



FISTULA FORMATION AFTER TWO STAGED AIVAR BRACKA'S REPAIR FOR HYPOSPADIAS.

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ABSTRACT... Objectives: To evaluate the frequency of fistula formation after Bracka's repair for hypospadias. **Study Design:** Retrospective Case study. **Setting:** Department of Plastic and Reconstructive Surgery, Shaikh Zayed hospital Lahore and Bahawal Victoria Hospital Bahawalpur. **Period:** 05 years (2014 -18). **Material & Methods:** Sixty patients of primary hypospadias underwent two staged Aivar Bracka's repair. Age of patients, type of hypospadias, presence and extent of chordee, donor skin (preputial, post auricular) used, complications and fistula formation were recorded. Leakage of urine from repair site (Primary/Secondary) was noted as fistula formation after 03 weeks postoperatively. **Results:** A total of 60 patients underwent two staged Bracka's repair. There were 32 patients (53.33%) with distal hypospadias, 16 patients (26.67%) with mid penile and 12 Patients (20%) with proximal hypospadias. Chordee was present in 33 Patients (55%). Prepuccial skin was used in 46 Patients (76.66%) and post auricular skin in 14 Patients (23.34%) as a donor graft. Four patients (6.66%) developed fistula. 03 patients (5.00%) developed fistula at primary site and 01 patient (1.66%) developed at secondary site. Post auricular skin was used as a donor graft in all 04 patients developing fistula. **Conclusion:** Two staged Bracka's repair is a versatile technique and reliable procedure for hypospadias repair with minimal complications and is applicable to all types of hypospadias due to excellent functional and cosmetic outcome.

Key words. Aivar Bracka, Chordee, Hypospadias.

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INTRODUCTION

Hypospadias is one of common congenital anomalies occurring 1 in 300 male children. Urethral opening is on ventral aspect of the penis or in the perineum and is associated with the absence of distal urethra and corpus spongiosum.¹ The diagnosis is quite apparent and can be made at birth. Patients experience various degree of functional disabilities. The stream may be deflected ventrally.²

The correction of hypospadias remains one of the most challenging problems. More than 300 procedures have been described but none of these procedures can be universally applied to all types of hypospadias.³ Complications from surgery for hypospadias are post-operative bleeding, loss of skin graft loss, skin flap necrosis, fistula formation, urinary stricture, meatal stenosis / retraction, hypertrophic scar and ugly scar.⁴

Out of many post-operative complications, fistula formation is the most common and ranges from 5 to 45% depending upon the stage and type of procedure. This also points out the prognosis of the procedure.⁵ Various factors are implicated in fistula formation such as infection, trauma, poor healing rough handling, tension over repair and in appropriate use of suture.⁶

Fistula is not due to faulty technique but other factors like back pressure, turbulence, skin bridges, hair on neo urethra.⁷ Due to fistula, the person faces social, functional problems like poor stream during urination, wetting of cloths, and as well as aesthetic problems. The risk of urinary tract and penile soft tissue infection is also increased.⁸

The two staged Bracka's of hypospadias is a versatile technique and is applicable to all types of

hypospadias even in salvage cases with minimal complications with full thickness graft in 1st stage as a urethral plate for urethral reconstruction. We routinely use two staged Aivar Bracka's repair for all types of hypospadias and get good results as compared to other procedures. The objective of this study is to evaluate the frequency of fistula formation after two staged Bracka's repair for hypospadias

MATERIAL & METHODS

This study was conducted at Burn & Plastic and reconstructive unit of Aziz Bhatti Shaheed Teaching Hospital Gujrat and Bahawal Victoria Hospital Bahawalpur Pakistan over a period of 05 years (2014 -18).

A total of 60 patients of all types of primary hypospadias undergoing Bracka's repair were included in the study. A through history and physical examination including age, site, type of hypospadias, presence and extent of chordee, quality and quantity of donor skin were recorded preoperatively. The patients were followed up on 2nd week, 6th week, 3 month and 6 months. The fistula was suspected as leakage of urine through any opening other than urinary meatus and confirmed by applying soft catheter around the base of penis and injecting normal saline through meatus and observing leakage of urine.

During the first stage, all patients underwent Bracka's hypospadias repair under general anaesthesia and tourniquet control around base of penis proximal to ectopic meatus if space available. The degree of chordee was assessed by Horton's test. An axial and two lateral incisions were made from ectopic meatus to proposed dorsal limit of new urethra and in subcoronal area from midline. The preputial skin is harvested if adequately available; otherwise post auricular skin is used to cover raw area. The marked area of prepuce was incised, dissected and thinned out over finger to remove surplus connective tissue. It was stored in normal saline soaked gauze. Midline and lateral incisions are made and dissection is done up to distal limit of two corpora cavernosa. Horton test is performed again after removal of fibrous tissue till penis becomes

straight. The donor skin was placed and tie over dressing was applied and fixed with 4/0 prolene suture. Foley catheter was removed on 2th post-operative day and tie over dressing was removed after 5th day. The patient was discharged with the instructions of wound care, excessive drinking water, urination and follow up. After 6 week, patient was advised about method of massage of the graft and application of some lubricant. The patient was followed up every month for 6 months to see the condition of the graft.

