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OUTCOME OF HYPOSPADIAS SURGERY IN CHILDREN;

OUR EXPERIENCE OF 07 YEARS.

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ABSTRACT... Background: Hypospadias is a field of continuous evolving surgery. The aim of surgical treatment is to restore the normal appearance and function of Penis. The outcome of surgery largely varies and depends upon type and severity of anomaly, associated factors, type of surgery performed and skills of surgeon. **Study Design:** Descriptive, prospective study. **Setting:** Department of Pediatric Surgery, Military Hospital Rawalpindi and Combined Military Hospital Lahore. **Period:** 07 years, from October 2010 to October 2017. **Methods:** Report and analyze the types of hypospadias, choice of surgery along with outcome of surgical repair. All patients operated for Hypospadias surgery were divided in three groups according to age for the purpose of convenience of data collection. **Results:** A total of 142 surgeries were done on 131 patients were operated (In 09 patient's stage 2 was performed). Distal penile hypospadias was the most common variety. One stage repair was performed in 83 patients. Two staged repair was decided in 59 patients. Among them 09 are done with second stage urethroplasty. Urethrocutanous fistula was the most common complication in 31 patients followed by bleeding, blocked tube, urine leakage from meatus, splayed stream, wound infection, disrupted glans, torsion of penile shaft and meatal stenosis. **Conclusion:** Hypospadias surgery is a continuous learning process, one should master in one or two techniques with its intricacies. Meticulous preoperative assessment of anomaly, accurate selection of surgical procedure, proper tissue handling and vigilant follow up are required for good outcome and least complications.

Key words: Chordee, Hypospadias, Snod Grass, Staged Repair, Urethrocutanous Fistula.

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INTRODUCTION

Hypospadias surgery is a complex surgery. Outcome largely depends upon the original anatomy and tissues available for repair. Relatively high index of complications are reported in literature than the other cosmetic surgeries.[1] Various surgical procedures are practiced and adopted by surgeons through the evolution and expansion of Hypospadiology to achieve the ultimate goal of normal looking and functioning penis. Choice of surgical procedure depends upon the severity of the defect, tissue available for reconstruction, associated anomalies and experience of operating surgeons.[2] The wide diversity of surgical options and divergent surgical views show unsatisfactory results of surgery with frequent complications. A degree of flexibility is required to address the different spectrum of presentation of each patient. Pre-operative assessment of the type of anomaly, size of penis shaft, glans diameter, quality of proximal skin, formation of urethral tubes, presence of chordee and presence of associated anomalies play integral role in defining the time and type of repair needs to be employed on individual basis.[1,3] One stage tabularized incised urethroplasty (TIP) is the standard approach for anterior Hypospadias repair since 1994 with minimal complications.[3] Proximal Hypospadias with severe Chordee is associated with complex surgical reconstruction and many postoperative complications when dealt in single stage. Bracka A. offers a staged procedure in patients of proximal hypospadias along with distal chordee and poor urethral plates, which shows better aesthetic and functional outcome.[4] In first stage maximal straightening of penis is achieved by chordee correction and placing of a free graft of genital or extra genital

skin on ventral raw surface of penis and wide spread wings of glans, replacing deficient urethral plates. After 6 months to 1 year in second stage surgery, grafted skin on ventral surface provides ample tissue for urethroplasty.

Although many centers have presented theirs good outcome of single stage repair in most proximal Hypospadias, however at our center, we felt safe in doing staged repair.

Over the period of 07 years, we report the outcome of hypospadias surgery in our patients during our learning curve in limited resources in terms of sutures and dressings available.

A prospective descriptive study was done in the Department of Pediatric Surgery Military Hospital Rawalpindi and Combined Military Hospital Lahore from Oct 2010 to Oct 2017, to evaluate the different types of Hypospadias and associated anomalies. The type of repair employed, post operative outcome and complications were noted.

