Mekonnen Hagos. *Ethiop Med J, 2017,Vol.55, No. 2*

ORIGINAL ARTICLE

HYPOSPADIAS REPAIR: REVIEW OF TECHNIQUES AND TREATMENT OUTCOMES IN MEKELLE –HOSPITAL, ETHIOPIA.

Mekonnen Hagos, MD[1*]

ABSTRACT

Introduction*: In hypospadias repair in the past 15 years, there has been a trend favoring procedures that incorporate the urethral plate into the neourethra. The study was conducted to review and report our experience on tubularized incised plate hypospadias repair, which is a versatile operation with potential applicability to wide spectrum hypospadias conditions.*

Methods: *From Sept. 1/2012 to August 30/2015, a retrospective review of all patients with hypospadias was done to assess the technique for repair and evaluate the treatment outcomes. Descriptive analysis was carried out using numbers, percentages and tables.*

Results: *There were 67 patients who underwent repair of hypospadias, all in Mekelle hospital. The age ranged from 8 months to 32 years of life. Most 42 (62.7%) patients had distal hypospadias. TIP (tubularized incised plate) repair technique was carried out in most 58 (86.6%) of the cases, Mathieu procedure in 7 (10.4%) and MAGPI repair in 2 (3.0%) of our cases. The overall morbidity encountered was in 9 (13.3%) but in only 7 (12.1%) of the cases with TIP hypospadias repair technique, mainly due to urethrocutaneous fistula, partial/complete neourethral dehiscence and neourethral stricture.*

Conclusion: *Patient satisfaction rate that exceeded 87.9% was achieved in this study ensuring that TIP repair technique is the best treatment option for wide spectrum of hypospadias conditions.*

Key word: *Hypospadias, Technique, Outcomes, Mekelle*

INTRODUCTION

Hypospadias is a common congenital anomaly in which the anterior urethra is incompletely developed and does not extend to the tip of the glans penis (1-3). The abnormal urethra meatus may be located anywhere along the shaft to the perineum. The corpus spongiosum may be deficient or completely absent from the distal urethra. It occurs in 3.2 of 1000 live male births and can vary in severity from the glanular to the perineal position. Fortunately the most distal varieties are both the most common and the simplest to correct (1-3). The anatomic findings vary in severity and are worst in cases in which the meatus is more proximally located. The hypospadias patients have an incomplete foreskin, called a dorsal hood because the foreskin is absent on the ventral surface of the penis. Frequently, the penis has ventral curvature called chordae due to fibrous tissue replacing the Buck's fascia which may vary in severity and location (1-4).

Surgical reconstruction is the only means of correction. Many surgical techniques have been described reflecting the need for versatility during reconstruction and the ultimate goal of repair is to create a cosmetically appealing penis with terminally situated conical meatus and to insure a well-directed straight and attain full urinary stream in the standing position (4-10). This review study will examine common surgical approaches applicable to patients with hypospadias including treatment out comes and complications encountered.

PATIENTS AND METHODS

From Sept. 1/2012 to August 30/2015, a review analysis of all cases with hypospasias admitted in Mekelle hospital was undertaken to assess the technique for repair and treatment outcomes. The source and the study group were (N-67). Adequate medical records

[1]Department of Surgery, Mekelle University
*Corresponding author : e-mail mekonnenh2016@gmail.com

have been maintained in Mekelle hospital on patients undergoing surgical procedures. Data concerning ages, defect characterization, severity/location of penile curvature, and technique of repair and treatment outcomes were extracted from the operation registry book, surgical ward registers and case notes obtained from medical records office. All pertinent information obtained was filled in a previously prepared protocol sheet and results were expressed using numbers, percentages and tables.

RESULTS

There were 67 patients who underwent hypospadias repair, all in Mekelle Hospital. The age of repair ranged from 8 months to 32 years of life (Table 1). Majority of our cases had distal hypospadias which accounted for 42 (62.7%) followed by mid penile shaft hypospadias in a rate of 18 (26.9%) and the least seen was proximal hypospadias in 7(10.5%) of the cases (Table 2). A total of 17 patients had penile curvatures, of these, 13 cases were of mild type, while the remaining 4 cases had severe penile curvature / chordae. In majority of our cases with penile chordae, degloving of the penile skin while leaving the urethral plate intact was that was required to correct it.

