CONTRIBUTION OF SNODGRASS REPAIR IN HYPOSPADIAS SURGERY

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ABSTRACT

Study Design: Descriptive Case Series

Place and Duration: Plastic surgery clinic, Aman hospital Dabgari Garden Peshawar from Dec.2012 to Dec. 2015.

Material and Methods: Patients with distal and mid penile primary hypospadias with no or minimal chordee and with adequate uretheral plate were included. Patients were examined pre operatively in supine position for meatus location, chordee, circumcision status and uretheral plate width and documented photographically. Patients were operated by the same senior Plastic surgeon. Postoperatively, same parameters along with glans configuration, urethro cutaneous fistula, urinary stream and meatal stenosis were observed along with patient's parent satisfaction.

Results: A total of 40 patients were included in this study. Mean age at surgery was 28 months with range from 24 to 72 months. Vertical slit like meatus was achieved in 35 (87.5%) patients, round in 2 (5%) and a conical glans in 38(95%) patients. Meatal stenosis was noticed in 3(7.5%) while urethrocutaneous fistula in 3(7.5%) patients. The final cosmetic result was considered good or satisfactory in 38(95%) cases.

Conclusion: This technique proves itself to be more promising tool in the armamentarium of Plastic and Paediatric surgeons especially for distal and mid penile hypospadias with minimal chordee keeping in view obviously the adequate uretheral plate width. However, further randomized controlled trials are needed to confirm its contribution especially for proximal hypospadias and with severe chordee of more than 30 degrees.

Key words: Hypospadias, Snodgrass repair, chordee, uretheral plate, slit like meatus

INTRODUCTION

Hypospadias is the most common congenital anomaly with a reported incidence of 1:200 male born patients[1]. There is ventral deficiency of tissue resulting into malposition of the meatus on the ventral aspect of the penis at different levels. Hypospadias is generally categorized as perineal, penoscrotal, proximal penile, mid penile, distal, sub coronal, coronal and glandular hypospadias[2,3].

Because of the complexity of its presentation and the nature of disease itself, more than three hundred procedures have been described in the literature till date, with no single procedure claiming itself to be the sole solution to this problem. An ideal procedure, of course, is the one which addresses the functional and cosmetic importance of this important part of human body. Function such as straight urinary stream without spraying from a slit like meatus located at the glans level and straight errection is ultimate goal. Likewise, a conical shape glans with no obvious scarring is preferred[4,5].

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Because of recent advances in Plastic and Paediatric surgical techniques, two procedures are widely recommended to deal any sort of hypospadias, both primary and secondary cases irrespective of the location of meatus. Snodgrass in 1994 introduced his technique i.e. tubalarised incised uretheral plate-TIP, taking advantage of the tissue already present which he referred to as uretheral plate[6]. This repair was initially restricted to the more distal primary hypospadias cases but later on gained popularity in addressing the mid penile and proximal hypospadias without or minimal chordee[7,8].

Aivor Bracka further refined the solution to the problem introducing his two stage technique for primary hypospadias with significant chordee irrespective of meatus location as well as for secondary or crippled cases. In the first stage, chordee is released and grafted with either preputial skin or buccal mucosa and then proper urethroplasty in second stage 6 months apart[9,10]. Aivor Bracka also introduced a variant of Snodgrass repair in which he actually grafted the dorsal incision and he called it as Snodgraft technique.

As the majority of hypospadias patients present with distal or mid penile variant comprising of about 70-75% of patients[11], Snodgrass (TIP) repair can easily be selected as the procedure of choice provided there is no or minimal chordee. In this article, we present our experience in this versatile technique in terms of

both functional and cosmetic aspects such as glans configuration, meatus location, urinary stream, erection, urethrocutaneous fistula, meatal stenosis, penile curvature and uretheral stenosis.

MATERIALS AND METHODS

This study was carried out at Plastic Surgery clinic, Aman Hospital Dabgari Gardens Peshawar from Dec. 2012 to Dec. 2015. After explaining the study protocol informed consent was acquired from all patients.

Inclusion criteria

Patients presenting with distal penile or mid penile primary hypospadias with no or minimal chordee and with adequate uretheral plate (6-8mm) were included.

Exclusion Criteria

Patients with significant chordee (more than 30 degrees) irrespective of meatus location were excluded.

A total of 40 patients were included in this study. Patients were examined in supine position and meatus location, chordee, circumcision status, urethral plate length and width and penis size were noted.