During 2nd stage, the patient was re admitted 6 months after 1st stage and assessed physically and graft wise. After anaesthesia, Horton test was performed to confirm that correction was adequate. A U shaped incision over the skin is marked with care to make tube easily. Silicone catheter was passed and tourniquet was applied. Incision was made and dissection was done up to dorsal surface to allow mobilization of skin envelop along buck's fascia plane down to level proximal meatus. The tube was made comfortably without tension. The meatus was reconstructed first by joining ventral points with 7/0 (Polydioxanone) PDS. Rest of urethral tube was made with combination of interrupted and continuous sutures.

A proximal based flap of subcutaneous tissue was raised from dorsal hood and transposed ventrally to cover reconstructed tube and fixed with 7/0 (Polydioxanone) PDS suture. This flap formed Waterproofing and is used to cover the first layer taking care that two layers are separated from each other. The skin was closed as a third layer. The tourniquet was released to see bleeding and haemostasis was done with bipolar cautery. A dressing is done around penis and left in place for seven days. The Foley's catheter secured safely on abdominal wall and removed on 7th day.

RESULTS

Mean age was 5.5 years with (range 2-10 yrs). 32 patients (53.33%) were of distal, 16 patients (26.67%) of mid penile and 12 patients (20%) of proximal hypospadias. Chordee was present in 33 patients (55.00%) and absent in 27 Patients (45%). As a graft, preputial skin was used in 46

% patients (76.66%) and post auricular skin in 14 Patients (23.34%). Out of total 60 patients, total complications developed in 11 patients (18.33%). Hematoma in 02 % (3.33%), urinary retention in 03 patients (5.00%), wound dehiscence in 02 Patients (3.33%) and fistula developed in 04 patients (6.6%), 03 patients (05.00%) developed on primary site and 01 patient (1.66%) at secondary site.

Sr. No.	Age (Yrs)	No. of Patients	Percentage %
1.	2-4	22	36.66
2.	5-6	19	31.66
3.	7-8	11	18.33
4.	9-10	08	13.33
5.	Total	60	100.00

Table-I. Age distribution of patients.
Total Patients. 60

Sr. No.	Type of Hypospadias	No. of Patients	Percentage %
1.	Distal Penile	32	53.33
2.	Mid Penile	16	26.67
3.	Proximal Penile	12	20.00
4.	Total	60	100.00

Table-II. Types of hypospadias.
Total Patients. 60

Sr. No.	Significant Chordee	No. of Patients	Percentage %
1.	Present	33	55.00
2.	Absent	27	45.00
3.	Total	60	100.00

Table-III. Chordee.
Total Patients. 60

Sr. No	Graft Site.	No. of Patients	Percentage %
1.	Preputial skin	46	76.66
2.	Post Auricular Skin	14	23.34
3.	Total	100	100.00

Table-IV. Donor site for graft.
Total Patients. 60

Type of Hypospadias		Complications					Total
		None	Haemat-oma	Urinary Retention	Wound dehisce-	Fistula	
1	Distal	30	0	1	1	0	32
2	Mid penile	12	1	1	1	1	16
3	Proximal	07	1	1	0	3	12
Total		49	2	3	2	4	60

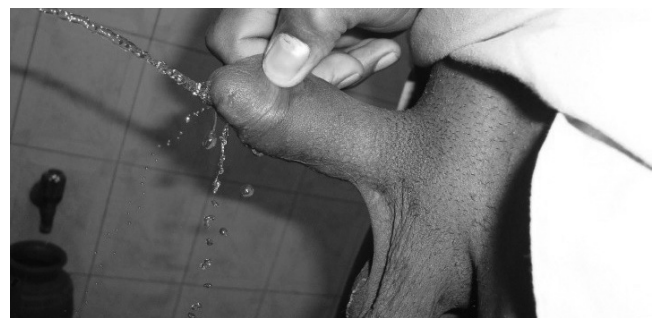
Table-V. Post Operative complications.
Total Patients. 60

Type of Hypospadias		Site of Fistula			Total
		None	Primary	Secondary	
1	Distal	32	0	0	32
2	Mid penile	15	1	0	16
3	Proximal	9	2	1	12
Total		56	3	1	60

Table-VI.
Total Patients. 60



Fistula in Proximal Hypospadias.



