Evaluations of Aesthetic and Functional Repair of Primary Distal Hypospadias

Thesis

Submitted in Partial Fulfillment For
The M.D. Degree in (General Surgery)

By

Magdy Ahmed Hassan Sakr
(MB., B.Ch.; MSc. General Surgery)

Supervised By

Prof. Dr. Raffat Riad Gohar
Professor of General Surgery,
Faculty of Medicine, Cairo University

Prof. Dr. Mostafa Ahmed Abo El-Soud
Professor of General Surgery,
Faculty of Medicine, Cairo University

Dr. Waleed El-Moez
Assistant Professor of General Surgery,
Faculty of Medicine, Cairo University

2008

ACKNOWLEDGMENT

Thank forever for ***ALLAH***, the great grantor always gifting us the best.

I would like to express my deep appreciation and gratitude to ***Dr.*** **Raffat Riad Gohar**, Professor of General and plastic Surgery, Cairo University for his keen supervision and valuable instructions. Feeling a great honor of being his student.

I am so grateful and most appreciative to the efforts of ***Dr.*** **Mostafa Ahmed Abo El-Soud,** Professor of General and Plastic Surgery, Cairo University, who sacrificed a great deal of his valuable time in supervising and evaluating this work, for his sincere guidance, generous help, keen supervision throughout the work and his efforts bringing this work to existence. Not only he suggested the idea of this thesis but also supervised and worked hard to make it reaches its final form.

I would like to thank ***Dr.*** **Waleed El-Moez**, A. Professor of General and Plastic surgery, Cairo University, for his great kindness, help and cooperation till the completion of this work.

I wish to express my sincere gratitude and thanks to ***Dr. Ahmed Sherif Koriem,*** Professor of General and Plastic surgery, Cairo University, for his valuable guidance and expert advice.

My great thanks are to all the colleagues of the plastic surgical unite, Cairo University, for their kind support, cooperation and advice.

TO
MY PARENTS
&
MY WIFE

Table of contents

LIST OF FIGURES

List of abbreviations

AMH : Anti Mullerian Hormone.

GAP :Glans Approximation Procedure.

GRAP : Glanuloplasty Reconstruction And Preputiolasty.

HCG : Human Chorionic Gonadotrophin.

KGF :Keratinocyte Growth Factor.

LH :Leutinizing Hormone.

LHRH : Leutinizing Hormone Releasing Hormone.

MAGPI : Meatal Advancement and Glanuloplasty Incorporation.

MIP :Megameatus Intact Prepuce.

OIF :Onlay Island Flap.

TIP :Tubularized Incised Plate urethroplasty.

TPIF :Transverse Preputial Island Flap.

PDS :Polydioxanone.

Abstarct

Purpose: It is to evaluate the results of primary distal hypospadias repair to reach the optimal and best functional and normal appearance of the penis, with the maximum use of available tissues through implement of three types of repair for distal hypospadias namely; MAGPI, Mathieu and Snodgrass operations.

Material & Methods: From September 2004 to April 2007 the repair was performed in 60 patients 20 patient are allocated to underwent a Mathieu repair and 20 patients allocated to underwent a Snodgrass repair and 20 patients allocated to underwent MAGPI repair randomly. All groups are compared as regard functional (fistula formation and other complication) and cosmetic aspect. The patient age at the repair ranged from 12 months to 15 years.

Results: no cases developed fistula in MAGPI repair. In addition, two cases developed fistula that closed spontaneously in the Snodgrass repair while four cases developed fistula and all necessitated reoperative repair in the Mathieu repair. The Snodgrass repair was superior in the cosmetic results.

Conclusion: Tubularized incised plate urethroplasty takes less time and relatively of low incidence of complication and better cosmetic aspect than Mathieu and MAGPI repair

Key wards repair, Urethra, Hypospadias, Mathieu, Snodgrass, MAGPI.

INTRODUCTION

Introduction

Surgical correction of hypospadias remains one of the most challenging and rewarding problem faced by plastic surgeons and urologists. In the past, although functional improvement was the accepted goal of' reconstruction, current operations strive to attain functional and cosmetic normalcy ***(Micheal A. et al, 1999).***

Hypospadias is one of the most frequently encountered congenital malformations of the genitourinary system ***(Alan 13. et al, 2002).*** Its incidence is one in three hundred live male births ***(Hodgson, 1979).***

The current goals of hypospadias surgery are creating a straight penis, positioning of the meatus on the penile tip, normalization of erection and voiding, creating a urethra of adequate and uniform caliber, and symmetry in appearance of the glans and shaft ***(Alan 13. et al, 2002).***

