FREQUENCY OF EARLY COMPLICATIONS AFTER TWO STAGED AIVAR BRACKA (AB) REPAIR OF HYPOSPADIAS

Habibullah Shah, Uzair Ahmed Qazi, Huma Gul, Saadia Atta Khan, Rashid khan

ABSTRACT

Hypospadias is a congenital anomaly in which due to the incomplete fusion of urethral folds the meatus opens on the ventral surface of the penis. It s the most common congenital malformation of the urethra with the prevalence of 1 in 200-300 live male births. The early complications are edema, hematoma and wound infection which occur within one week after the 1st stage of the procedure. The aim of the study is to determine the frequency of early complications of two staged AB repair. The rationale of the study is that if the early complications rate of two staged AB repair comes out significantly lower than other studies then it will help reconsider the existing guidelines of hypospadias surgery.

MATERIAL AND METHODS: This study was conducted at Plastic and reconstructive unit Hayatabad Medical Complex Peshawar for the period of 24 months (from August 2011 to July 2013). The total sample size was 369 patients. More over this was a descriptive cross-sectional study in which non-probability consecutive sampling technique was used.

RESULTS: In this study mean age was 3 years with standard deviation ± 1.24. All the patients were male in which 35% patients had edema, 4% patients had hematoma, and 2% patients had wound infection.

CONCLUSION: The most common early complication is edema and it can be reduced by meticulous handling of tissue and use of loupe magnification, the operative time is reduced to less than 60 minutes to prevent prolonged use of tourniquet.

KEY WORDS: Hypospadias, Aivar Bracka, 2 staged hypospadias repair, edema.

INTRODUCTION

Hypospadias is derived from the Greek words hypo, which means below, and spadon, which means rent or hole. Hypospadias is the common congenital anomaly of the penis with an incidence of about 1 in 300 male live births[1]. Great variations exist in the prevalence of hypospadias most likely because of differences in genetics, environment, geography and in part to the differences in data collection methods[2]. The dorsal aspect of the penis is most often normal in hypospadias. Three associated anomalies classically found in hypospadias are; an ectopic meatus, a ventral curvature of the penis (chordee), and a defect of the ventral prepuce[3]. This chordee is due to the differences in length of the ventral and the dorsal sides of the penis known as corporocavernosal disproportion[4]. The urethral meatus is positioned ectopically and lies some where proximal to the normal site at the tip of glans ventrally. It may open onto the scrotum or perineum in severe cases. The extent of malformation of the urethral opening varies as well. In some cases it is widely gaping and resembling the mouth of a fish[2,4]. At least 70% of hypospadias is either glandular or distal penile and rest are mid penile and more severe proximal type[5]. The foreskin on the ventral surface is deficient, while that on the dorsal surface is abundant, giving the appearance of a dorsal hood. Histologically, the urethral plate consists of well-vascularised tissue with large endothelial sinuses lined around an abortive urethral spongiosum[6]. This leads to fibrosis and cicatrisation of urethral plate and at times leads to chordee formation[7].

The most common associated anomalies are cryptorchidism and inguinal hernia[8]. Approximately 8% to 10% of boys with hypospadias have cryptorchidism and 9% to 15% have an associated inguinal hernia[8,9]. The etiology of hypospadias remains unknown with environmental exposure in the form of endocrine disruptors, the most likely explanation for the worldwide increase in the last three decades[3,10]. Interferences in the androgen metabolism, for example, 5α-reductase deficit, defects of the androgen receptor, or gene defects are possible etiological factors for hypospadia, that are only found in <5% of the patients [8,11]. Hypospadias is also found as a part of different syndromes. Laboratory studies are not usually indicated for isolated anterior or middle hypospadias. Screening for a urinary tract anomaly, by renal ultrasonography, should be considered in patients with posterior hypospadias and in those with an anomaly of at least one additional organ system. In patients with cryptorchidism or ambiguos genitalia, karyotyping should be considered[12].