MATERIALS AND METHODS

All patients who were operated for Hypospadias surgery for the first time were included in the study. Timing of surgery was decided depending upon size of the phallus, age of patient at presentation and availability of slot on operation list. Detailed preoperative assessment was done to document the site of meatus, size of penis, size of glans, urethral plates, distal chordee and proximal skin of shaft of penis.

All re do surgeries, fistula repair and meatal stenosis were not included in this study.

Patients were divided in three groups according to their age at the time of surgery, for convenience of documentation. Group A includes patients less than 2 years of age, Group B includes patients from 02-05 years of age while group C contains patients between 05 to 12 years of age. All patients who were uncircumcised at the time of presentation, they were advised not to get circumcision done.

In total 04 Glandular Hypospadias, Meatal Advancement and Glanduloplasty (MAGPI) was considered the appropriate choice of surgery. Tabularized incised urethroplasty (TIP) was done in all anterior Hypospadias as well as in proximal and mid penile Hypospadias without proximal chordee. In all patients who had mid penile or proximal Hypospadias with distal penile or glandular chordee, staged repairs were planned after counseling of parents.

Patients having small glans and short penile length and diameter, narrow urethral plates and defective proximal skin, preoperative injectable testosterone were given at 1-3 months prior to the repair in order to increase penile length, glans circumference and vascularity of skin and tissues, in dose of 25 mg intramuscular once a month for 1-3 months.

PDS 5/0 or 6/0 was the preferable suture material but due to resources constrains and non availability of surgical loupes, 5/0 or 6/0 vicryl was used in almost half of patients. Feeding tube, 7-8 gauges was used as urethral stent in all patients. Dressing was done with Sofratual or Bactrigrass wrapped around penis and covered with gauze and anchored with sticking plasters in flower shaped dressing. Dressing was only changed if gets soaked with urine or blood. Intravenous broad spectrum Cephalosporin was given for 1 day followed by one week of oral antibiotics. In proximal repairs, injectable antibiotic covering gram negative was also added. Bladder antispasmodic tab Detropan 2mg was given only if child have severe pain due to bladder spasm. All patients were kept in hospital due to cultural constrains of particular patient population entitled for extended indoor treatment in hospital. Stent was removed on 7-8 post operative day under sedation in dressing room. Urinary stream was observed and patient was discharged with advice to keep hygiene of the area. Follow ups were done at one week, one month then every month for six month, if all is well. If found some complications like meatal stenosis. Follow up was frequently done for meatal or urethral dilatation. Postoperative complications like wound infections, wound disruption, urethral

fistula and meatus stenosis were recorded during these follow ups.

In all stage 1 surgeries, prepucial skin graft was applied, except in 02 patients in whom buccal mucosal graft was applied because of non availability of prepucial skin due to circumcision. Catheter was placed out of dressing, next day patient was discharged with dressing and on oral antibiotics. On 5-6th day dressing was removed. Second stage surgery was planned at least after 6 month of first stage surgery.

RESULTS

A total number of 142 patients were operated. Patients were divided in 03 groups according to age. In our patients hypospadias was present in 1 or 2 brothers of the patient, in 16 % of patients. The associated anomalies were noted in 29% of patients. Among associated anomalies, 05% were the component of DSD anomalies, 5 % have UDT, 2% had inguinal hernia, and 0.3 % had ARM. Group A, included, 28/142 (19.71%) patients, who were less than 02 years of age. Two of them had glandular hypospadias in which MAGPI was done without ant complications, TIP urethroplasty was done in 15/28 (53.57%) patients. (Figure-1) Postoperatively 03/15 (20.00%) of them had urethral fistula while meatal stenosis and disruption of wound secondary to infection were found each in one patients. Stage 1 was performed in 11/28 (39.28%) patients. Post operatively 02 patients had wound infection resulting in graft rejection in 01 patient and residual chordee in the other patient. None of them has yet completed with stage 2 urethroplasty. (Figure-2).

