Evaluation of the Result of Whole Penile Foreskin Transposition in Hypospadias Repair

Mahdi H. Abood

ABSTRACT:

BACKGROUND:

There are many technique of foreskin transposition, which may be employed in conjunction with any of the technique for reconstruction of neourethra.

OBJECTIVE:

The aim is to evaluate the result of the whole penile foreskin transfer to resurface the shaft after reconstruction of neourethra by a modified Mustarde technique.

METHODS:

Sixty hypospadias patients, thirty one with distal penile type and the other twenty-nine were midshaft penile type, treated by Glenn Shepard modification of Mustarde technique to reconstruct neourethra, the whole foreskin transport and wrapped around the shaft.

RESULTS:

The minimal fallow up was 8 months. The functional and the cosmetic result were satisfactory for most of the patients with three exceptions which represent 5% of the cases who ended in complete failure and other complications were minor.

CONCLUSION:

The whole foreskin flap wrapped around the shaft to resurface the whole shaft including the neourethra may minimize the risk of fistula formation. Securing the neourethra to the corpora by several interrupted absorbable suture provide adhesion of the tube to bed and may give better chance of healing and prevent twisting of the tube, firm and uniform dressing is essential.

KEY WORD: Whole foreskin transposition in hypospadias

INTRODUCTION:

Hypospadias is a common congenital anomaly that causes great concern to both the patient and parents who profess in security about the sexual potential of their child [1]. The modern technique of hypospadias repair began over a century ago and since then hundreds of distinct repair and modification have been described [2,3], most modern procedure is merely modification of older operation [2, 4].

This technique can be classified as either multi staged or one stage procedure and these can be divided into those using only penile skin, those using penile and scrotal skin and those using free graft in the repair. Mustarde published his operative technique in 1965 which is based on combination of earlier technique notably that of Bevan 1917-It is one stage procedure using rectangular flap from the ventral surface of the penis to reconstruct neourethra[5].Beside the desirability of completing the reconstruction in one operation, a single stage procedure has the additional advantage of using skin that is unscarred from previous surgical procedures [6].

Department of Plastic and Reconstructive Surgery, Alwasity hospital for Reconstructive Surgery, Baghdad / Iraq.

Glenn.H.Shepard, William H Sipe and William J.Dierbarg published modification of a Mustard's technique by adding v-shaped flap to facilitate the proximal urethral repair [7].

V-shaped glanular flap technique, which was published, by Horton and Devin minimize the meatal stenosis. There are many techniques of foreskin transposition, which may be employed in conjunction with any of the technique for creation of neourethra [3].Urinary diversion is required for all the cases but the most distal repair [3].

In these series we represent the evaluation of the result of modified Mustarde technique which had been published by Glenn. H.Shepard and Co-worker for reconstruction of neoureth with the use of the whole penile foreskin to resurface the shaft.

Surgical technique: Meatatomy as preliminary step is done 6-12 month prior to urethroplasty.

Urethroplasty: General anesthesia is given in all the patients. Traction suture is inserted into the glans on the dorsal side of the tip to ovoid interfering with the construction of opening on the glans. V Shaped flap just distal to the urethral meatus should be added to rectangular flap mentioned by Mustarde is drawn on the ventral surface of the penis to include the

