

# Clinical Outcome of Modified Thiersch Duplay Urethroplasty for Proximal Hypospadias

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## ABSTRACT

**Objectives:** To report the functional results, complications and cosmesis by using Thiersch Duplay urethroplasty repair for hypospadias.

**Patient and Methods:** Between years 2006 to 2007, 30 patients underwent repair of proximal hypospadias (penoscrotal) with chordee. Two stage repair was performed in all cases. 1<sup>st</sup> stage consisted of chordee correction by excising fibrous cord between ectopic meatus and corona along with incision of glans. The grafting of the dorsal hood skin was made on ventral aspect of tunica albuginea. In second stage repair U shaped incision was made around hypospadiac meatus and a ventral skin flap was dissected superficially to allow tubularization around a suitable size silicon Foley catheter (5 -8 Fr in children, 10-12 Fr adolescence and 14-16 Fr in adults) without tension. The Thiersch Duplay tube was constructed using 5/0 vicryl. A subcutaneous fascial layer was closed over tube to support neourthra. The Foley catheter was left for 10-12 days.

**Results:** Age range was 3-25 years with mean  $\pm$  SD of  $12.7 \pm 5.09$ . Total hospital stay was 10-12 days with mean  $\pm$  SD of  $11.9 \pm 0.85$ . Twenty five patients (80.2%) could void on standing and had a good caliber straight single stream of urine in forward direction. The cosmetic appearance of a natural vertical slit glanular meatus situated at the normal position on the glans achieved in twenty five patients. Period of follow up was 4-8 month mean with mean  $\pm$  SD of  $6 \pm 1.43$ . Main complications seen were urethrocutaneous fistulae in three (9.9%), meatal stenosis in three (9.9%), hematoma in one (3.3%), complete disruption in one (3.3%) infection in two (6.6%) and painful bladder spasm in two (6.6%). These seen in five (16.5%) patients.

**Conclusion:** Staged urethroplasty for proximal hypospadias results in a normal penis with good functional, minimum complications and excellent cosmesis, with short hospital stay.

**Key Words:** Hypospadias, Urethra, Thiersch Duplay, Urethroplasty.

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## INTRODUCTION

In hypospadias urethral meatus opens on the ventral side of the penis proximal to the tip of the glans. The incidence of hypospadias is 1 in 300 live male births [1]. In the United State, almost 6000 boys with hypospadias are born each year. The most common anomalies associated with hypospadias are undescended testis and inguinal hernia [2].

The first account of hypospadias surgery was written by Heliodoros and Antyllus (100-200 A.D) [3]. Thiersch (1869) described local tissue flap to repair epispadias a technique he later used in hypospadias. Duplay (1874) used Bouision's technique to release chordee and at later stage formed the central flap which was tubularized and then covered with penile flap. This technique was later popularized by Denis Brown [4]. Byars 1955 developed the two

stage method by extending the foreskin on to the glans in the first stage and rolling a complete tube in the second. Durham Smith (1990) refines the Byars approach by denuding the epithelium on skin edges to allow double breasting of raw surface. A complete review of procedure up to 1970 has been published by Horton and his associate [4].

More than 200 reconstructive procedures have been described for hypospadias repair. Despite large number of operative techniques for hypospadias repair, the complication rate is very high. The key to successful hypospadias surgery is minimal tissue handling, tension free reconstruction, the use of well-vascularized tissue, knowledge of repairs are indicated and preservation of urethral plate. Using these principles, excellent cosmetic and functional results

can be expected for treatment of hypospadias. All types of repair involve straightening the penis by removal of chordee. Most successful techniques for repair of hypospadias make use of local skin and foreskin in developing the neo-urethra [5]. In recent years, advancement of the urethra to the glans penis has become technically feasible and cosmetically acceptable [6].

### MATERIAL AND METHODS

Between the years 2006-2007, thirty patients underwent repair of proximal hypospadias with chordee. All had penoscrotal hypospadias along with chordee. Two staged repair was performed in all cases. First stage consisted of orthoplasty while second stage consisted of neo-urethra formation over a suitable silicon catheter.

**Surgical Technique First Stage:** A glans traction suture of 2/0 or 3/0 silk is fixed. A sub-coronal circumferential incision is made and the penis is degloved. The sleeve of skin is allowed to drop back with the urethra which is then dissected away from the fibrous bands which tether it to the corpora cavernosa. The chordee is corrected by excising the fibrous tissue. An artificial erection test is carried out. The glans is incised in the midline until it looks quite flattened. Continue the incision to the tip where the new meatus is to lie. The prepuce is divided in the dorsal midline to form two equal halves and then brought round to the ventral aspect of the penis and sutured to its counterpart to the under side of split glans to cover the raw area and the shaft of the penis using 5/0 vicryl. A Foley catheter is left indwelling for two days while a pressure dressing is applied for 24 hours to prevent haematoma.

