

# **Recent Trends in Management of Proximal Hypospadias**

Essay

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General surgery

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## **List of abbreviations**

1 <sup>st</sup>	First
2 <sup>nd</sup>	Second
5 <sup>th</sup>	Fifth
7 <sup>th</sup>	Seventh
19 <sup>th</sup>	Nineteen
Ed	Editor
Fig.	Figure
Fr.	French
FSH	Follicular Stimulating Hormone
HCG	Human chorionic gonadotrophin
LH	Luteinizing Hormone
OIF	Onlay Island Flap
PDS	polydioxanone
SIS	Small Intestinal Submucosa
TIP	Tubularized Incised Plate
TPIF	Transverse preputial island flap
VCUG	Voiding cysto-urethrography

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# INTRODUCTION

Hypospadias is congenital abnormality occurring in 1 of 300 live birth and recent studies suggest an increase of the incidence with considerable variation in different countries (*Barbagli et al., 2006*).

Hypospadias is categorized by the position of the urethral opening which may be distal in 80% of cases (coronal, glandular, distal penile and midpenile) and proximal in 20% of cases (proximal penile, penoscrotal and perineal) (*Horton CE et al., 2004*).

Presentation and patient dissatisfaction may be wide ranging and may be related to urinary dysfunction, sexual dysfunction, and/or inadequate cosmetic appearance (*Manzoni G et al., 2000*).

Initial examination of these patients usually guides our decision of which salvage technique could be used. However, the final decision is usually made intraoperatively after taking into consideration the amount and location of scarring, the availability and quality of penile skin and the quality of the urethral plate. Meatus location and wound closure will further influence decision making (*Al-Sayyad et al., 2006*).

Modification of current techniques for the correction of proximal hypospadias as well as new innovative techniques continues to be proposed. Approximately 20% of meatal opening of hypospadiac patients are located proximally, anywhere from the penoscrotal to the perineal region. Repair of proximal defects is still one of the most challenging surgical procedures facing the surgeon (*Retik and Atala, 2000*).

The general principles of repair included minimal use of cautery, avoidance of tension on repair, use of well vascularized tissue, closure in as many layers as possible, single stage repair with epithelial inversion, use of loupe magnification but not the operating microscope, and identification and relief of any obstruction before fistula or diverticulum repair (*Snyder CL et al., 1993*).

Modern techniques make it possible to offer a single operation before the age of memory recall so that the child can grow to adulthood without feeling inferior in any way regarding his sexuality (*Kraft KH et al., 1993*).

Success was defined by having a functional urethra without fistula, stricture, or residual chordee and having a cosmetically acceptable glandular meatus after completion of all secondary procedures (*Barbagli et al., 1994*).

Complications after any surgical procedure are possible and these are higher in hypospadias compared to other reconstructive operations. The reported incidence of complications ranges from 6 to 30%, varying with the severity of the hypospadias (*Beuke et al., 1994*).

## **Aim of the work:**

The aim of this study is to illustrate the different technique in repairing proximal hypospadias that remains very challenging, with a significant rate of complications even in the best hands; and to high-light the different procedures done either stage-one repair procedure or multistage procedures, with the different options to improve the outcome.

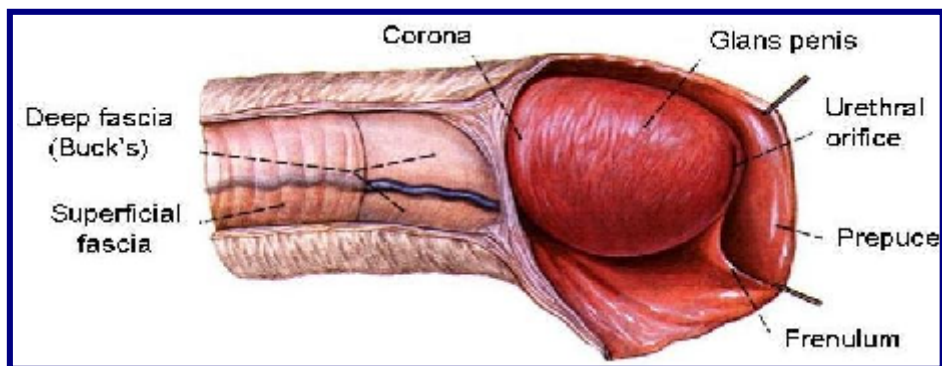
## Anatomy of the Penis And Male Urethra

The penis is the male copulatory organ and, by conveying the urethra, provides the common outlet for urine and semen. It consists of an attached root (radix) in the perineum and a free pendulous, body (corpus), which is completely enveloped in skin (*Moore and Dalley, 1991*).

