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ADVANCES IN THE APPLICATION AND ACHIEVEMENT IN THE ART OF VISUAL INTERNAL URETHROTOMY

THESIS
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M.D. Degree In Urology

BY

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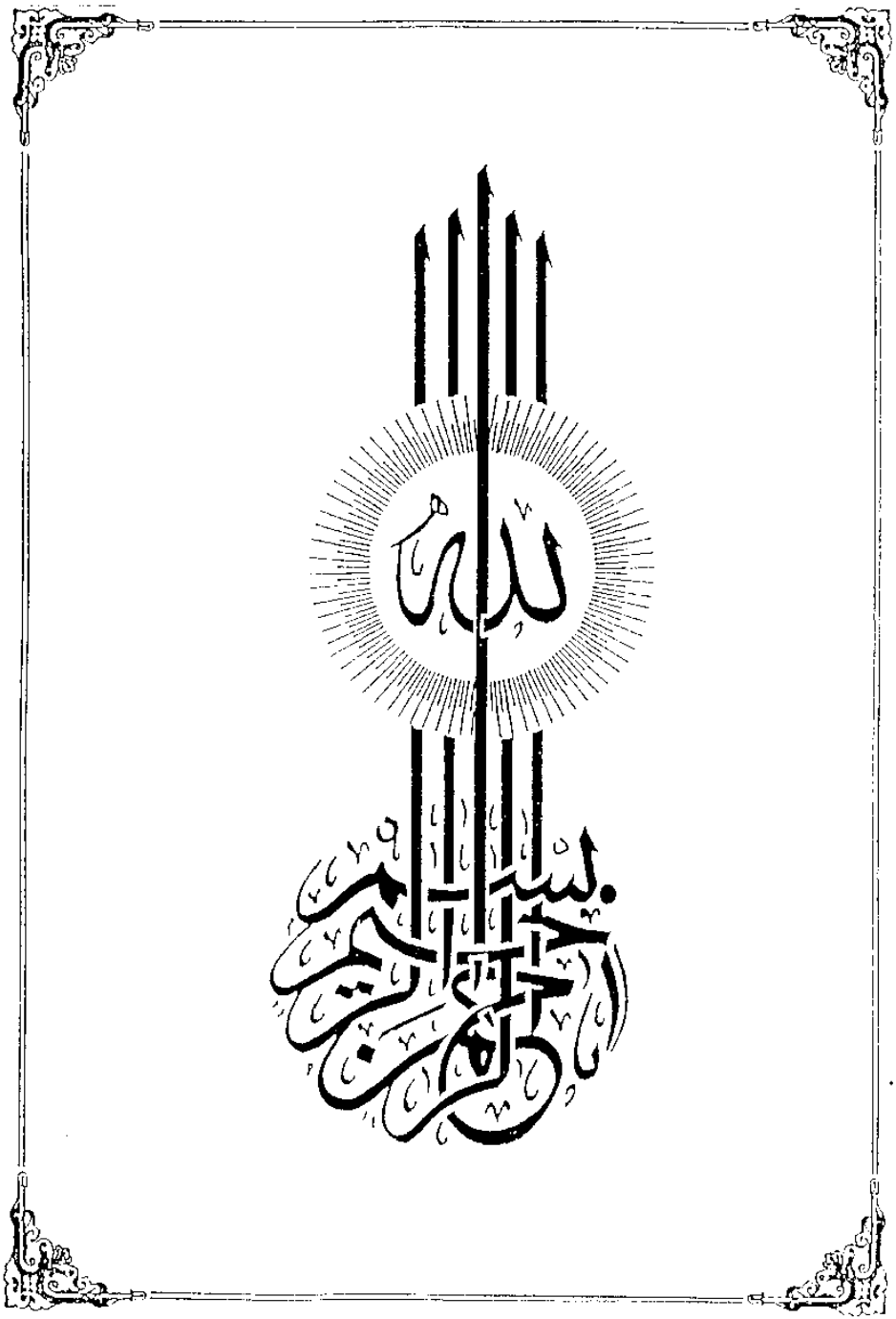

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Introduction

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Urethral stricture is probably one of the oldest problems for which man has attempted to find a remedy.

Stricture of the urethra has been treated by periodic urethral dilation using blind bougies and dilators for ages. Internal urethrotomy eigther blind or visual together with reconstructive urethroplasty stepped in only recently. Although much has been done in the past 20 years using different techniques for urethroplasty, not a single technique is completely satisfactory. Multiplicity means high percentage failure or different applicability of a type of plasty to a type of stricture or according to variable condition.

