INJURY TO THE MALE POSTERIOR URETHRA IN FRACTURE PELVIS

THESIS

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By
ATA LOTFI EL-BAYOMI
M. B., B. Ch.

Supervised by
Prof. Dr. IBRAHIM A. RAGI
Professor of Urology
Faculty of Medicine, Ain Shams University

Urology Department
Faculty of Medicine
Ain Shams University

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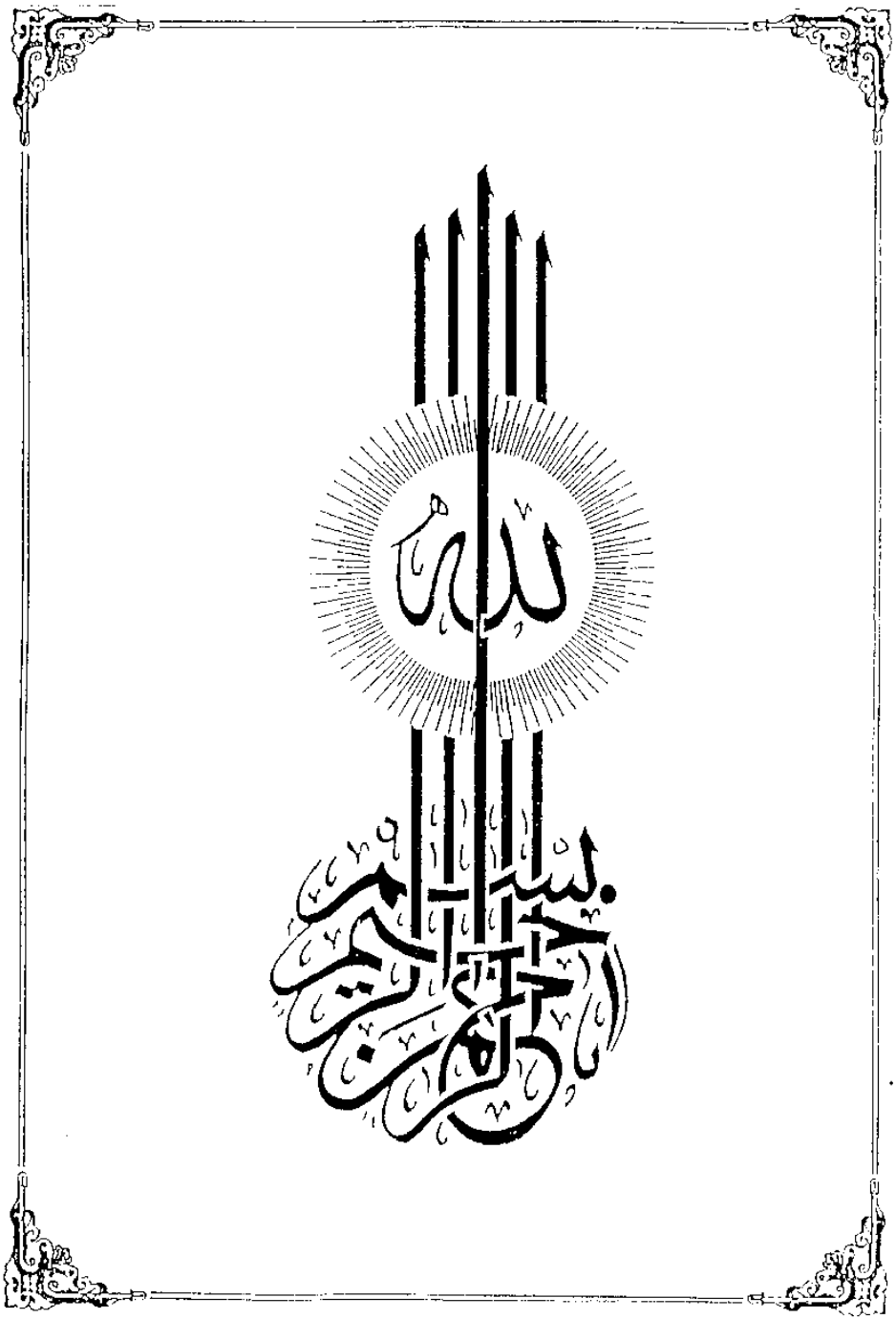
Didicated

To the sole of my father



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INTRODUCTION AND AIM OF THE WORK

With the increasing number of R.T.A. there is a corresponding increase in the number of accidents causing significant body trauma, among which are urethral injuries.

