PENILE PROSTHESES

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the Master Degree in Urology

By

Magdy Mostafa Ibrahim
M.B., B.Ch.

Supervised By

Prof. Dr. Abdel-Fattah Aggor
Prof. of Urology
Ain Shams University

Prof. Dr. Mohammed Habib
Prof. of Dermatology and Vinereology
Ain Shams University

Dr. Hani Mostafa Abd-Allah
Lecturer of Urology
Ain Shams University

Faculty of Medicine
Ain Shams University
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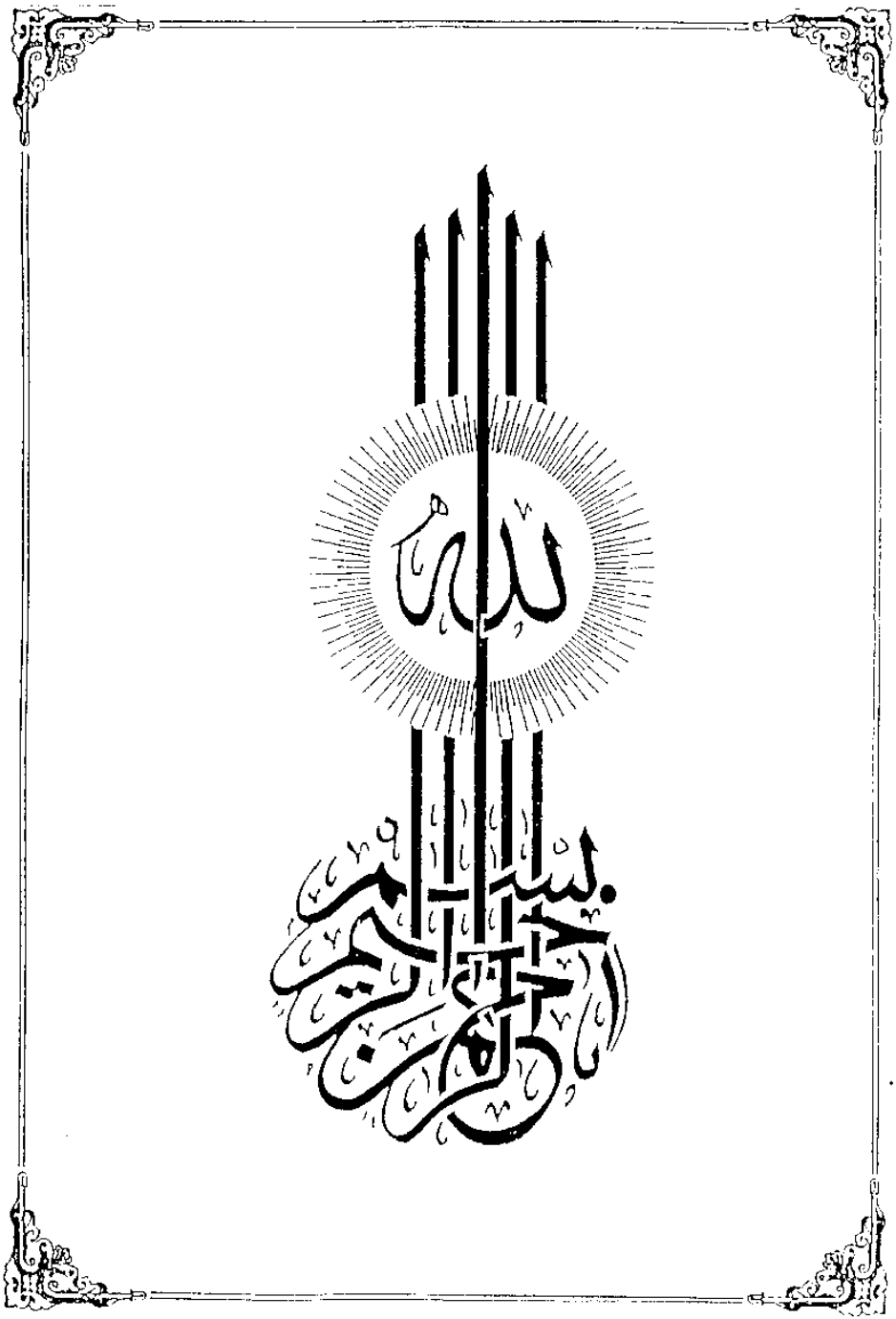

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Introduction and Aim of the work

INTRODUCTION

Penile prosthesis implantation is technically successful in more than 95 percent of cases. Although the implantation of penile prosthesis does not restore normal erection, the success of this surgery in terms of restoration of the ability to have coitus makes penile prosthesis implantation the gold standard with which other forms of treatment will ultimately ***(Drogo, 1989).***

In ***1952, Godwin and Scott*** first used specially shaped acrylic splints as penile implants for impotence and reconstructive penile surgery with success. Thus, the initial use of these splints in a non-penile reconstructive setting was for the management of impotence; however, the splints were not placed intracavernosally. Subsequent to this, other reported success with the perforated acrylic rods for treatment of impotence, referring to their use as the creation of the "artificial os penis" ***(Peter, 1989).***

Surgical implantation of a penile prosthesis has become one of the most accepted modes of management of patients with organic and, when indicated, psychogenic impotence ***(Fishman, 1989).***

AIM OF THE WORK:

This study attempts to evaluate types of penile prosthesis indications and choice of patients for prosthetic surgery.