With the introduction of the modern fibroptic endoscope, visual internal urethrotomy was introduced for stricture management. As a matter of fact, it has been considered and established during the last two decades to be "adjuvent" or as "a step" in the strategy of other methods. Although the initial indication was for short segment single stricture, with the developing experience of urologist, the indication have been extended to include longer segament and multible strictures.

Recently, visual urethrotomy could be considered as the main method of handling in different types and extents of strictures, stenosis and obstructive lesions wheather their pathogenesis is. Consequently, surgery will be an adjuvent maneuver in only very sporadic cases.

Only with a background of an extensive experience during the last 10 years made it possible to develop different versions in the technique of visual urethrotomy and develop a well defined strategy for application in different conditions in our three years thesis.

The philosophy developed with the experience of my supervisor, considers every case as an entity needing special strategy based on :

- Loss of continuity.
- Circumfrential or sectional reduction.
- Degree and extent of periurethral scarring.
- Availability of urethral lining for regeneration.

In our study sonourethrography has helped much to domenstrate the status quo of the urethra and periurethral tissue with more data about the degree and extent of the strictures.

It's now possible to forcast the ability of re-epithelisation ability of the scelerosed urethral and periurethral tissue. Consequently technique will be put forward accordingly to the circumstances with the potential success and prognostic passage releif.

Historical Background

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Urethral strictures have affected man since time immemorial . The recorded history of stricture treatment dates back to the sixth century BC, when the use of wooden or metal dilators described in the Ayurveda .

Over the last two millennia a range of methods of cutting strictures have been developed . In the sixteenth century Ambroise Pare developed a long sharp lancet to "reduce excrescences" in the-urethra .

In 1795, the appropriately named Dr. Physick of philadelphia described his lancellated catheter, this was followed in 1817 by Jean Civiale's sound with a bulb containing a blade .

Instruments devised to perform blind urethrotomies were designed by Maisonneuve in 1854 [a filliform with urethrotome] and by Fessenden N. Otis in 1872. Otis developed calibrating catheters and sounds and went on to design the two bladed dilating urethrotome with a cutting blade much as we know it today .

The direct-vision optical urethrotome was developed in the 1950s in stages . At first, Ravasini in 1957 developed urethrotomy by using electric diathermy . Sachse introduced the optical endoscopic urethrotome as it is currently known in 1974 .

History of Corrective and Reconstructive Surgery For Urethral Stricture

Le Dran is reputed to have the first excision of a stricture in 1744 . Ducas in 1835, can perhaps be given the credit for the first recorded excision of a urethral stricture .

Agusner carried out the first excision of the stricture with restoration of the urethral continuity by suture in 1883 . Guyon in 1891 described excising part of the stricture leaving a strip of doral wall in continuity .

Hamilton Russel in 1911 aimed at creating an artificial hypospadias. In 1915 Russell excised a stricture and spatulated the ends of the remaining urethra, joining them at the ventral surface of the urethra .

In 1950, Johanson adapted the Denis Brown hypospadias operation to the treatment of adult urethral strictures incising the strictured urethra until well into normal urethra on each side and suturing the cut edges of the urethra to adjacent skin edges .

In 1986, Blandy described pedicled scrotal skin. Also, Turner Warwick in 1987 decribed pedicled penile skin paches for management of stricture urethra .

Most recently high energy laser technology has been applied to this persisting and resistent problem .

[McNicholos, 1990]

Anatomy

- Anatomy of the urethra
- Anatomy of the sphincters
- Anatomy of pub-urethal space
- Anatomy of perineum
- Sectional anatomy of the penis

ANATOMY

I. Anatomy of the urethra.

II. Anatomy of pubo-urethral space.

III. Anatomy of the sphincters.

IV. Anatomy of perineum.

V. Sectional anatomy of the penis.

1 Anatomy of male urethra :-

The male urethra range from 18-20 cm long, extends from internal orifice in the urinary bladder to the external meatus at the tip of the penis. [Fig 1].

Male urethra is considered in five regional parts :-

a) Pre prostatic urethra.

b) Prostatic urethra.

c) Prostatomembranous urethra.

d) Membranous urethra.

e) Sponginose urethra.

When the penis in its flaccid state, the urethra present double curve.

