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A single center experience of urethro-cutaneous fistula in post Aivar Bracka repair meatal stenosis

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Abstract

Introduction: Hypospadias is a common congenital anomaly of the urogenital system, with an incidence of 1:300, in males. Hypospadias is defined as an anomaly involving the ventral aspect of the penis. Urethro-cutaneous (UC) fistula complicating hypospadias repair appears the most common problem. The incidence of Urethro-cutaneous fistula varies from 4% to 28%.

Objective: To determine the frequency of urethrocutaneous fistula in post Aivar Bracka repair meatal stenosis.

Materials and Methods: This study was conducted at Department of Plastic and reconstructive Surgery unit, Hayatabad Medical Complex Peshawar, from march 2014 to march 2016. Study design was descriptive cross-sectional study and the duration of the study was 2 years in which 82 patients were observed by using WHO formula for sample size, expected prevalence of 22% of fistula, 95% confidence Interval and margin of error of 9%. Non-probability consecutive sampling technique was used for sample collection.

Results: In our sample, 72% patients were in age range 3-6 years, 28% patients were in age range 7-10 years. Mean age was 3 years with SD±1.31. Overall 20% patients had urethrocutaneous fistula. Stratification of urethro-cutaneous fistula with age distribution was analyzed, showing that 12 patients with urethro-cutaneous fistula were in age range 3-6 years and 4 patients were in age range 7-10 years. The difference in fistula frequency between the two age groups was statistically significant ($p < 0.01$).

Conclusion: Our study concludes that 20% of patients with meatal stenosis develop urethro-cutaneous fistula after aivar bracka repair, and the frequency is higher in the younger age group.

Keywords: urethro-cutaneous fistula, aivar braka repair, meatal stenosis

Introduction:

Hypospadias is one of the most common congenital anomalies occurring in approximately 1 in 200 to 1 in 300 live births, defined by abortive development of the urethral spongiosum, the ventral prepuce and in more severe cases penile chordee. Abnormally located meatus can be found any where along the ventral side of shaft of the penis or perineum.[1,2] The etiology of hypospadias remained unknown with environmental exposure in the form of endocrine disruptors the most likely explanation for the world-wide increase in incidence in the last three decades.[1,2] One possible explanation for the world-wide increase in the incidence may be because of environmental chemicals and pesticide exposure.[3]

The sequential steps for the successful repair of hypospadias are orthoplasty, urethroplasty, meatoplasty, glanuloplasty and prepucioplasty.[4] The goals of hypospadias reconstruction is to create a straight penis that is adequate for sexual intercourse, to allow the patient to void while standing with a straight urinary stream.

More than 350 procedures have been described

for the correction of this anomaly. Aivar Bracka (AB) procedure is a two stage procedure for correction of hypospadias. The most widely practiced procedures include Mathieu's repair, tubularized incised plate(TIP) urethroplasty, Thiersh-Duplay, Mustarde, Meatal advancement and glanuloplasty incorporation (MAGPI).[5]

The final results of hypospadias repair depends not only on the severity and site of the meatus and but more importantly on the adequacy of appropriately instituted surgical procedure and technique.[6]

Complications following hypospadias repair include early complications like edema, post-operative bleeding, infections and late complications such as urethro-cutaneous (UC) fistula, meatal stenosis, strictures, diverticula and urinary tract infections. Amongst these urethrocutaneous fistula and meatal stenosis are the most common.[7,8]

As literature search did not reveal any previous regional studies on urethro-cutaneous Fistula with meatal stenosis in Post-Aivar Bracka repair. Some studies have reported the occurrence of UC fistula in meatal stenosis but the results vary widely due to small sample sizes. The rationale of this study is to determine the frequency of UC fistula in post Aivar Bracka repair meatal stenosis. This data is important in terms of establishing a baseline for fistula formation after Aivar Bracka repair in Peshawar. It will also help us in scheduling proper follow-ups for patients with meatal stenosis.

Study setting: Department of Plastic and reconstructive surgery unit, Hayatabad Medical Complex Peshawar

Study Duration: 2 years (march 2014 to march 2016)

Study Design: Descriptive

Sampling technique: Non-probability consecutive sampling

Inclusion criteria: All patients of age 3 to 10 years admitted for stage II Aivar Bracka repair. Preputial skin used in stageI Aivar Bracka repair. Distal penile hypospadias. Surgery performed by same consultant with at least 5 yrs experience.

Exclusion criteria: Crippled hypospadias, Perineal hypospadias, severe chordee, patients with uncontrolled bleeding diathesis as detected by medical history and immuno-compromised patients like Diabetes (FBS > 126mg/dl, history of intake of steroids and patient with HIV/AIDS on previous medical records. The above-mentioned conditions may act as confounders and was therefore excluded to reduce the possibility of introducing bias in the study.

Ethical approval was approved from the institutional review board of the hospital. Only those patients who provide informed consent was included in the study and personal information was kept confidential.

Data collection was done using a structured proforma. All patients were enrolled through OPD/ already admitted in the ward for the study. Complete history and physical examination was carried out in all the patients. All the surgeries were performed under aseptic precautions by the same surgeon having at least 5 years post fellowship experience, in the operating theatre under general anesthesia and loupe magnification. All the patients who had undergone the first of stage of Aivar Bracka repair six months ago were re-admitted for the second stage repair. They were examined for the suppleness and adequacy of the grafted urethral plate. Chordee was re-evaluated to detect any residual element. Standard second stage of Aivar Bracka was performed. Vicryl 6/0 was used for neo-urethra tubularization and Vicryl Rapide 6/0 for subdermal skin closure. All patients were dressed adequately. Patients were discharged home with silicone catheter. First follow up was done on seventh post-operative day. The catheter was removed and patients were observed for urinary stream and any abnormal leakage at sites other than the meatus. Local examination including fistula site, meatal stenosis detected by observing urinary stream was done till the last follow up at 3months.

