the other lobes. Although in

the early stages the anterior lobe tubules are large and show multiple branches, gradually they contract and lose most of these branches. They continue to shrink so that at birth they show no lumen and appear as small, solid embryonic epithelial outgrowths. In contrast, the tubules of the posterior lcbe are fewer in number yet relatively larger, with extensive branching. These tubules as they grow, extend posterior to the developing median and lateral lobes and form the posterior aspect of the gland, which may be felt rectally.

ANATOMY OF PROSTATE

ANATOMY

The prostate is fibromuscular and glandular organ lying just inferior to the bladder. The normal weight about 20 gm. and contains th posterior urethra, which is about 2.5 cm in length. It is supported anteriorly by the puboprostatic ligaments and inferiorly by the urogenital diaphragm. The prostate is perforated posteriorly by the ejaculatory ducts which pass abliquely to empty through the verumontanum on the floor of the prostatic urethra just proximal to the striated exteranl urinary sphincter.

LOBULES

According to the clssification of Lowsly the prostate consist of 5 lobes anterior, posterior, median, right lateral and left lateral.

Anterior lobe: on anterior wall of urethra, the gland element are few and gradually disappear until at birth, the lobe of prostatic gland thus formed has no surgical significant.

Median or Prespermatic lobe:originate in posterior surface of the floor of urethra just superior to the internal opening of ejaculatory ducts. The lobe therefore is

posturethral & prespermatic. The gland grow backward & upward toward's the bladder. Median lobe hypertrophy leads to urinary obstruction by pushing the urethra forward at the apex of the trigone. When this lobe hypertrophies upward it lifts the bladder mucosa that is behind the urethral orifice dilates and destroys the internal sphincter. Sometimes it give rise to a large, irregular mass that seriously deform the bladder orifices, hinder spontaneous urethral evacuation.

Two Lateral Lobes: as tubular out growth from the prostatic furrows on lateral wall of the urethra. They expand laterally, anteriorly, posteriorly and upward until they occupy most of the base or upper portion of prostate.

Hypertrophy of lateral lobes causes urinary obstruction by lateral enchroachment on the prostatic urethra which deviated laterally and increase in length.

Posterior Lobe : The tubules of origen of posterior lobe arise in posterior wall of urethra inferior to orifices of ejaculatory ducts and grow superiorly to occupy or plan behind the duct. As they grow upward toward the base of the bladder, they are both post uterhral and post spermatic. It is separated by fibrous interlobar portions. It forms posterior surface of gland so can palpate by P.R.. Enlargement is very rare.

Prostatic adenoma develope from periurethral glands at the site of the median or lateral lobes. The posterior lobe however is prone to cancerous degeneration.

Subcervical Gland: develops beneeth the mucosa of urethra just outside the bladder but within the confives of internal urethral sphinecter. As they are proximal to internal sphinecter. These position is most important since even increase in size may leads to marked interferance with passage of urine from the bladder.

PROSTATIC URETHRA:

about 3 cm long traverse the gland from base to apex that is from internal urethral orifice to the superior layer of urogenital diaphragm (Triangular ligement).

There it is continous with the memberanous portion. It does not follow the axis of the prostate, but lies much nearer to the anterior than posterior surface.

The lumen of the urethra, although admitting of considerable dilation, normally is obliterated by approximation of its anterior and posterior walls. It appears in cross section as a horizontal slit save where the seminal colliculus (Verumontanum) bulges forward from the posterior urethral wall.

Urethral Crest: extend along the posterior wall or floor of the uerthra from its origin on the vesical trigone to its termination at the membranous urethra. On each side of the crest is a depressed fossa, the prostatic sinus, the floor of which is of the prostatic ducts.

The verumontanum the greatest prominence of the urethral crest has over the middle of the prostatic urethra where the lumen of channel, because of the formed projection of the colliculus appears cresentric in out line. It is surmounted by the slit like opening of the prostatic utricle. The Cul-de-sac of the prostate utricle is directed backward & upward a variable distance (10-12 mm) into prostate.

Upon the verumontanum and lateral to edges of the lips of the utricle open the orifices of ejaculatory ducts. The verumontanum may cause constriction or oblitration of the ejaculatory ducts.

FASIAL RELATIONS OF PROSTATE

a) Capsules :

True and false capsules. True formed by condensation at periphery of gland. Cabot and others deny its existance. They say that an adenomatous prostate shells out because the non-adenomatous tissue is pushed to the periphery of the gland and the adenomata are shelled out of this compressed gland tissue. The false capsule is formed by the visceral layer of pelvic fascia which gives a sheath common to bladder and prostate and is absent where the two organs are in contact. For this reason adenomata of the prostate tend to grow upwards into the bladder, this being the line of least resistance. The pudendal plexus of veins (prostatic) lies between the two capsules and recives in front the deep dorsal vein of penis.

b) Fascia behind the prostate:

The peritoneum of the pelvic floor extend down as a pouch behined the prostate. This pouch is ultimately shut off from the peritoneal cavity and exists as two layers of fascia with potential space between them. These two layers are attached to peritoneum (floor of Douglas pouch) above and to the urogenital diaphragm and perineal body below. This is the fascia of "Denonvilliers" (prostatoperineal fascia). The anterior of these two fascial

layers is firmly attached to the prostate. The posterior layer is not quite so firmly blended with sheath of the rectum.

The potential space between the fascia is the space of Denonvilliers.

c) Recto Urethralis :

This consists of two bundles of muscles, recto-urethralis superior and inferior. They hold the ano-rectal junction forward, angulating it to form the rectal angle. They are both attached to the upper part of the perineal body.

BLOOD SUPPLY

1. Arterial:

a) Inferior vesical artery rt & lt.

at the junction of bladder base and prostate it terminate into 2 large groups of prostatic vessels on each side of midline.

- Internal or uretheral group: which supply central part, posterior part of bladder neck and periurethral gland.

- Capsular groups: enter the gland laterally and supply peripheral part of prostate.

b) Others:

- Base from vesiculo-differential artery.
- Anterior surface from inferior vesical artery.
- Posterior surface from middle rectal artery.
- Apex from internal pudendal artery.

c) Arterial anomalies:

- Accessory pudendal artery by peircing the lateral part of bladder & prostate.
- Abnormal dorsal artery of penis to apex.
- Abnormal obturator artery to anterior aspect.

2. Venous :

Veins which drain communicate with branches from deep dorsal vein of penis and with veins from other sources to form 2 venous plexuses. One is located anterioly and 2 are located lateral to prostate on each side which communicate with vesical plexus and with internal pudendal vein and drain into vesical and internal iliac veins.

Almost all venous drainge from prostate is directly to inferior vena cava & few posterior tributaries enter portal circulation.