Urethral injury is uncommon, and for anatomical and aetiological reasons, it afflicts the adult male more often than women or children.

As regards injuries to posterior urethra, the pelvic crush is the leading cause in most series.

- In pelvic crush injuries the bladder is at risk in either sex, but the urethra usually escapes damage in females.
- In contrast in the male, the urethral injury may dominate the immediate clinical picture, and colour the subsequent course of the patient's life for years, perhaps even for the rest of his days.
  This is because it carries a high and often permanent morbidity for the patient. It frequently results in severe obliterative disease of the urethra.

In most series injuries to posterior urethra outnumber those of anterior urethra:

- This is unfortunate as posterior urethral injuries is more difficult to treat.

- And indeed few areas in urology generate as much controversy as management of this type of genito-urinary trauma.

Controversy surrounds the evaluation and the treatment of posterior urethral injuries. And although much has been reported on the management of urethral injuries, there still are conflicting, if not divergent, views on the proper approach to management.

The management of such injuries poses one of the most difficult problems in urology. And to decide the proper treatment of his patient:

1. The urologist must have some historical perspective as to the development of today's recommended treatment options.
2. He must be totally honest as to his own ability to treat the injured patient.

Most urologists have little experience in this area and after initial management, would be advised to refer the patient for definitive surgical care to a center where these cases are commonly dealt with.

Our aim of work in this paper is to study and discuss injuries to posterior urethra mainly after fracture pelvis.

EMBRYOLOGY

DEVELOPMENT OF MALE URETHRA

The cloaca is defined as that part of hindgut which lies caudal to the attachment of the allantois.

During the 5th week, the mesoderm accumulates on the dorsal side of allantois as urorectal septum in 4 - 6 mm embryo.

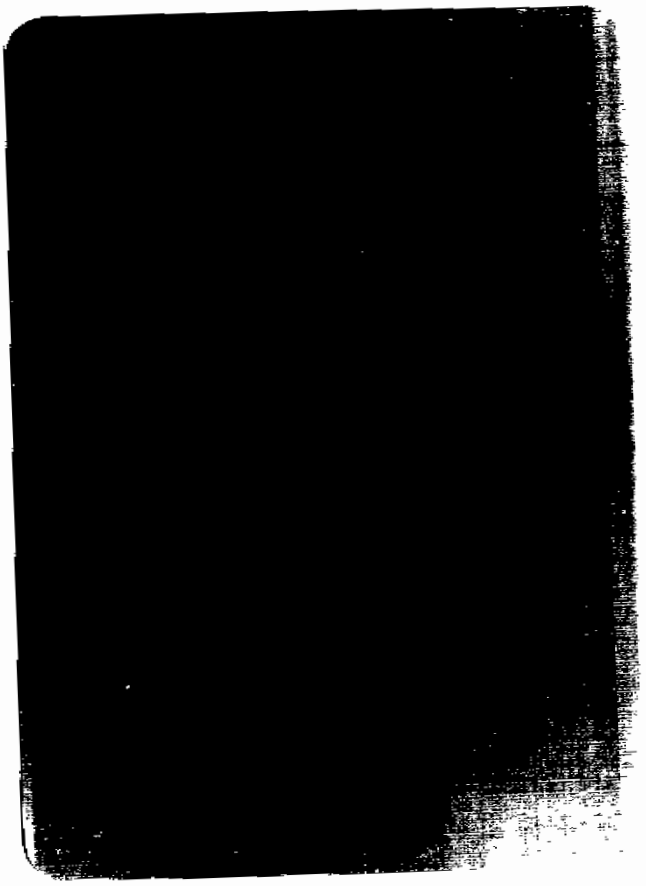
The septum grows caudally to meet cloacal membrane:

- The lateral sides of urorectal septum reach the cloacal membrane by 10mm crown-rump stage.
- Complete separation of the cloaca into primitive urogenital sinus ventrally and rectum dorsally occurs at 12mm crown-rump stage i.e. in 6-7 week embryo.