After surgery, Patients were followed for a period of two years. All the patients were examined for meatus location and shape, glans configuration, urethrocutaneous fistula, residual chordee, urinary stream and meatal stenosis through a standardized questionnaire. The appearance of penis documented photographically and parents were asked to assess the final cosmetic outcome result as good, satisfactory or poor.

SURGICAL TECHNIQUE

After proper scrubbing and draping, penile block with inj bupivicaine was done. Tourniquet was used to make the field bloodless. 8 Fr Silicone catheter was passed and a stay suture at corona with 4/0 prolene to help maneuver the penis, was performed followed by skin marking. A U shaped incision was made starting from just distal to the proposed new meatus and continuing it towards the glans on both sides. At this point, an incision is made in the midline of uretheral plate, starting from the meatus and running just short of the future meatus location to avoid stenosis.

After proper dissection to the corpora on both sides, a stay suture with 6/0 vicryl is made at the new meatus level i.e distal part of U shaped incision line, guiding us to the most distal location of uretheroplasty. Tubularization was started with 6/0 vicryl in continuous fashion and last suture bite tied to the already taken stay suture[12].

In order to confirm, saline was injected through the new meatus to see for any leak which was augmented by taking additional sutures. Waterproofing was performed by dissecting the buck's fascia and bringing it over the tubularised urethera. Glansplasty was then performed by dissecting the wings and bringing them over the new urethera in the midline.

At this point, the tourniquet was removed and hemostasis secured. Skin closure was done with 6/0 vicryl rapide. Mepitil dressing (silicone) was used to cover the repair site and catheter left for a week.

RESULTS

TIP urethroplasty was performed in 40 patients. The median age at surgery was 28 months with a range of 24 to 72 months. The preoperative location of meatus was coronal in 8(20%) patients, sub coronal in 12(30%), distal penile in 14(35%) and 6(15%) patients with mid penile meatus.

4(10%) patients presented with mild chordee which was corrected via penile degloving and dissection of urethra from the corpora. A vertical slit like meatus was achieved in 35(87.5%) patients, rounded in 2(5%), with a conical glans in 38(95%) patients. Meatal stenosis was noticed in 3 (7.5%) patients who were managed later on with meatotomy successfully. The urinary stream sprayed in 2 patients. We observed

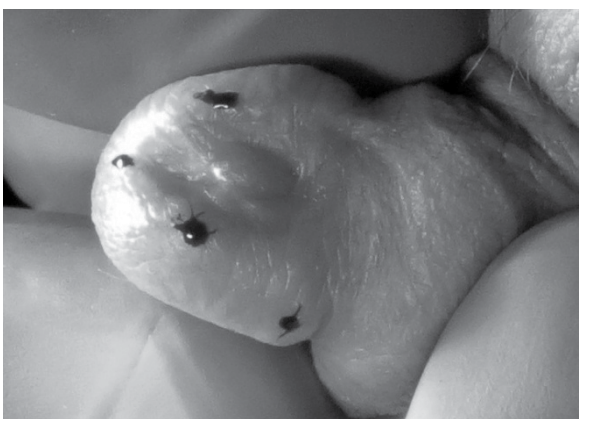

Fig. 1 Marking On glans

Fig.2 Urethroplasty completed

Fig.3 Post circumcision and skin closure

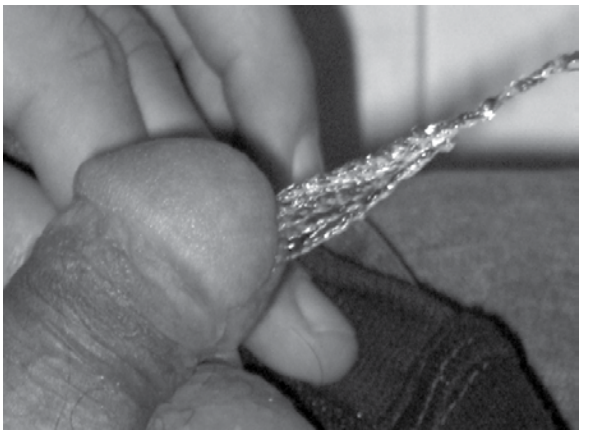

Fig.4. Urinary stream from slit like meatus

Fig 1: Distribution of different parameters among patients

Factor assessed	Parameters	N(40)	%
Meatus location	Coronal	8	20
	Subcoronal	12	30
	Distal penile	14	35
	Mid penile	6	15
Glanular configuration	Conical	38	95
	Intermediate	2	5
Meatus orientation	Slit	35	87.5
	Round	2	5
	Stenosed	3	7.5
Urinary stream	Straight	38	95
	Angled	0	0
	spray	2	5
Erection	Straight	39	97.5
	Ventral angulation	1	2.5
Uretherocutaneous fistula	No	37	92.5
	Yes	3	7.5
Cosmetic result	Good	30	75
	Satisfactory	8	20
	Poor	2	5

Urethrocutaneous fistula in 3(7.5%) patients, out of which 1 closed spontaneously and two required repair 6 months postoperatively. Residual chordee was noticed in 1 patient.