opening of the urethra extended proximally along the shaft of the penis far enough to allow this flap to connect the opining of the urethra in the tip of the glans after the chordee has been completely excised as in figure (2).
The flap is 18 mm. on width so that it can be tubed to form a neourethra of adequate dimension. A tourniquet around the base of the penis is applied to provide a bloodless field as in figure (3), magnification loup were used to aid meticulous repair, and to facilitate the flap elevation nasogastric tube is inserted into urethra. The flap is completely undermined except for a strip comprising the distal one-quarter, which is left attached around the urethra. The area between the distal edge of the flap including the v-shaped flap and the glans and the area lateral and beneath the v-shaped flap is carefully dissected and all fibrous tissue is removed so that the chordee is completely released. A tunnel can be created in the glans with excision of a core of glans tissue from the tunnel provide a tunnel of adequate size for distal neourethra. Lubricated nasogastric tube of proper size inserted from the tip of the glans through the tunnel carefully and gently and then inserted into the urinary bladder. Neourethra is obtained by tubularization of the flap around the nasogastric tube leaving open the 4-5mm segment that unites with the distal v. flap of the glans. Closure is performed by 6/0 absorbable sutures subcuticularly to build the neourethra. The skin of the shaft of the penis lateral in the nap is now widely undermined after an incision is carried out around the corona so that the prepuce can be lifted keeping about 8 mm of the inner part of the prepuce attached to the glans just like circumcision figure (6), the tourniquet is released and major bleeder coagulate by bipolar cauterization. The neourethra created by tubularization of the flap around the nasogastric tube are threaded through the tunnel of the glans. The longitudinal suture line of the neourethra lies deep against the groove between the corpora covernosa, and the tube (neourethra) is secured to the corpora covernosa along its length with several interrupted 6-0 absorbable sutures sewn to the tunica albuginea of the corpora figure (4). The distal v flap of the glans will accommodate the v-shaped defect of the tube already left open and sutured in place by 6-0 absorbable suture and the terminal end of the urethral tube is very carefully married up to the wound in the glans. Subcutaneous tissue should be drawn across the neo-urethra when ever possible to provide additional buttress figure (5). The nasogastric tube is secured to the glans with two interrupted 4/0 silk sutures round needle is used figure (7). The foreskin of the penis can then be shifted and the dorsal skin wrapped to cover the ventral surface of the penis including the neourethra as well as the lateral and dorsal aspect of the penis and sutured by 6-0 absorbable suture in layers. The repair should not be so snug that urine can't flow around the tube. Corrugated drain is used and threaded through the suture line at the base the penis and kept for 24-48 hours figure (7). Non adherent first layer dressing is placed over the suture line, multiple layers of gauze are applied parallel the shaft and adhesive tape outer layer dressing is used to hold pressure on the repair firm and uniform dressing is essential. The nasogastric tube is fixed to the dressing provided that it will not create pressure on the ventral surface and an acute angulation of the tube is avoided, the glans is kept open for monitoring of the vascularity figure (8).

PATIENTS AND METHODS:

This surgical procedure has been used in 60 patients with hypospadias between 1997and2006.The ages ranges was from 2.5 year to 22 years, table 1. All patients were followed up for a minimum of 8 months, 55 patients were hospitalized for 10 - 14 days, while the other 5 left the hospital after three days. Broad-spectrum antibiotic were used. Topical antibiotic ointment is applied to the glans and meatus. The dressing is removed after 10-14 days then the penis is wrapped in a mildly compressive dressing and the nasogastric tube pulled genteelly from the urinary bladder and kept as a stent in the urethra then it is fixed to the glans and the excess is cut figure (9) the dressing is kept for 7 days, and the stent is kept for further 4-6 weeks, after removal of the stent, frequent dilatation of the neourethra using lubricated tip of the thermometer or ophthalmic tipped tube for 3-4 months.

RESULTS:

The total number of patients included in the study was (60), distal penile type were (41), and (19) mid shaft, patients with ages ranging (2.5-22) years mean 5.8 years as shown in table (1), all the patients were suffering from chordee preoperatively, the time needed to complete the surgical procedure ranging (60-90) minutes mean (70) minutes, the final outcome of the surgical procedure after a

period of follow up were satisfactory for most of the patients regarding the shape and the function figure (10), except three patients which represent 5% who had complete dehiscence of the wound and complete failure of the procedure one of them was 18 years and the other two were 22 years old, Four patients which represent 6.6% developed urethro-cutanous fistulae, the site of fistulae at the coronal sulcus where the suture line crosses.

Two of these fistulae were pinpoint and closed spontaneously, the others were closed surgically, and stenosis of the proximal anastomosis in one patient which represent 1.7% was treated by dilatation and reinsertion of a stent for 2 months. Meatal stenosis in two patients which represent 3.3% was treated by frequent dilatation using lubricated tip of the thermometer, so the total number of minor complications was (7) which represent about (11.7%) of the cases and the whole numbers of the patients who got complications were (10) and represent (16.7%) of the patients as shown in table(3).