**Second Stage:** The patients are readmitted for the second stage at least 12 weeks after the first stage. A U shaped incision is made around the hypospadiac meatus, including the ventral skin flap of adequate width. Both edges of the ventral skin flap are dissected sufficiently to allow tubularization around a suitable sized silicon Foley catheter without tension. The modified Thiersch Duplay tube is constructed using subcuticular 5/0 vicryl suture. A subcutaneous fascial

layer is closed over the tube to support the neo-urethra. By half circumferential incision, the skin from the dorsal surface is approximated on ventral midline. The Foley Catheter was left for 10- 12 days. In early post operative period wound was examined for hematoma, urinary leakage, and infection. During follow up, history of force and direction, of urinary stream was noted. Local examination for urethrocutaneous fistula, meatal size and patency of neo-urethra was assessed.



a. U-shaped incision around the hypospadiac orifice includes a ventral skin flap



b. Construction of Thiersch- Duplay neo-urethral tube



**c. A subcutaneous fascial layer cover to support neo-urethra**



**d. Closure of glans flap and penile skin ventrally**

## RESULTS

Age range of patients was 3-25 years, mean  $\pm$  SD (12.5  $\pm$  5.08). Total hospital stay was 10-12 days with mean  $\pm$  SD (11.9  $\pm$  0.85). Out of thirty patients twenty five (80.2%) could void on standing and had good caliber straight single stream of urine in forward direction. The cosmetic appearance of a natural vertical slit granular meatus situated at the normal position on the glans achieved in these patients. Period of follow up was 4-8 months with mean  $\pm$  SD (6  $\pm$  1.43). Main complications seen were urethrocutaneous fistulae in three (9.9%), meatal stenosis in three (9.9%), hematoma in one (3.3%) complete disruption in one (3.3%), infection in two (6.6%) and painful bladder spasm in two (6.6%). These complications were seen

in five (16.5%) patients i.e. some patients having more than one complications. Patients who developed urethrocutaneous fistulae also had meatal stenosis. A hematoma formed in one patient was evacuated surgically which later on ended in complete disruption after one week.

Frequent painful bladder spasms occurred in two (6.6%) patients who were relieved by antispasmodic drugs. The cosmetic and functional results were excellent in all patients; redo surgery was not required in any patient for the purpose of cosmesis.

## DISCUSSION

Surgical techniques for the repair of hypospadias are being developed continuously, implying that no single procedure is considered a panacea for hypospadias repair [7]. We have applied Thiersch Duplay procedure for repair of hypospadias and have found that outcome was satisfactory with some minor complications. In another study this procedure has been applied along with incision of urethral plate [8].

In a study by Samuel (2002) main complication was urethrocutaneous fistula in 6%. Another study incidence of fistulae was 4.8% [9]. In a study by Melih Sunay the incidence of fistulae was 23.4% [10]. The Holland et al demonstrated the incidence of fistulae as 7% [11]. In our study the incidence of fistulae was 9.9%, comparable with other studies. In our study during first stage, the dorsal skin was mobilized and brought onto the ventral side of phallus; this is helpful in reconstruction of adequate neo-urethra during second stage. Staged urethroplasty for proximal hypospadias results in a normal penis with good function, minimal complications and excellent cosmesis [12,3].

Chen reported meatal stenosis in 4 (12%) patients [14]. Snodgrass et al reported it in two of their patients (1.35%) [15]. In comparison to this we have noted meatal stenosis in two patients (6.67%). The cause of significant meatal stenosis after surgery is probably the adherence of both raw side of the incised plate during healing. Jordan and Schlossberg explained in detail the healing process of urethral wound [16]. If the epithelia are opposed, wound healing occurs by primary intention resulting in stenosis. When epithelial opposition is prevented by separating both edges of the wound, healing occurs by secondary intention and the epithelium progresses slowly from the edges of the wound to cover the raw area. The most reliable method

to counteract the process of urethral wound contraction is long term and regular dilatation of the urethra is needed [17]. Subcuticular suturing of the neo-urethra and closure of the glans using vertical mattress sutures which evert the epithelial edges of the glans is an alternate maneuver to prevent fistula formation. We have applied this technique in all patients with good results.

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