Group B comprised of 29/142 (20.42%) patients who were between 2-5 years of age. One patient with glandular hypospadias was dealt with MAGPI with good outcome. TIP was done in 08/29 (27.58%) patients. Postoperatively 04/08 patients (50.00%) developed urethral fistulas initially which was closed spontaneously after 4- 6 months in 02 patients while 02 patients had residual fistula after 6 months to be repaired surgically. (Figure-4) Two patients had initial bleeding from the wound which stopped after pressure dressing for 24 hours. One patient had wound infection which was treated with oral antibiotics for 01 week.

Out of these 29 patients, 20 (68.96%) were operated for stage one surgery. Postoperative complications were noted as superficial skin infection in 02 patients, 01 patient had graft contracture and 01 had graft rejection. Two patients out of these 29 were operated for staged 2 procedures. Postoperatively after stage 2, 01 patient had failed repair with glans disruption.

Group C included a total of 85/142 (59.85%) patients who were between the age of 5-12 years. One patient with glandular hypospadias was dealt with MAGPI with good outcome. A total of 56 / 85 (65.88%) were operated for Snod grass repair. Post operatively 21 / 65 (32.30%) had urethral fistula, 04 had splayed urinary stream, 01 patient had superficial wound infection and 01 patient has penile skin necrosis. 28 / 85 (32.94%) patient underwent stage 1 repair. The post operative complications noted were infection of the graft in 02 patients while 02 patoents had contracture and residual ventral chordee while graft was rejected in 01 patient. Among these 56 patients, 07 patients had completed with stage 2 repair. Post operatively 03 had urethral fistula while failed repair due to disruption of wound occurred in 01 patient. (Table-I)

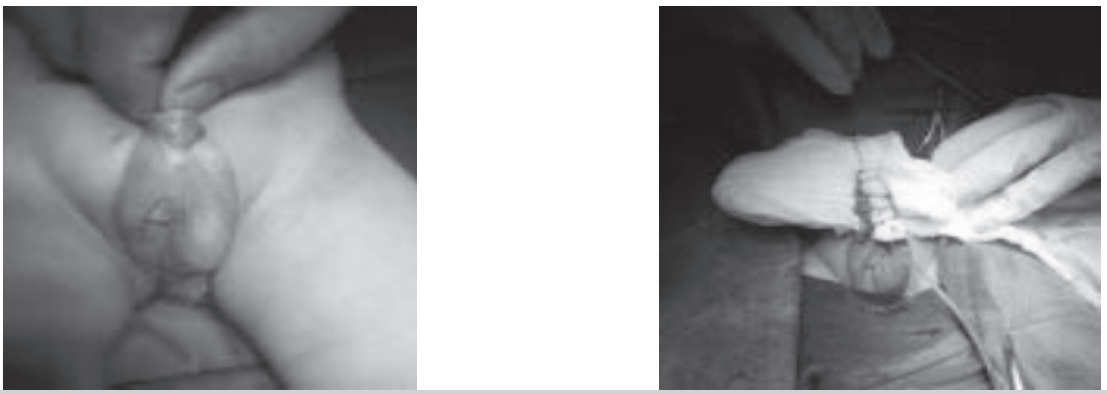
DISCUSSION

Hypospadias is usually picked up by the parents soon after birth. Less severe degree may be diagnosed by early treating physician at the time of circumcision with mild chordee and/prepucial hood or after circumcision by noticing the abnormal position of urethral opening. Glandular hypospadias may have minimal apparent deformity even prepuce hood is missing and urethral meatus is only visible when prepuce is retracted at the time of circumcision.