The final cosmetic result was considered good or satisfactory in 38(95%) patients.

DISCUSSION

Hypospadias is the most common congenital anomaly with an incidence of 1 in 200 male born patients. The exact cause is not known with multiple postulations both hormonal and exogenous risk factors[13].

Numerous techniques have been evolved over time to deal with the problem with no single technique being mentioned as the ideal one, ranging from initial flap techniques to nowadays graft or staged repairs. As distal hypospadias accounts for the majority of hypospadias patients i.e. 70-75%, a repair with consistent good cosmetic and functional result will obviously put significant impact on the outcome[14].

The mean age of surgery was 28 months which infers that these patients were referred late for their surgery, though we also tend to defer surgery till 2 years of age so that penis becomes of adequate size. This perception is in contrast to the opinion of operating as early as 6 months due to penile growth spurt in the first six months of life and because of the fear of development of castration complex at approximately 2-3 years of age[15,16].

Chordee is the abnormal ventral curvature of the penis, an entity that was poorly understood initially, but recent publication of Snodgrass clarifies it in detail and renamed it as ventral curvature(VC). VC is because of shortened ventral tissues including shaft skin, dartos, corpus spongiosum/uretheral plate and corpus cavernosa. We observed mild chordee (less than 30 degrees) in our 4 patients which was addressed with degloving and dissection of urethera from the corpora. This finding is consistent with many others though chordee tends to become more severe in patients with proximal hypospadias which then needs dorsal plications along with ventral corporotomies with or without dermal graft[17].

In this study, a good or satisfactory cosmetic outcome was observed in nearly all cases with a vertically oriented meatus which allows patients straight urinary stream without spraying or angulation. Though there is general consensus about the orientation of the meatus, its exact location is still debated[18,19].

We observed fistula in our 3(7.5%) patients which is well in comparison to the study carried out by Holland AJA et al and Uzair et al who also noticed 10% and 9.6%fistula rate consecutively[20].

Though this fistula rate is a bit high in comparison to the original work done by Snodgrass who in his 1994 study noticed 2.6% fistula rate. This might be due to high learning curve needed to master this technique.

In this present study, we observed meatal stenosis in our 3 (7.5%) patients which actually occurred in the same three patients who presented with urethrocutaneous fistula because of the increase back pressure. This rate is comparatively higher than the Snodgrass who observed no stenosis at all in his patients[21]. This might be due to the fact that we used to carry the incision on the glans close to future meatus in an attempt to place the neomeatus more proximal on the glans. Though we were more careful not to take the dorsal uretheral plate incision to meatus level which increases the risk of meatal stenosis but there is also controversy in the placement of this incision.

Our mean follow up was 24 months. Although it is sufficient enough to document the fistula, meatal stenosis, meatus shape and glans configuration but long term follow up to the adulthood is actually needed to document the erectile and ejaculatory status of these patients particularly those having severe ventral curvature of more than 30 degress.

We noticed good cosmetic outcome in our 95% of patients with conical glans configuration and a slit like meatus. It's due to the beauty of the technique itself which renders such outcome once proper execution of the technique is adopted although with a bit high learning curve. However, as our study only included distal and mid penile hypospadias patients who had minimal chordee, patients with proximal hypospadias and those with severe chordee need to be evaluated in regard to the final cosmetic outcome with this technique and also with the Aivor Bracka staged repair.

CONCLUSION

Although the single stage aspect of Snodgrass repair is an allure for most surgeons to opt for this repair technique but other most important factors like meatus location, chordee, uretheral plate width and prior surgical procedures must be taken into the consideration and once this repair technique is executed based on these parameters, it can obviously produce great results. However as the spectrum of this congenital anomaly encompasses major variations, great care and expertise should be exercised to choose among the different procedures. Further randomized controlled trials must be carried out to strengthen the contribution of this repair technique particularly in mid hypospadias and distal ones with curvature more than 30 degrees.

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