### The Penis composed of:

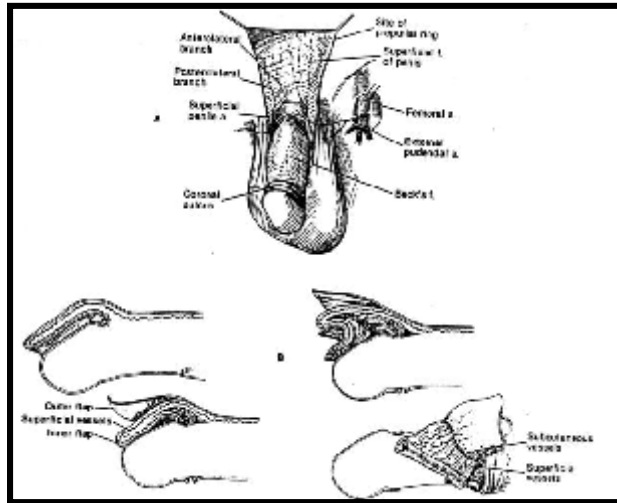
#### 1. Skin:

The penile skin is remarkably thin, dark and loosely connected to the tunica albuginea. At the corona of the penis it is folded to form the prepuce or foreskin, which variably overlaps the glans. The internal preputial layer is confluent at the neck with the thin skin covering and adhering firmly to the glans, and by this with the urethral mucosa at the external orifice. On the urethral (ventral) aspect of the glans a median fold, the frenulum, passes from the deep surface of the prepuce to the glans immediately proximal to the orifice (Fig. 1). The prepuce and glans penis enclose a potential cleft, the preputial sac, and two shallow fossae flank the frenulum (*Gray, 1973*).



(Fig. 1): Distal end of the penis showing the prepuce

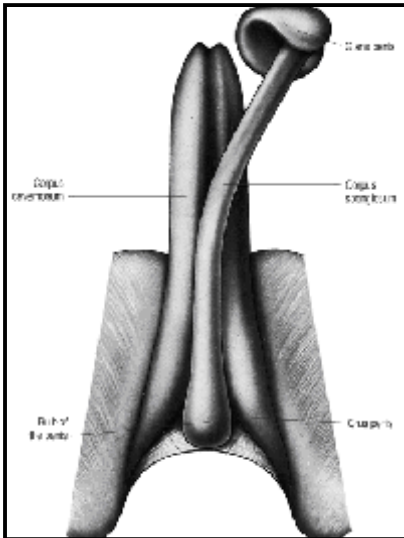
If the vessels within the Dartos fascia are carefully dissected, an island flap will remain viable. The island flap, typically based on the antero-lateral superficial vessels on one side, can be used in various techniques in hypospadias repair. Although the principal arterial support has been diverted away from the outer skin flap, sufficient circulation usually remains from the subcutaneous vessels foreskin coverage (Fig. ٢).



(Fig. ٢): Preputial blood supply

## ٢. The Root of the Penis:

The root of the penis consists of three masses of erectile tissue in the urogenital triangle, namely the two crura and the bulb, firmly attached to the pubic arch and perineal membrane respectively. The crura are the posterior regions of the corpora, and the bulb is the posterior end of the corpus spongiosum (Fig. ٣) (Gray, ١٩٩١).



(Fig. 3): Ventral aspect of the constituent erectile mass of the penis in erect position

Each penile crus starts behind as a blunt, elongate but rounded process, attached firmly to the everted edge of the ischiopubic ramus and covered by ischiocavernosus. Anteriorly it converges towards fellow and is slightly enlarged posterior to this. Near the inferior symphyseal border; the two crura come together and continue as the corporacavernosa of the body of the penis (Gray, 1973).

The bulb of the penis lies between the crura and is firmly connected to the inferior aspect of the perineal membrane, from which it receives a fibrous covering. Oval in section, the bulb narrows anteriorly into the corpus spongiosum, down and forwards at this point. Its convex superficial surface is covered by bulbospongiosus. Its flattened deep surface is pierced above its centre by the urethra, which traverses it to reach the corpus spongiosum (Gray, 1973).

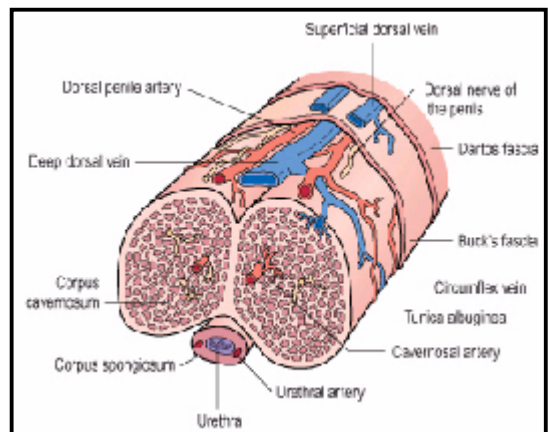
### 3. The body:

The body of the penis contains three elongated erectile masses; the erectile masses are the right and left corpora cavernosa and the median corpus spongiosum, which are continuation of the crura and bulb of the penis respectively (Healy et al., 1973).

### **Corpora cavernosa:**

The corpora cavernosa of the penis form the most of the body. They share common fibrous envelope and are separated by median fibrous septum (*Healy et al., 2000* ).

They are enclosed in a strong fibrous tunica albuginea, consisting of superficial and deep strata. The superficial fibers are longitudinal, and form a single tube around both corpora. The deep fibers are circularly oriented and surround each corpus separately, joining together as median septum of the penis. The median septum is thick and complete proximally so the corporal bodies can be separated proximally for 2-4cm. Distally it consists of a pectiniform (comb like) series of bands and is called the pectiniform septum which is complete and allows cross circulation of blood between the two corpora (Fig.4) (*Healy et al., 2000* ).



**(Fig. 4):** Transverse section of the penis