It's not necessary to not get circumcision done in anterior hypospadias but we advised them to save prepucial skin. Prepucial skin may be used in repair later on and circumcision can be done along with urethroplasty.[5]

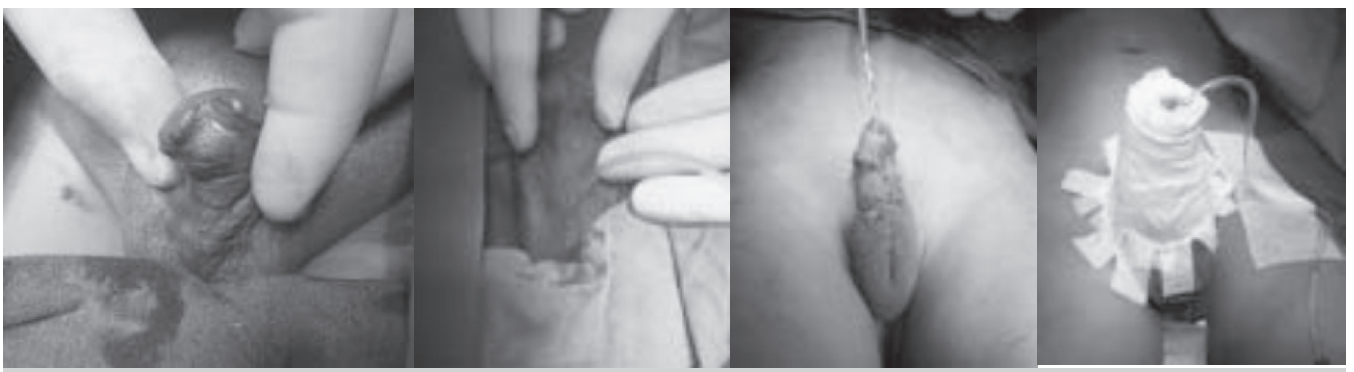
Anterior hypospadias with good urethral plates | TIP is done | 1 week after taking urethral tube out

Figure-1. TIP repair



Bracka stage 1 in penoscortal hypospadias (right orchidopexy has been done 15 days before) | Dressing and urethral tube placement in Bracka 1

Figure-2. Stage 1 repair



Penoscortal hypospadias for stage 2 | Ample Soft and pliable grafted skin is available for stage 2 urethroplasty | Repair is covered with v-y flaps of shaft of penis | Pic- 1 dressing with sofratuel covered with guaze and sticking plaster

Figure-3. Stage 2 repairs

Figure-4. Subcoronal fistulas were the commonest complication

	Age	MAGPI	Snod grass (TIP)	Bracka Stage 1	Bracka Stage 2	Complications out of total numbers
Group A	< 02 years	02	15	11		28
Complications in Group A patients		none	Meatal - stenosis- 01 Fistula- 03 Disruption 01	Infection-01 Graft rejection And Residual chordee- 01	None	07 (25.00%)
Group B	2-5 years	01	08	20	02	29
Complications in Group B patients			Bleeding 02 Wound infection 01 Fistula 04	Infection 02 Rejection 01 Contracture 01	Glans disruption 01	12 (41.37%)
Group C	5-12 years	01	56	28	07	85
Complications in Group C patients			Wound infection 01 Fistula 21 Skin necrosis01 Splayed stream 04	Infection 02 Rejection 01 Contracture02	Failed repair 01 Fistula 03	36 (42.35%)

Table-I. Post operative complications in hypospadias surgery in our patients

In our patients hypospadias was present in 1 or 2 brothers in 16 % of patients. In literature, reported incidence of hypospadias in family is 4-15% (6-7). Regarding the associated anomalies 29% were the component of DSD anomalies, 5 % have UDT, 2% had inguinal hernia, and 0.3 % had ARM which is almost identical to the reported literature.[7-8]

Hypospadias and its associated anomalies have great adverse effects on cosmetic appearance of genitalia and psychosexual life later on. The aims of surgery are anatomical corrections including arthroplasty, urethroplasty, meatoplasty, glanduloplasty and circumcised appearance. As our follow up was from 06 months to 05 years maximum, our aim was to note down the outcome in terms of postoperative complication, however, the functional outcome can be assessed by ability to pass urine in parabolic curve in standing position and sexual outcome in later life by prolong follow up of the patients.[1,9]