The literature is repleted with many techniques such as:

- **MAGPI** (Meatoplasty and glanuloplasty) for glanular, coronal and subcoronal hypospadias without the need for a formal urethroplasty ***(Duckett J. J. W, 1981).***
- **Meatal Based Flap:** for anterior or distal hypospadias ***(Mathieu Procedure, 1932).***
- ***Glans Approximation and Modified Thierch Dnplay Repair 1989:*** *for glanular and Coronal hypospadias.*
- *Urethral plate Mobilization (Modified Barcat hypospadias*

Repair) for distal hypospadias ***(Barcat, J. 1973).***

- Onlay Island Flap for middle or distal shaft meatus with or without penile curvature ***(Duckett, 1992).***
- Tubularized Incised plate urethroplasty ***(Snodgrass, 1994).***

Even in the hands of the most experienced surgeons hypospadias repair is associated with a number of complications including abnormalities in the shape of the meatal opening, meatal stenosis, torsion penis, fistula, urethral stricture, urethral diverticula, meatal prolapse and persistent chordee ***(Alan,B, Anthony*** **A.** ***2002).***

A careful preoperative evaluation, precise surgical technique, and appropriate postoperative care are required to achieve the desired objectives of hypospadias surgery ***(Alan. B, Anthony*** **A** ***2002).***

Aim of work

It is to implement three types of repair for distal hypospadias namely; MAGPI, Mathieu and Snodgrass operations, and evaluating the results to reach the optimal and best functional and normal appearance of the penis, with the maximum use of available tissues.

Chapter 1

Embryology and anatomy of male genital development

Normal development of External Genitalia

The external genitalia develop between 'the 8th and 16th weeks of gestation. Differentiation is induced by dehydrotestosterone (DHT), the active androgen converted from testosterone by 5α-reductase. The genital swellings contain undifferentiated mesenchyme and differentiate under androgenic stimulation into the scrotum. The testes at this time are intra-abdominal and develop never more than 1.3 mm from the internal ring ***(Hutson, 1986).*** The testes lie dormant within the abdomen until about the 23rd week of gestation, during which time the processus vaginalis continues its elongation into the scrotum. The testis, epididymis, and gubernaculum have been observed to descend en mass through the inguinal canal posterior to the patent processus vaginalis. Transinguinal transit of the testes is a rapid process that probably occurs within a period of several days ***(Scorer 1964; Backhouse, 1982b; Heyns, 1987; Sampaio and Favorito, 1998). Heyns (1987)*** found that 75% of testes passed through the inguinal canal between 24 and 28 weeks of gestation and only 2.6% of testes were present within the inguinal canal during the period of descent. His postmortem dissections of spontaneously aborted human fetuses showed that testicular descent had occurred in 10% at 24 weeks' gestation, in 50% at 27 weeks, in 75% at 28 weeks, and in 80% at 34 weeks to birth. This coincides with a 72% descent rate reported in fetuses weighing less than 1200 g or having a crown-rump length greater than 270 mm ***(Heyns, 1987). Sampaio and Favorito (1998)*** observed, similarly, that before 23 weeks of gestation the majority of testes remained intra-abdominal,

yet by 30 weeks all testes were descended into the scrotum. Complete descent from the external ring to the bottom of the scrotum may take more than 3 to 4 weeks ***(Curling, 1843; Scorer and Farrington, 1971***).

Sampaio and Favorito (1998) reported that transinguinal migration occurred between 21 and 25 weeks after conception. In addition, testes remained undescended in fetuses weighing less than 990 g or having a crown-rump length of 245 mm or less, whereas all testes were descended in fetuses weighing more than 1220 g or having a crown-rump length greater than 275 mm. These data support epidemiologic findings in newborn boys with cryptorchidism and suggest that fetal and birth weights are a significant determinant of descent in males after 30 weeks' gestation ***(Schneck and Bellinger, 2002).***

The study of embryology provides a useful basis for the understanding of definitive human anatomy and various congenital disease processes. During the past two decades, a torrent of molecular information and novel experimental techniques has revolutionized the field of embryology. From the urologic surgeon's perspective, however, the classical, descriptive aspects of anatomic embryology continue to serve as an important reference point from which various congenital problems are solved. Figure 1 outlines the genital development ***(Park, 2002).***

The early development of the external genitalia is similar in both sexes. Early in the 5th week, a pair of swellings called *cloacal folds* develops on either side of the cloacal membrane. These folds meet just anterior to the cloacal membrane to form a midline swelling called the *genital tubercle* (figure 2).