Table 1: Age distribution at repair of hypospadias in Mekelle hospital, Ethiopia. (2012–2015).

Age group in years	Number of patients	Percentage
0-4	14	20.9
5-9	9	13.4
10-14	13	19.4
15-19	16	23.9
20 and above	15	22.4
Total	67	100.00

Table 2: Classification of hypospadias according to meatal location in Mekelle hospital, Ethiopia. (2012-2015).

Location of meatus	Number	Percentage
Anterior	42	62.7
Middle	18	26.9
Posterior	7	10.5
Total	67	100.00

However, in fewer patients where the penile chordae was severe, it was more prudent to divide the urethral plate to totally excise the ventral urethral plate fibrosis and left with skin coverage in preparation for a delayed repair. One stage hypospadias repair was feasible with all the above maneuvers in those with mild chordae except in the cases when the urethra plate was divided and skin covered, in which a delayed 2nd stage urethroplasty was carried out 6 months later in those patients with severe penile curvature. In this study group, most 58 (86.6%) of the patients who had distal, mid penile shaft defects and in selected cases of proximal hypospadias were repaired using tubularized incised plate (TIP) technique in all the cases where there was an adequate urethral mobility without penile curvature and in those patients who underwent orthoplasty with an intact urethral plate (Table 3).

In the remaining patients, where hypospadias were technically not suitable for TIP reconstruction, repair was carried out using Mathieu 7(10.4%) and MAGPI 2(3.0%) procedures depending on their indications (Table 3). In this review study, the surgical repair using tubularized incised plate (TIP) technique has offered our cases an improved penile cosmetic result, normal meatal location, straight penis and a straight urinary stream in standing position in majority 51 (87.9%) of the study subject.

Table 3 : Repair techniques in hypospadias condition in Mekelle hospital, Ethiopia. (2012 -2015).

Techniques	Number of patients	Percentage
TIP/ Snodgrass repair	58	86.6
Mathieu procedure	7	10.4
MAGPI procedure	2	3.0
Total	67	100.00

The optimal window recommended for repair of hypospadias is in ages between 6 to 18 months. When comparing penile size with age, one notes that there is a relatively increased growth during the first few years of life followed by a plateau until puberty. This has prompted some to suggest that the repair be performed between the ages of 2 and 5 years. In comparison to the recommended age of repair, in 14 (20.1%) of the study cases, repair was carried out in ages below 5 years, whereas 22(32.8%) patients had repair in ages between 5-14 years. In the remaining 31 (46.3%) cases, repair urethroplasy was performed between 15-32 years of life as depicted in Table 1, indicating that this urogenital anomaly still remains a taboo in the study area, an inhibition that results from social custom.

Currently many hypospadias surgeons, choosing a one stage repair, prefer to perform the procedure between 6 months and 18 months, an ideal time to minimize the emotional effects of this surgery and the separation of the child from its mother which dictates creation of awareness among the population for early repair of hypospadias. Several complications have been described in various earlier studies and in the literature. In this review, the overall complications encountered were urethrocutaneous fistula 4(6.0%), partial/complete neourethral dehiscence 3(4.5%), neourethral stricture 1(1.5%), hematoma with skin maceration 1(1.5%) and mild oedema which accounted for 9 (13.4%) as shown in Table 4, but in only 7(12.1%) of the cases with TIP repair technique. Re-operative surgery was typically performed no sooner than 6 months after the initial repair, mainly for urethrocutaneous fistula, partial/ complete neourethral dehiscence and neourethral stricture which were all dealt using different techniques without major events.

Table 4: Post operative complications of hypospadias repair in Mekelle hospital, Ethiopia. (2012-2015).