Except during voiding, the urethral canal is a mere slit. In the prostatic part, it's transversely arched, in the membranous portion it's stellate, in the spongiose part it's transverse while the external meatus is sagital in orientation. [Gray, 1989]

1- a) Pre prostatic Urethra :

The preprostatic urethra is approximately 1-1.5cm in length, extending almost verticaly from the bladder neck to the base of the

prostate gland. The smooth non striated muscle bundles surrounding the bladder neck and pre-prostatic urethra are arranged as distinct circular collar which becomes continous distally with the capsule of the prostate.

The bundles which form this pre-prostatic urethra are separated by connective tissue containing many elastic fibres. Unlike detruser muscle, the non striated muscle of the proximal urethra possesses relatively few cholinergic nerves but is richly supplied with sympathetic nor adrenergic nerves [Gosling & Dixon, 1990].

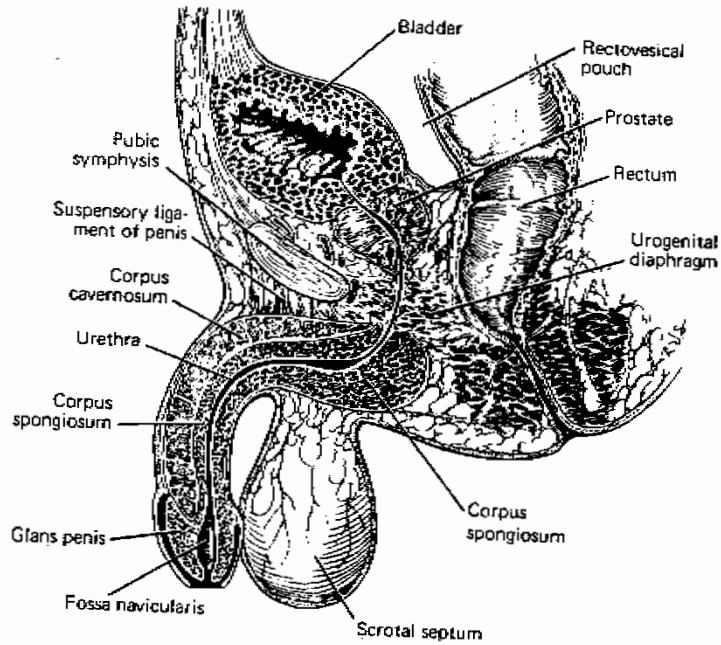
1- b) Prostatic Urethra :

The prostatic urethra is about 3-4cm passing through the prostatic tissue closer to the anterior than the posterior surface of the gland. It's continous above with the preprostatic part and merge from the gland slightly anterior to its apex.

The posterior wall possesses a midline ridge, the urethral crest. On each side of the crest, there's a shallow depression which is the prostatic sinus, the floor of which is perforated by prostatic ducts. About the middle of the crest is the colliculus seminalis or verumontanum, on both sides there are two openings of the ejaculatory ducts.

1- c) Prostato membranous urethra :

It's related together with the membranous urethra to the pubo urethral space.



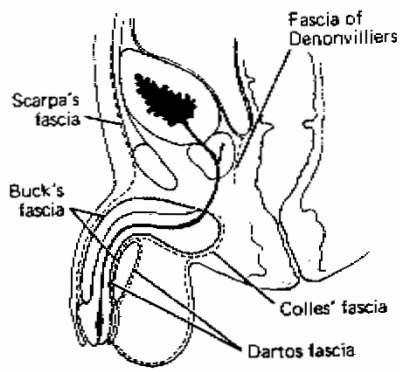


Fig."1": Anatomy of male urethra

1- d) Membranous urethra :

The membranous urethra is the shortest part with the lowest compliance with the exception of the external orifice. It's the least destensible part of the urethra. It descends with slight concavity from the apex of the prostate to the bulb of the penis. It's related to the pubo uretheral space and posterior surface of symphysis pubis.

The wall of the membranous urethra possesses a muscle coat which is separated from urethral epithelium by a layer of fibroelastic connective tissue. The muscle coat consists of two layers, a relatively thin inner layer of smooth muscles bundles and an outer layer of circulary oriented striated muscle fibers. The out layer form the rhabdosphincter of the urethra. The fibers of which are slow-twitch fibers and not easly fatigable so, capable of maintaining continence. [Gosling & Dixon, 1990]

The muscular element of membranous urethra receive innervation from both devisions of autonomic nervous system and from the somatic system.

The bulbo-urethral (cowpers) glands are on both sides of membranous urethra, the ducts of which proceed caudaly to open into the bulbous urethra on each side.

At about 3 and 9 o'clock position, pass the cavernous nerves before they proceed to penetrate the crura of the penis. [Gray, 1989]