Review of Literature

Surgical anatomy of the penis

Embryology of external genitalia:

In the early stages of development, the external genitalia are identical in male and female. In the third week the cloacal membrane become gradually surrounded by mesenchyme which forms two slightly elevated folds called cloacal folds. The cloacal folds fuse with each other in front of cloacal membrane to form cloacal eminence. The later becomes longer and called genital tubercle. In sixth week the cloacal membrane is divided into urogenital and anal membranes. In the same time, the cloacal folds are also divided into genital folds in front and anal folds behind. Another pair of elevations called genital swellings are formed on either side of the genital folds. In male, the genital tubercle elongates and forms the phallus. In the female this elongation forms clitoris.

As the phallus elongates it pulls the urethral folds forward so that they come to form the lateral wall of the deep urethral groove which extends along the caudal aspect of the elongated phallus. The endoderm at the bottom of the urethral groove multiplies and forms urethral plate. At the end of the third month the two urethral folds fuse and close over the urethral plate. In this way, the urethral canal of the penis is formed. The later does not extend to the tip of the phallus. During the fourth month, a solid ectodermal cord penetrates from the tip of the penis inward towards the urethral canal. Later the solid ectodermal cord acquires a lumen and forms the glandular part of the urethra.

The two genital swellings form two scrotal swellings which move caudally and each one of them will form one half of the scrotum. Dihydrotestosterone mediates the differentiation of external genitalia from phallic portion of urogenital sinus. Defective fusion of urethral fold on the dorsal aspect of the penis will form epispadius while defective fusion of urethral folds on the ventral aspect of the penis will form hypospadius.

The anatomy of the penis:

The surgical anatomy of the penis will be discussed under two headings, the root and the shaft of the penis.

The root of the penis rests on perineal membrane (urogenital diaphragm) in the superficial perineal pouch. It consists of the bulb and the two crura. The bulb is pierced from behind by the urethra after piercing the perineal membrane and it is also pierced by the ducts of Cowper's glands. It is covered by bulbospngiosus muscle. The posterior fibres of this muscle cover the bulb and is attached to the perineal membrane. The intermediate fibres embrace the corpus spongiosum while the anterior fibres is V-shaped and surround the three corpora of the penis.

The ischiocavernous muscle arises from the ischial arch and covers the crura of the penis and is inserted into it but the two crura are attached to the pubic arches. These structures which form the root of the penis are covered by Colle's fascia which unites behind with the posterior border of urogenital

diaphragm and the two pubic arches to form the superficial perineal pouch which is opened in front.

In the shaft of the penis; the bulb continues in front as corpus spongiosum in the ventral aspect and the penile urethra penetrates this corpus spongiosum. The later enlarges distally to form the glans penis. The later is indented in the proximal surface by the distal ends of corpora cavernosa but actually the later extends in front of the corpus spongiosum on dorsal aspect of the shaft of the penis. A fold of skin extends in front to hide the glans penis named the prepuce which is removed during circumcision but the glans penis itself is covered by modified skin.

The fascia of the penis is very important in the process of erection. The most superficial fascia which lies directly under the skin is Colle's fascia of the penis or Dartos fascia which contains no fat and is continuous with Scarpa's fascia of the abdomen. Under it lies Buck's fascia which surrounds the three corpora of the penis together with the third part of bulbospinogiosus muscle. From Buck's fascia a fibrous septa extend between the pair of corpora cavernosa and corpus spongiosum which are important in anchoring the anterior aspect of the penis in the symphysis pubis as it fuses with suspensory ligament as it joins Colle's fascia posteriorly as triangular ligament.

Each of the three corpora is enclosed in a tough fibrous membrane named tunical albuginea of the corpus. The tunica albuginea of the corpus spongiosum

The venous drainage of the penis has been divided by ***Newman and Northup (1981)*** into three major divisions of veins which are noted at separated levels; superficial, intermediate and deep as well as unnamed emissary, circumflex and communicating vessels. Such vast anastomoses is important because when the contrast material is injected under sufficient pressure it will fill all veins and cavernous spaces. The superficial level of veins includes multiple subcutaneous veins that run deep to Dartos fascia but superficial to Buck's fascia. These contribute to form the superficial dorsal vein in the same plane. This major vessel usually is formed posteriorly and empties into scrotal veins.

The intermediate veins lie deep to Buck's fascia but superficial to the tunica albuginea. They include vina comitantes of dorsal arteries and the most important vessel at this level is the deep dorsal vein. The major contributions forming the deep dorsal vein are 6 to 15 straight vessel from the glans as well as emissary and circumflex veins from corpora cavernosa under normal condition. It passes beneath the arcuate ligament and terminates in the pudendal plexus in the pelvis.

The deep veins of the penis (different from the deep dorsal vein) include bulbar veins that drain directly into the pudendal vein or pelvic plexus, the anterior and posterior urethral veins and deep veins of corpora cavernosa. The anterior urethral vein joins with the posterior emissary vein to produce circumflex vein that travels around the circumference of the penis superficial