Complications	Meatal Location	Number of patients	Percentage
Urethrocutaneus fistula	Distal, middle	4	6.0%
Partial/ complete neourethral dehiscence	Distal, middle	3	4.5%
Neourethral stricture	Proximal	1	1.5%
Skin maceration (Hematoma)	Middle	1	1.5%
Total		9	13.4%

DISCUSSION

Surgical reconstruction is the only means of correction for hypospadias. Satisfactory achievement of both functional and cosmetic result is critical in the repair of hypospadias (1-3). Hence, failure to achieve both may have profound implication for the patients. Recent studies suggested that hypospadias may have a significant effect on future psychosexual development and patients with hypospadias in the age of 9 to 18 years had a more negative genital appraisal most of the patients desiring functional or cosmetic improvement (1-3).

In other related study, same authors investigated the psychosexual adjustment in patients with hypospadias which demonstrated inhibition in seeking sexual contacts were more likely to have negative genital appraisal (1-9). Studies are scarce on the choices of techniques and repair outcomes in Ethiopia and this review audit is aimed at hinting the repair techniques and the treatment outcomes in Ethiopia, the study area in particular. In this study, there were 67 cases of hypospadias where surgical reconstruction was carried out.

Majority of the hypospadias were distally located in 42(62.7%) of the patients, followed by hypospadias at the mild penile shaft in 18(26.9%) of the study subject. A relatively lower rate of proximal hypospadias 7(10.5%) was observed in this series. Studies carried out in various sections of the western world noted that majority being distal hypospadias which accounted for 70.0%, middle and proximal hypospadias were in the rates of 10.0% and 20.0% of their cases respectively, (1-3) which is consistent to this study subject with slight variations in proportion.

In this congenital uro-genital anomaly, surgical reconstruction offers the patient an improved penile cosmetic result, normal meatal location and straight urinary stream in the standing position. The optimal window recommended age of repair of hypospadias is in ages between 6 to 18 months (1-3, 5-10). When comparing the penile size with age one notes that there is a relatively increased growth during the first few years of life followed by a plateau until puberty. This has prompted some to suggest that the hypospadias repair be performed between the age of 2 and 5 years (1-3, 5-10). Currently many hypospadias surgeons choosing a one stage repair, prefer to perform the procedure between 6 and 18 months(4).

The psychosexual effects of penile surgery have been considered by various earlier studies who have determined that between 6 and 18 months of age is an ideal time for repair to minimize the emotional effects of this surgery and the separation of the child from its mother. (1-4).

A myriad of surgical techniques are used to correct hypospadias and different physicians prefer different methods (2-10). Determining the appropriate technique depended on several factors in this series, including meatal location, appearance of the meatus and glans, presence or absence of chordae, quality of an intact urethra and the patients' circumcision status. In majority of our cases, with mild penile curvature, degloving of the penile skin leaving the urethral plate intact was that was required to correct, a similar experience to various studies worldwide (1-10). One stage hypospadias repair was feasible with all the above maneuvers, except in cases where the urethral plate was divided and skin covered following orthoplasty (correction of the ventral deflection of the penis caused by fibrous tissue) for severe chordae in preparation for delayed 2nd stage urethroplasty usually 6 months later.

In this review, one-stage hypospadias repair utilizing the urethral plate was carried out in majority 58 (86.6%) of our cases, mainly in patients with distal, mid shaft penile hypospadias and in selected cases of proximal hypospadias. TIP (tubularized incised plate) urethroplasty was a repair technique predominantly used in our series which relies upon a midline relaxing incision to widen the urethral plate for urethroplasty without additional skin flaps (5-7, 9, 10). TIP repair technique was carried out in all cases of the study group with an adequate urethral mobility without penile curvatures and in those cases where orthoplasty was carried out for hypospadias with mild penile chordae.