Fistula in Distal Hypospadias

DISCUSSION

The surgical goal in patients with hypospadias is to construct a straight penis with meatus as close as possible to normal site to allow forwarded directed stream and normal coitus.⁹ Among a large number of surgical procedures for hypospadias, two staged Bracka's repair is one of the most effective method to achieve above goals. A large numbers of complications are associated with hypospadias repair. Among common and uncommon postoperative complications, fistula formation is most common.¹⁰

Fistula formation after hypospadias repair is a parameter of success in any type of procedure whether it is a single or two staged procedure. Fistula formation after repair must be viewed in context of an overall evaluation of repair. The evaluation should include final meatal position and shape, urinary stream and straightness on erection.⁶ Postoperative fistula caused too much embarrassment for the surgeon as well as for parents. Various factors are implicated in fistula formation such as infection, trauma, poor healing, rough tissue handling, excessive use of cautery, too much tension over repair and inappropriate use of sutures.¹¹ Apart from above factors, fistula formation is not due to faulty technique but also unseen factors like back pressure, turbulence, increased sheared stress due to narrowing, skin bridges, hair on irregular surface of urethra.¹² Despite careful pre-operative evaluation and planning, meticulous surgical technique, optical magnification, skilled assistance and modern material, a proportion of patients continue to suffer this complication.^{6,13}

In two staged repair of hypospadias, multiple options are available to form tube for neo urethra like prepucial skin, hairless skin (post auricular skin), urinary bladder mucosa, buccal mucosa and tunica vaginalis.¹⁴ In the present study, most common graft used for neourethra was prepucial skin due to its availability, pliability and thinness and was used in 46% (76.66%) and post auricular skin in 14 patients (23.34%). Tahmeedullah et al. mentioned very good results of prepucial skin relating to it take and rate of

fistula formation is very low as compared to post auricular skin and buccal mucosal graft. He gave his postoperative fistula rate 3.12% of prepucial skin, 5% of postauricular skin and 5.8 % of buccal mucosa graft as compared to 5.1%, 13.6% and 8.8% respectively.¹⁵ Manzoni et al. reported 67 patients in which prepucial skin was used as a free graft in 46 patients and graft from other sites in 21 patients in case of poorly developed/ absent prepuce.¹⁶

In this study, fistula developed in 04 patients (6.6%) after two staged bracka's repair. This study is comparable to original Aivar Bracka's study in 1995, Fistula were reported to be 10.5%. Out of total 04 fistulas, 03 fistulae developed in proximal hypospadias and 01 in middle hypospadias. Out of total 04 fistulae 03 patients developed fistula at primary site (site of ectopic meatus) and 01 developed at secondary site (other than ectopic meatus).¹⁷ Holland A. J et al. observed increased incidence of fistula formation risk in proximal hypospadias.⁶ In 2005, Obaidullah and Aslam applied two staged bracka's repair on 1206 cases and reported over all fistula rate 5.9%.¹¹

As most of the hypospadias are of distal type (50-70%) but urethrocutaneous fistulae develop frequently in complex repair of middle and proximal hypospadias.¹⁸ In this study, 03 fistulae (75%) of developed in proximal and 01 fistula (25%) of the total 04 fistulae developed in middle hypospadias. In 2007, Hansson et al. observed about 87% of fistulae develop in proximal and middle hypospadias. Marraco also noted increased complications in proximal hypospadias.¹⁹

Risk factors to develop fistula include proximal type, presence and extent of chordee, increasing age, haematoma, urinary distal obstruction, wound dehiscence, tension over repair, failure of inverted margins, inappropriate suture material and ischemia.⁶ The 2nd layer of neourethra (Proximally based Dartos fascia from dorsolateral aspect of penis) between skin and graft is very important to reduce fistula formation. In 2005, Aslam and Obaiudullah reported the importance of fascia from venterolateral aspect of phallus in

order to reduce operative time and morbidity and fistula.²⁰

Fistula complication accepted by surgeons of average about 10-20%.²¹ Our results are comparable to other studies. Ahmed M et al. had fistula rate of about 10.7% after two staged hypospadias repair.²² Weinberg et al. noted 77.7% of total complications rate with fistula formation in 44.4%.²³ Snodgrass noted 13.33% fistula rate in total complication of 20%.²⁴ Using Snodgrass technique, Shanberg achieved good result with fistula rate 7.69% and Yang got fistula rate of about 28% with same technique.²⁵ In 2005, Caken et al. observed fistula rate of 21.6% within previous reports between 15-33%.²⁴ While Bracka's himself described fistula rate of 5.7% in 1995.²⁶

CONCLUSION

It is concluded that two staged Bracka's repair is a versatile, unique and reliable procedure and is applicable for all types of hypospadias with minimal complications as compared to other procedures. It not only produces a normal looking slit like meatus but also almost scar less ventral surface of penis. Moreover, the appearance of penis is acceptable for patients as well as for surgeon. Due to excellent results, Bracka's procedure can be promoted as a repair of hypospadias.

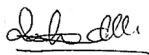


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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Zahid Iqbal Bhatti	Collection of data & Writing.	
2	Husnain Khan	Collection of data & Analysis tool.	
3	Firdous Khan	Performed analysis.	
4	Mughese Amin	Performed the analysis & guidance.	