Immediately prior to complete septation, a channel connecting rectum and primitive urogenital sinus is present on the cranial aspect of cloacal membrane.

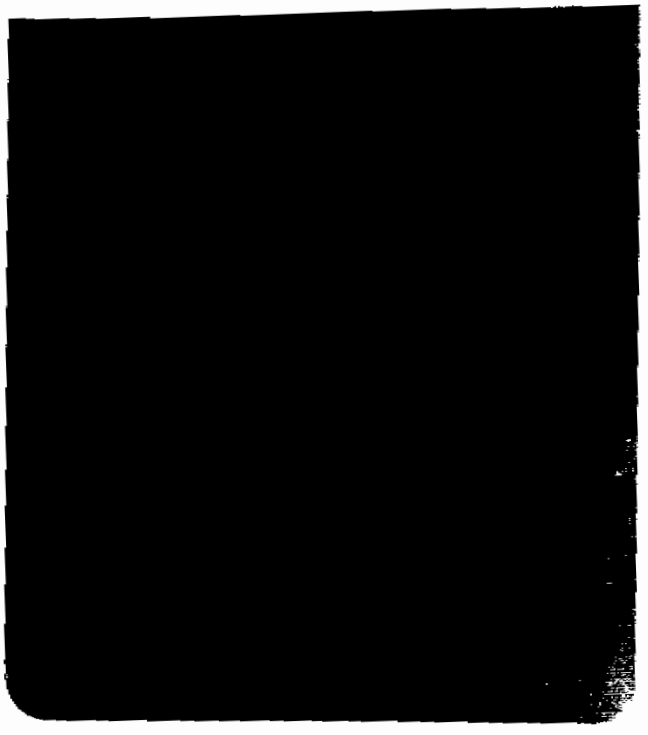
Persistance of this channel "cloacal duct" occurs due to failure of further growth of urorectal septum resulting in a fistula between the rectum and urethra.

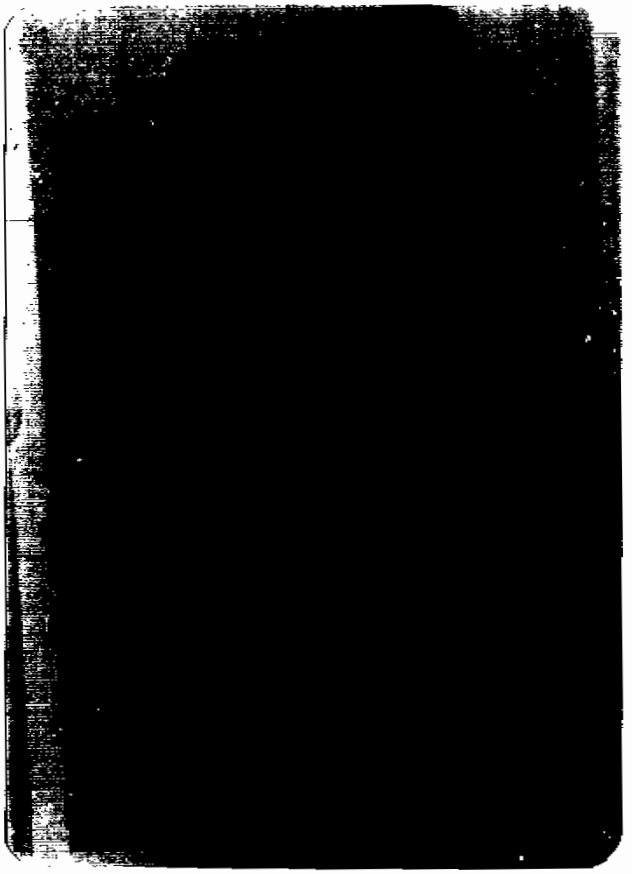
On reaching cloacal membrane, urorectal septum divides it into urogenital membrane and anal membrane.