Through the evolution of hypospadiology, most surgeons recommend to do surgery between 6-18 months.[10] Owing to the factor, that between 18 months to 2.5 years of age, a kid is hyperactive and it's very difficult to retain urethral stent for about a week. Majority of our patients (85/142 = 59.85%) presented after 5 years of age perhaps due to unawareness about the problem among parents or due to the cosmetic nature of problem with anterior hypospadias. For ease of data collection patients were divided in three groups. Group A contains patients less than 02 years of age and group B contains patients who were between 2-4 years of age at the time of surgery while C group included patients presented after 5 years of age. If penis size was found small, it was optimized with recommended injectable testosterone, 15- 25 mg intramuscular once a month for 1-3 doses.[11] Though literature does not show any solid evidence that testosterone can decrease post operative complications.[12]

Different surgical procedures are described in literature for different kind of hypospadias, however we performed MAGPI in only 04 cases of glandular hyposapdias with no postoperative complications.

All anterior hypospadias were operated for tabularized incised plate urethroplasty, while posterior hypospadias including mid penile once those were having associated glandular chordee, were dealt in staged procedure, in the view of literature.[3,4,9]

Follow up schedule was made as once a week for 2 weeks then once monthly for two months then after 6 months and then yearly. Regarding the post operative complications, subcoronal urethrocutanous fistula was the commonest complication, noted in 31 out of total 92 urethroplasties (33.69%), which is slightly on higher side in relation to the reported incidences.[1,8] Parents or child were taught to place finger over fistula and try to pass urine through neo meatus. It was observed that 50 % of fistulae closed spontaneously within period of six month which is almost equal to the reported literature. The causes of fistula were infection, ischemia of the tissue, urine leakage, hematoma and local edema. Due to non availability of 6/0 vicryl or PDS sutures, vicryl 4/0 or 5/0 was used may also have contributed towards wound infection or tissue ischemia.[1,13]

Through our learning curve, it was learnt that coverage of neo urethral tube with vascularised prepucial flap or dartos facial tissues or periurethral tissues in second layer covering the neo urethra after adequate mobilization of corpus spongiosum decrease the chances of fistula.[14,15]

Though there is an increasing trend of operating posterior hypospadias in one stage but at our center we do staged repair in all proximal hypospadias with associated chordee considering that 2 staged is reliable and refined. Literature showed that there is not much difference in terms of outcome in expert hands but we experienced that it is a difficult task to release the ventral curvature and simultaneous urethroplasty along with coverage of skin. Due to deficiency of urethral plates and covering tissues, it may not be possible to straighten the penis completely and prepare the ventral surface for urethroplasty.[4,16,17]

In total 59 patients, Bracka stage 1 was done. Adequate mobilization of glans wings done followed by inner prepucial grafting on raw ventral surface of penis giving flexibility of tissues available for second stage in TIP. The commonest postoperative complication was infection of graft leading to rejection, contraction and rejection of graft in 11 cases. Second stage was planned after 6months to 1 year. A total 09 patients are completed with second stage repair yet. Postoperatively, 03 of them had urethrocutanous fistula while 01 patient each have disruption of wound and disruption of glans. It was noted that rate of complication was increased as severity of hypospadias is more.

During post operative follow up of TIP and Bracka 2, some of them needed meatal or urethral dilatations, which was done weekly in outpatient with 7G nasogastric tube or taught to the parents to be done at home.

All parents and patients were satisfied with cosmetic circumcised appearance of penis regardless of meatal complications. However we feel that a detailed and prolonged follow up is needed to report the physiological and functional results in later age.

CONCLUSIONS

- Learning curve in hypospadias surgery is continuously ongoing throughout the career of a surgeon.
- It's better to choose one or two technique and try to master in that.
- Urethral fistula is commonest post operative complication of Hypospadias surgery probably owning to high infection rate in our set up. Rate of post operative complications can be reduced with surgeon's experience, preoperative judicial use of testosterone, appropriate application of the surgical procedure to the appropriate patient, meticulous surgical technique and vigilant postoperative follow up.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Naima Rasool	Concept, perception of the idea, collection of data, writing, editing and proof reading.