Comparative Study Between Parameatal Lateral Based Flap Technique and Longitudinal Preputial Flap Technique for Distal Penile Hypospadias Repair

Thesis

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بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ

﴿وَعَلَّمَكَ مَا لَمْ تَكُنْ تَعْلَمُ وَكَانَ فَضْلُ اللَّهِ عَلَيْكَ عَظِيمًا﴾

صدق الله العظيم

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List of Contents

Title Page No.

List of Tables

List of Figures

List of Figures *cont...*

List of Figures *cont...*

Abstract

Our results in comparison to the two groups showed statistically insignificant differences between the two groups.

In comparison to other studies, our results are comparable to them as regard the cosmetic appearance satisfaction, rate of fistula formation, meatal stenosis and other complications.

On the basis of our study, we concluded that comparing the use of parameatal lateral based flap and the use of longitudinal preputial flap in distal hypospadias repair showed statistically insignificant difference between the two groups, but parameatal lateral based flap seemed to be useful in patients that are previously circumcised, also in patients that had small inadequate glans the parameatal lateral based flap seemed to be better than the longitudinal preputial flap where the preputial flap was difficult to be placed in a narrow glanular groove. Also longitudinal preputial flap seemed to be useful in uncircumcised patients who had hypoplastic urethral plate and hypoplastic ventral dartos where the parameatal lateral based flap would have less vascular pedicle.

Key words: Longitudinal Preputial Flap Technique - Parameatal Lateral Based Flap Technique - Pathogenesis - Lateral Based Flap

INTRODUCTION

The term hypospadias is derived from the Greek. *"Hypo"* means under and *"spadon"* means a rent or fissure ***(Konstantinos et al., 2012).***

Hypospadias is the most common congenital malformation of the penis. The prevalence of hypospadias has been estimated to range between one per 200 to 300 live male births; however, its prevalence may vary among different populations around the world ***(Baskin et al., 2001).***

Hypospadias is a triad of defects, an abnormal ventral opening of the urethral meatus which may be located anywhere from the ventral aspect of the glanspenis to the perineum, chordee and a dorsally hooded prepuce.

Hypospadias is classified according to the location of the urethral opening as glanular, coronal, subcoronal, distal penile, midshaft, proximal penile, penoscrotal, scrotal or perineal ***(Reynard et al., 2013).***

Many techniques and modifications for surgical correction of hypospadias are continually developed with hopes of minimizing complications and improving functional and cosmetic results ***(Steckler, 1997).***

However, Complications after hypospadias repairs are common, with fistula formation accounting for approximately

75%, some patients still develop glans dehiscence & meatal stenosis ***(Snyder et al., 2005).***

Regardless the technique employed for repair of hypospadias and its associated defects attention to urethroplasty, suturing technique, hemostasis, dressing and skin coverage are universal concern in the rate of repair success. Second layer coverage of the neourethra with the use of various vascularized flaps has significantly decreased urethrocutaneous fistula as a complication of hypospadias repair ***(Dhua et al., 2012).***

There are various types of vascularized flaps that can be used for distal penile hypospadias repair, of these are the lateral based flap and the longitudinal preputial flap.

The parameatal lateral based skin flap is characterized by a dual blood supply from the preputial vascular pedicle and the parameatal tissue, this helps to minimize the incidence of complications and increases the success rate. The results of the parameatal lateral based flap have been satisfactory from the cosmetic and functional point of view ***(Hadidi et al., 2004).***

The preputial skin, with its accompanying superficial fascia and vessels, is ideal material for the construction of flaps for hypospadias repair. It is relatively thin and pliable, and has a good blood supply that can be mobilized as a pedicle. This particular skin tolerates prolonged contact with urine ***(Hadidi et al., 2004).***

AIM OF THE WORK

The aim of this thesis is to compare between parameatal lateral based flap and longitudinal preputial flap techniques in distal penile hypospadias repair on the basis of functional and cosmetic outcome, and the incidence of complications.

Chapter One

EMBRYOLOGY AND ANATOMY

The glandular urethral formation:

Two theories have been proposed:

1. Primary intrusion of the ectodermal tissue from the skin of the glans penis
2. Endodermal cellular differentiation, wherein the glandular urethra formed by an extension of urogenital sinus epithelium undergoes transdifferentiation into stratified squamous epithelium ***(Yamada et al., 2003)*** (figure 1).