Table (1) Age distribution in years

Age in years	Number of patients	%
2.5-4	22	36.7 %
5-6	26	43.3 %
7-10	7	11.7 %
18-22	5	08.3 %

Table (2) Type of hypospadias

Type of hypospadias	Number of patients	%
Distal penile	(41)	68.3 %
Mid-shaft	(19)	31.7 %

Table (3) complications of surgery

Type of complication	Number of the patients	%
Urethro-cutanous fistulae	(4)	6.7 %
Meatal stenosis	(2)	3.3 %
Stenosis of proximal anastomosis	(1)	1.7 %
Wound dehiscence and complete failure	(3)	5.0 %
Total number of the complications	(10)	16.7 %

Figure (1) mid-shaft penile hypospadias.

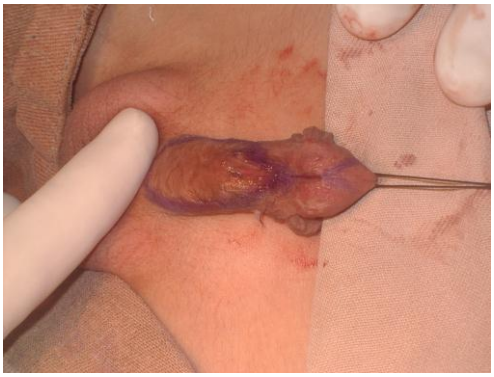

Figure (2) marking of Modified Mustarde showing adding V shaped flap to the rectangular flap.

Figure (3) tourniquet around the base of the penis.

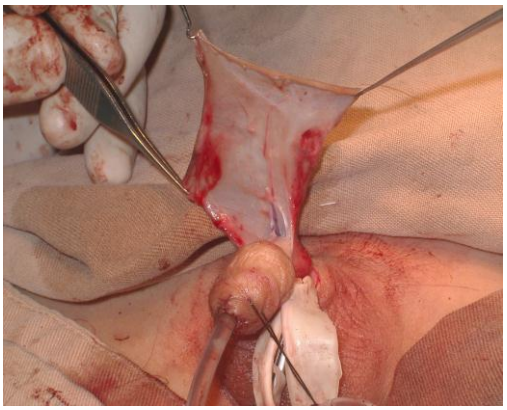

Figure (6) Whole foreskin flap elevated, Dorsal vein is noted

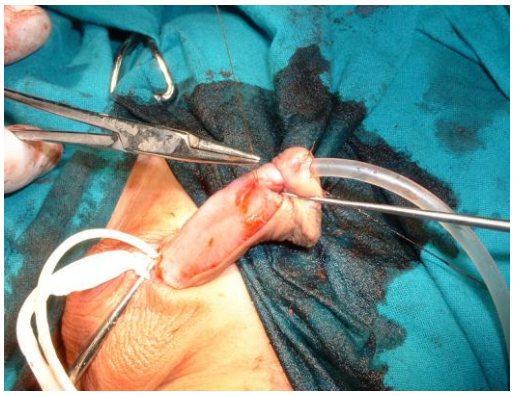

Figure (4) anchoring sutures Of neo-urethra to corpus spongeousum.

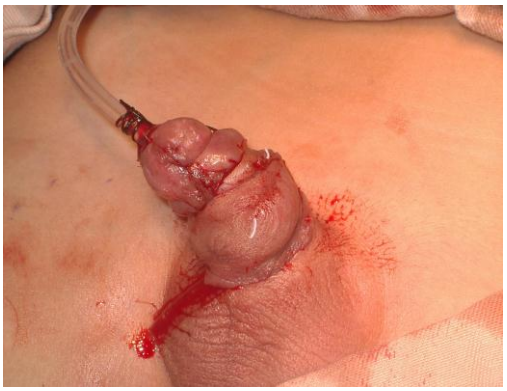

Figure (7) immediate post-operative view Showing corrugated drain, nasogastric tube

Figure (5) subcutaneous tissue drawn Around neo-utethr

Figure (8) dressing.

Figure (9) nasogastric tube as stent

Figure (10) show the patient voiding urine,

DISCUSSION:

At the present time no magic solution has been found for the problem of hypospadias,(5) now a day all existing technique are successful in cosmetic appearance postoperatively(8).