Table-1: Outcomes (n=82)

Outcome		Frequency	Percentage
Urethrocutaneous fistula	Yes	16	20%
	No	66	80%
Total		82	100%

Table-2: Stratification of outcomes with age (n=82)

Outcome		3-6 years	7-10 years	Total	p-value
Urethrocutaneous fistula	Yes	12 (20.3%)	4 (17.4%)	16	0.003
	No	47 (79.7%)	19 (82.6%)	66	
Total		59(100%)	23(100%)	82	

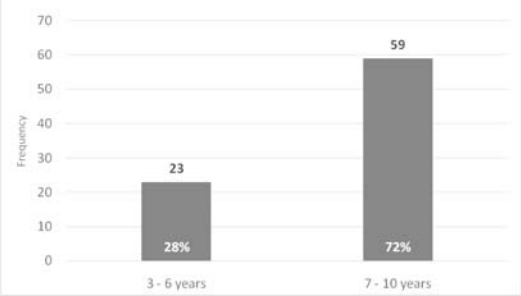

Fig. 1: Age distribution of sample

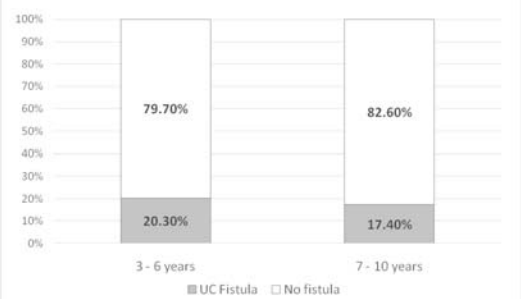

Fig. 2: Comparison of fistula frequency across age groups

Data was analyzed on SPSS version 10. Mean and S.D was calculated for continuous data i.e. age. Frequencies and percentages were calculated for categorical data i.e. frequency of urethro-cutaneous fistula and meatal stenosis. Frequency of urethro-cutaneous fistula was stratified among age to see effect modification. Results were presented in the form of tables and figures.

Results:

This study was conducted at Plastic & Reconstructive Surgery unit, Hayatabad Medical Complex, Peshawar in which a total of 82 patients were observed to determine the frequency of urethro-cutaneous fistula in patients with post Aivar Bracka repair meatal stenosis and the results were analyzed as below.

Mean age in our sample was 3 years (SD ±1.31). Among the 82 patients observed, 59(72%) patients were in age range of 3-6 years, while 23(28%) patients were in the 7-10 years age group.

Of the 82 patients with post Aivar Bracka repair with meatal stenosis, a total of 16(20%) patients had Urethro-cutaneous fistula while 66(80%) patients did not. Stratification of urethrocutaneous fistula with age distribution was analyzed to assess any differences in age groups. Of those who had fistula, we found 12 (20.3%) patients in age group 3-6 years, 4 (17.4%) patients were in age range 7-10 years (table-1). The difference was statistically significant (p = 0.003).

Discussion:

Hypospadias surgery is continuously evolving since its description by Celsius and Galen. In spite of better short-term outcomes in the past 2 decades, the long-term results are yet to be established. In the current study we evaluated the protocols, results, and effect modifiers of hypospadias repair at our centre.

Mean age in our study was 3 years with SD ±1.31. 20% patients had urethro-cutaneous fistula. Stratification of urethro-cutaneous fistula with age distribution was analyzed as in total of 16 patients with urethro-cutaneous fistula, 12 patients were in age range 3-6 years, 4 patients were in age range 7-10 years.

For all types of repair, the complication rate was 56%, consisting mainly of urethro-cutaneous fistula (35%) and meatal stenosis (5-20%).[8-11] However this rate was 4.94% and 8.64% respectively in another study.[12]

In a study conducted by oseremen.[13] the overall complication rate was 50%, the most common chronic complication was UCF (urethrocutaneous fistula), i.e. 37.3%, of which 55.5% were managed by single surgical procedure while 11.1% by multiple surgical procedures. While

33.3% of fistulas closed spontaneously during 1-3 months postoperatively leaving the corrected frequency of UCF as 25%. This frequency was highest for proximal hypospadias. The second most common late complication was meatal stenosis observed in 12.5% patients. Relatively lower frequency of 9% for UCF was observed by[14] in another study population. Urethrocutaneous fistula was noticed in 20% of cases in the current study. This frequency is comparable to the previously mentioned studies

The overall frequency of complication and UC fistula was significantly higher for residents than specialist plastic surgeons which signify the long learning curve for hypospadias repair,[15] Ansari reported results consistent with our observation about the learning curve of hypospadias repair.

This frequency was low for two-stage repair than for single-stage repair.[16] To assess the long-term outcome of hypospadias repair is a challenging job due to the difficulties in acquiring data.[17] J adams reported excellent long term functional (voiding, sexual function, psycho-sexual adjustment, and self-appraisal) results despite initial higher frequencies of complications with a satisfaction rate of 86%.

Conclusion:
Our study concludes that 20% of patients with meatal stenosis after Aivar Bracka repair had urethro-cutaneous fistula. The two staged Aivar Bracka's repair constitutes a viable technique for almost all types of hypospadias with an acceptable outcome in terms of fistula formation.

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Role and contribution of authors:
Dr Adeeba Ahmed, collected the data, references and wrote the initial writeup.

Dr Muhammad Shadman, collected the references and helped in introduction writing.

Dr Fahim Ullah, collected the data and helped in discussion writing.

Dr Waqas Hayat, collected the data, references and helped in discussion and result writing.

Dr Tahmeedullah, critically review the article and made the final changes.

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