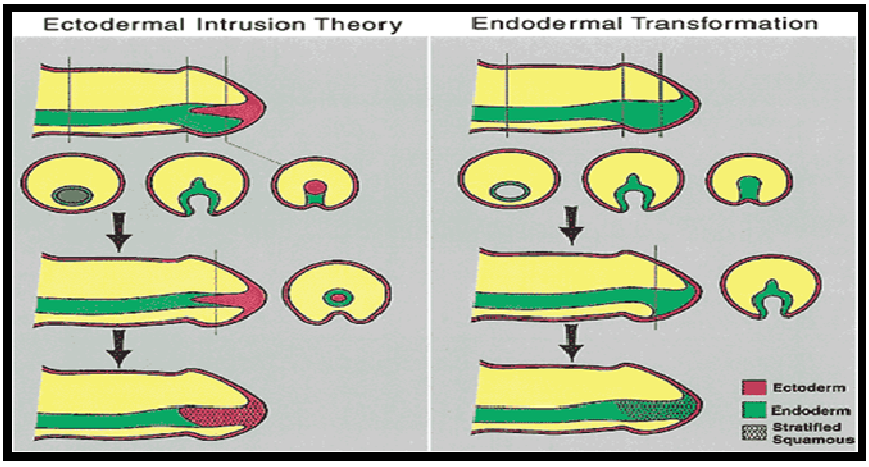

Figure (1): The mechanism of the glandular urethral formation ***(Wang and Baskin, 2008).***

Formation of the prepuce:

The formation of the future prepuce is dependent on normal urethral development. At about the 8th week of gestation, low preputial folds appear on both sides of the penile shaft, which join dorsally to form a flat ridge at the proximal edge of the corona, the ridge does not entirely encircle the glans because it is blocked on the ventrum by the incompletely developed glandular urethra ***(Wang and Baskin, 2008)***

Simultaneously, epithelium proliferates into the base of the fold to form what is called glanular lamella. The mesenchyme lying between the epithelium of the preputial fold and the glanular lamella becomes active in conjugation with lamellar epithelium. Thus the preputial fold is transported distally by active growth mesenchyme between the folds as well as the rapid proliferation of the ectoderm of the glanular lamella ***(MacLennan, 2012)*** (figure 2).

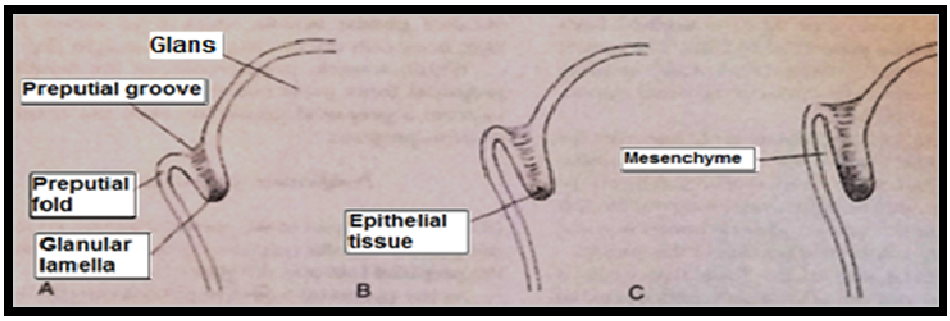

Figure (2): Formation of prepuce ***(MacLennan, 2012).***

The process contiue until the preputial fold cover all the glans except for the ventral portion which is blocked by the late closure of the urethral groove. However by the time of the fetus reach 12 weeks of age, the distal urethra has been formed and preputial fold not only cover the entire glans but because of continued mesenchymal proliferation, extend beyond it. If the genital folds fail to fuse, the preputial tissues do not form ventrally ***(MacLennan, 2012).***

Abnormal Development in Hypospadias

Abnormal morphogenesis in hypospadias affects three main anatomical features:

1) Ectopic Orifice

The primary anomaly of hypospadias is failure of the midline perineal mesenchyme to grow ventrally to cover the urethral plate as it canalises.

The opening of the urethra is commonly arrested at or near the coronal groove of the glans. This position is normal in 9- and lO-week human embryos ***(Clarnette et al., 1997)*** (figure 3).