Meatal strictures, stricture at the site of the anastomosis of neourethra and urethra and urethro-cutanous fistula are common postoperative complications. A scar contract from end to end, if a scar is connected to form a circle and when the circle contracts meatal stenosis is likely to result following urethroplasty unless the circular scar is interrupted by interposing a flap as described by many surgeon whether the flap is v or w shaped (9). Charles Horton emphasizes that an adequate and abundant opening through the glans is essential to prevent meatal stenosis. Excising a core of glans tissue from the tunnel can minimize the chance of meatal stenosis (11). The channel should be wide enough to accommodate the neourethra and permits the normal healing contraction without narrowing the channel (8). R. O. Broiler adds "the key to prevent stenosis is to create a tunnel of adequate size so the reconstructed urethra is not constricted. Circular anastomosis on glans always contract, (10) use of a v-shaped flap of glans to suture the tube pedicle flap distally has reduced the incidence of meatal stricture after hypospadias repair. In this series the v-shaped flap used as described by Horton and Devine, this technique reduced the occurrence of meatal stenosis after hypospadias repair, excising a core of glans tissue after creating a tunnel through the glans to avoid adding other longitudinal suture line to avoid aesthetic alteration caused by the triple glans flap described by Horton and Devine and to minimize the chance of meatal stenosis.

The original urethral meatus should be patulous prior to the reconstruction of neourethra. In 1965 Mustarde published his method for Urethroplasty it is one stage procedure using rectangular flap from ventral surface of the penile skin to include the meatus the width of the flap should be at least 14 mm. Glenn H. Shepard, William Sipe and William J. Die berg published their surgical procedure, which is a modification of Mustarde procedure for Urethroplasty by using a second v-shaped flap to facilitate the proximal urethral repair. This technique reduced the risk of stenosis at the site of the anastomosis between the urethra and the neourethra as this allows non-circular proximal anastomosis, it is about (1.7%) in this series. The procedure used is similar to that reported by Glenn H. Shepard and et al. with important variation. First the width of the flap should be not less than 18 mm, which is the least appropriate dimension for skin to be tubed over appropriate size nasogastric tube.

The Second is by using proper size nasogastric tube, which is used here as stent and threaded into urinary bladder to provide urinary drainage, the tube is used as stent for the neourethra for 4-6 weeks and stenting may decrease the chance of stenosis while Hinderer Ulrich T advocated using small urethral tube(12). Foley catheter is not used here to avoid its complications; perineal cystostomy carries high risk of epididymitis. The third is that Mustarde used his technique for the reconstruction of distal penile and coronal type; here it is used for reconstruction of urethra in mid-shaft hypospadias as in figure (1) in addition to distal penile, and for coronal type we prefer urethral advancement technique. There are many techniques of foreskin transposition; In this series most of the foreskin was used except about few mm of the inner parts of the rolled foreskin which is left attached to the glans just like that of

circumcision, the flaps is wrapped around the shaft to resurface the whole shaft including the neourethra and so that suture line crosses at the coronal sulcus and this will minimize the chance of urethra-cutaneous fistula formation which had been noticed in four of sixty patients two of them were pinpoint, erection was the main cause of complete dehiscence of the wound in three patients above 18 years old, in Byer technique one flap tend to include the vein with good venous drainage and the other flap is often congested with risk of gradual arterial insufficiency and necrosis and the suture lines may cross the neourethra in two or three places which probably lead to a urethral fistula formation, while in Nespit technique, which is a modification of Ombredanne technique, a buttonhole is made at the base of the unrolled foreskin and the glans, is drowning through this, the immediate cosmetic result is not as good as with other method for skin transposition.

Securing the neourethra to the corpora by several interrupted absorbable suture provide adhesion of the tube to bed and may give better chance of healing and prevent twisting of the tube and so minimize the risk of fistula formation. Firm and uniform dressing is essential.

CONCLUSION AND RECOMMENDATION:

One stage procedure is preferable. Meticulous repair by the use of microscope or loupe is necessary with hypospadias repair.

The original urethral meatus should be patulous prior to the reconstruction of the neourethra.Tunnel of the glans should be of adequate size and enough to accommodate the neourethra.The neourethra should be adequate in width and should not be stretched. Securing the neourethra to the corpora covernosa minimize the chance of fistula formation. The repair should not be so snug that urine cannot flow around the tubing. Postoperative dilatation of the meatus by using nozzle of a tube of ophthalmic ointment tipped or using tip of thermometer is essential to decrease the chance of meatal stenosis.

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