TIP is a recently reported technique and was advocated by Snodgrass which entails incision of intact urethral plate from the meatus to the tip of the glans on the lateral edges and in the dorsal mid line exposing the corporeal bodies. The two urethral plate halves are then anastomosed in the ventral midline, a layer of vascularized subcutaneous tissue is placed to cover the neourethra and the glans wings are approximated. Since its introduction TIP repair technique has gained wide spread popularity, because of its versatility, low complication rate and good cosmetic results (5-7, 9-11). In few instances, this useful technique was also carried out even in proximal hypospadias with mild penile curvatures and selected cases of reoperations (11).

In this study subject, orthoplasty was required and carried out in some of the cases with penile chordae without dividing the urethral plate where in most of the cases one-stage urethroplasty has been achieved using TIP repair technique. The other more traditional methods and perimeatal based flap (Mathieu's) and MAGPI (meatal advancement and glanulopasty) procedures were the techniques used in fewer of our cases where TIP was not suitable for repair of the hypospadias which is consistent to earlier similar studies (12-14), (Table 3).

The optional window recommended for repair of hypospadias is in ages between 6 and 18 months (1-3, 4-10). In comparison to the recommended age of repair, only 14 (20.1%) of the study cases had repair of the hypospadias in ages below 5 years, whereas 22 (32.8%) patients had repair in ages between 5 - 14 years of age group. In 31 (46.3%) of the cases, repair was carried out in ages from 15 to 32 years of life, indicating that this urogenital anomaly still remains a taboo in the population, an inhibition that results from social custom.

From the operative technical points, one of the greatest aids to a one-stage hypospadias repair was an artificial erection (15, 16). Whenever there was a question of chordae and this probability was evaluated at the time of surgery by placing a tourniquet at the base of the penis using a 25 gauge needle, injecting one corpus cavernosum with sterile saline which allowed adequate evaluation of an erection, which is commonly practiced worldwide. (15, 16). Fine delicate instruments were essential for hypospadias surgery. Fine, sharp, pointed Iris scissors, delicate tooth forceps and skin hooks were the mainstay. Absorbable suture was preferred in this series which is recommended elsewhere (4-9) and chromic catgut was by far the most common since it is rapidly absorbed within 10-20 days.

It seemed that the least amount of tubing within the bladder and the avoidance of a balloon catheter was our best policy. In children, a tiny silastic feeding tube of 6-8 F size was placed through the neourethra into the bladder which was the routine practice in our series, agreeable to various earlier studies (2-10). The tube was sutured to the glans and allowed urine to drip into a kidney dish. We have been pleased with the smallest size urethral tubing in older children and adult patients. It is the feeling of various authors that the simplest form of diversion is generally the best (5 -10). The choice of anesthesia has helped greatly during the course of the operation, hence general and spinal anesthetic was preferred in younger children and adult patients respectively.

It is our current practice to do all of the primary cases as in-patient to assure good tissue approximation and skin coverage but most hypospadias repair can be carried out as outpatient procedures/or with only brief stay in a hospital as described by various authors and in the literature (1-3,5-9). With regard to post operative care, the complexity of the operation dictates the follow up cares which includes dressing that act to immobilize the penis, diminish edema and maintain sterility (5-9).

The use of antibiotics, immediate post operatively was the routine practice in our series, although the value in many studies and in the literature is unclear (4-8). We remove the dressing as well as the stent in the ward between the 5th and 10th post operative days. Once the urethral stent has been removed the parents are advised to probe the meatus with an ophthalmic ointment tube to prevent meatal crusting or stenosis which is a similar practice in various earlier studies in the world (1-3, 5-9). Out patients were seen post operatively at 1, 2, 4 and 6 weeks and then at 3 and 6 month intervals.

Finally, parents and patients were advised to observe their urinary stream and evaluate the adequacy of the repair. Several complications have been described in the literature and in various earlier studies (1-3, 5-10). In this series, most of the hypospadias repair was done using TIP technique with complication rate of 7 (12.1%) but the overall morbidity encountered was in a rate of 9 (13.4%) mainly due to urethrocutanous fistula, partial/complete neourethral dehiscence, neourethral stricture hematoma with skin maceration and mild tissue oedema and all dealt without major events. In other study, in TIP urethroplasty a complication rate of 7.0% was noted from results of multicenter experience and other earlier similar studies (9, 17-19) depicting fewer complications which indicate a potential applicability to a wide spectrum hypospadias conditions. Although, the operation is new, these favorable observations encouraged others to begin using the technique, and also inevitably led to its application for proximal hypospadias and selected reoperations, a technique mainly used in this series (5 -12).