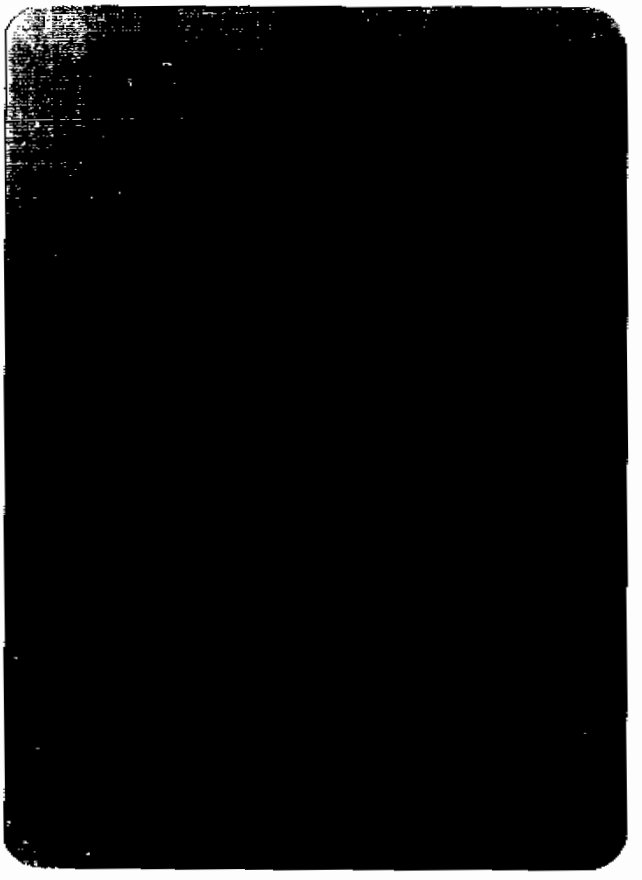
The Cloaca (4-5mm CRL embryo):

- The cloacal membrane is located at the base of the connecting stalk.
- The mesonephric duct opens into the cloaca ventral to the urorectal septum.





Separation of cloaca (9mm CRL embryo):
The cloacal membrane faces caudally and is approached by the urorectal septum.



The anal and urogenital openings are formed by independent involution of these membranes, a process which is complete by 18 mm crown-rump stage.

The mesonephric duct opens into urogenital sinus.

In male, formation of urethra is more complex than in female. It is associated with the development of external genitalia.

Formation of the bladder and primitive urethra:

The primitive urogenital sinus is divided by entrance of mesonephric ducts into:

1. Vesico-urethral canal.
2. Urogenital sinus proper.

1. Vesico-urethral canal

It is that portion of primitive urogenital sinus that lies between the terminations of the common excretory ducts and the allantois and undergoes dilatation.

It is this structure from which the urinary bladder develops:

- Mucosa of bladder arises from endodermal lining of vesico urethral canal
- Vesical musculature from its splanchnopelbic mesoderm.

The common excretory duct of each side gradually becomes absorbed, by growth changes, into the dorsal wall of vesico urethral canal.

As a result the mesonephric ducts and ureters come to open separately into the canal in embryo of about 10-12 mm. crown rump length.

The precise mechanism whereby the ureters and mesonephric ducts open separately remains a controversial issue.

As development progress, the ureteric orifices move cranially and laterally in relation to the mesonephric openings which not only remain close together but also migrate caudally. With the lateral displacement of ureteric orifices, a well developed trigone can be distinguished by 14 - 16 mm crown-rump length.

The terminal parts of the mesonephric ducts open on the surface at a midline elevation "Müllerian tubercle" which is situated on dorsal wall of the urethra.

Concomitant with the separation of the ureters from the mesonephric ducts, there are marked changes in the shape of vesico-urethral canal.

1. Upper part dilates to from the bladder.
2. Lower part remains narrow forming the primitive urethra.

Fate of primitive urethra:

It forms that part of prostatic urethra which extends from internal urethral orifice to the entrance of common ejaculatory ducts. "Supramontanal portion of prostatic urethra."

2. Urogenital sinus proper:

After its establishment, it is divided into:

1. Narrow, vertical, pelvic part which forms
   - Lower part of prostatic urethra below entrance of common ejaculatory ducts "Inframontanal portion".
   - Membranous urethra.
   - From this pelvic part and from primitive urethra many epithelial buds penetrates the surrounding mesoderm. They proliferate further to form glandular tissue of prostate gland.

N.B.:

1. The development of prostate is completed by a fibromuscular element or contribution from mesoderm.
2. Glands of median lobe are derived from posterior urethral wall which may be of mesodermal origin from mesonephric duct epithelium.