Finally, the surgical reconstruction of hypospadias using TIP technique has offered our cases an improved penile cosmetic result, normal meatal location with straight penis, a straight urinary stream in the standing position and the potential for improved fertility.

In conclusion, patient satisfaction rate that exceeded 51 (87.9%) was achieved in this study ensuring that TIP repair technique is the best treatment option for most of the distal, middle penile shaft hypospadias, in selected cases of proximal hypospadias and in cases of re-operations with fewer rates of complication. Fewer cases hypospadias not suitable for TIP repair technique were managed using MAGPI and Mathieu procedures. In this review, the overall complication rate was 9 (13.4%) but in only 7 (12.1%) of the cases with TIP repair technique.

ACKNOWLEDGEMENT

I am very grateful to all who took in the surgical care delivery of the disease patients' .My gratitude also goes to Mekelle Hospital management for allowing me to use the case notes.

REFERENCES

1. Duckett JW. Hypodadias. Campbell's text book of urology 7th ed. 1998:2093-119.
2. Devine CJ, Horton CE. Hypospadias repair. J Urol 1977;118:188-93.
3. Creevy CD (1960).The correction of hypospadias; a review, Urology Survey. 1960; 8:2.
4. Devine CJ Jr & Horton CE. A one-stage hypospadias repair. .Journal of Urology. 1961; 85:166 - 72.
5. Snodgrass W. Tuburalized incised plate hypospadias repair: indications, technique and complications. Urology 1999;54:6
6. Warren T. Snodgrass. Tubularized incised plate (TIP) hypospadias repair. Urol Clin N. Am 29 (2002) 285-90.
7. Snodgrass W. Tubularized incised plate urethroplasty for distal hypospadias. J Urol. 1994; 151:464-5.
8. Mark R. Zaontz, Gregory E. Dean. Glanular hypospadias repair. Urol Clin N Am 29 (2002) 291-98.
9. Snodgrass W, Koyle M, Manzoni G , Hurwitz R, Caldamone A, Ehrlich R. Tuburalized incised plate hypospadias repair ; results of multicenter experience. J Urol. 1996; 156:839.
10. Snodgrass W, Koyle M, Manzoni G , Hurwitz R, Caldamone A, Ehrlich R. Tuburalized incised plate hypo-

spadias repair for proximal hypospadias. J Urol. 1998;159:2129.
11. Retik AB, Borer JG. Primary and re-operative hypospadias with the Snodgrass technique World J Urol. 1998; 16:186.(11)
12. Oswald J, Korner I, Riccabona M. Comparison of the perimeatal based flap (Mathieu) and the tuburalized incised plate urethroplasy (Snodgrass) in primary distal hypospadias. Br J Urol. Int 2000; 85:725-7.
13. Duckett, JW, Snyder HM. The MAGPI hypospadias repair after 1000 cases: avoidance of meatal stemosis and regression. J urol 1992; 147:665-9.
14. Duckett JW. MAGPI (meatoplasy and glanuloplasty). A procedure for subcoronal hypospadias urol Clin North Am. 1981; 8:513-20.
15. Githes RF, Mc Laughline API. Injection technique to induce penile erection, urology. 1974; 4:473-6.
16. Gittes RF Mcaughlin AP III. Injection technique to induce penile erection. Urology. 1974; 4: 473-75
17. Snodgrass W. suture tracts after hypospadias surgery. BJU Int. 1999; 84:843.
18. Duckett JW. The island flap technique for hypospadias repair. Urol. Clin North Am.1981; 8:503-12.
19. Snow BW. Use of tunica vaginalis to prevent fistula in hypospadias surgery. J Urol. 1986; 136:861.