The sequential steps for the successful repair of hypospadias are orthoplasty, urethroplasty, meatoplasty, glanuloplasty and prepucioplasty[13]. More than 300 procedures described for hypospadias recon-

Department of Plastic Surgery HMC Peshawar

Address for correspondence:
Dr. Habib Ullah Shah
Department of Plastic Surgery HMC Peshawar
E-mail: drhabibullahshah@gmail.com
Cell: 0334-8800339

struction are evidence to both surgical ingenuity and dissatisfaction with the resultant solutions[14]. Among the choice of procedures for distal hypospadias is plate preservation procedures, like incised plate urethroplasty (Snodgrass), glans approximation procedures and Mathieu flip-flap repair, whereas for proximal hypospadias is extended application of incised plate urethroplasty with (snodgraft) or without graft, various flaps and graft urethroplasties, like Aivar Bracka in one or two stages[15]. Amongst the various methods reconstructing the hypospadic urethra, the two stages Aivar Bracka repair has gained steady popularity worldwide during the last two decades[16]. It is now more frequently performed in patients with inadequate urethral plate associated with moderate to severe chordee[17]. In fact hypospadias surgery carries very high complication rate even in experienced hands[18]. Complication rate depends on the severity of the anomaly[19]. So far the commonest complication has been fistula formation[17]. Urethral stricture, scarring, Chordee and painful erection are other trades off from various surgical procedures[20]. However, in the early post operative period, the most common complications are edema,hematoma and wound infection.

The goals of hypospadias reconstruction is to create a straight penis that is adequate for sexual intercourse, to reposition the urethral meatus to the penile tip to allow the patient to void while standing, to create a neourethra of adequate and uniform caliber and an aesthetically acceptable penis with a slit like vertically located meatus[21,22].

In 1995, Aivar Bracka introduced his versatile two stage technique, fulfilling all the goals, in almost all types of hypospadias[13]. It offers a repair which is easy to learn and addresses full extent of chordee. It is a reproducible procedure and needs no specialized center. The aesthetic results are always worth mentioning[23]. Since then this technique has gained steady popularity worldwide. Impressed with excellent published results, we started this technique in our unit. The purpose of this study is to determine the frequency of early complications of this technique. Efforts will be made to improve upon the surgical technique and to minimize these complications, thereby decreasing the post operative morbidity of our patients.

METHODS

This study was carried out in the Plastic and reconstructive unit of Hayatabad Medical Complex, Peshawar, Pakistan from August 2011 to July 2013. A total number of 370patients were included in the study.

The inclusion criteria was set to include all male patients of any age group presenting with hypospadias and the exclusion criteriawas set to exclude all previously operated cases or hypospadias cripples. Patients with ambiguous genitalia diagnosed by clinical examination with the findings of genitalia which could not be assigned to either sex were also excluded from the study.

All male patients with hypospadias (diagnosed by clinical findings of meatal opening on the ventral surface of the penis) fulfilling the inclusion criteria was enrolled from Out-patients' department and referral from other departments. An informed consent was taken from all the patients after explaining the study protocol. After detailed clinical history and physical examination, all the hypospadias patients were subjected to two staged AB repair by plastic and reconstructive surgeons (with at least 5 years post-fellowship experience in hypospadias repair). In the first stage chordee (abnormal ventral curvature due to fibrosis) was released with sharp dissection and the wound was covered with inner preputial full thickness skin graft to provide the deficient urethral plate. The 2ndstage was performed after 6 months in which the grafted area of the penis was tabularized over a silicon urinary catheter with Polygalactone 6-0 suture. The catheter was removed on 7th post-operative day.

All the patients was observed for early complication in the post operative period to detect early complication like hematoma,edema, and wound infection.

The details were recorded in a specialized performa structured with the help of a statistician. The exclusion criteria had strictly followed to exclude confounders and bias in the results.

RESULTS

Age distribution among the 370 patients was analyzed as most of the patients n=296(80%) were in age range 3-7 years followed by n=67(18%) patients were in age range 8-15 years and n=7(2%) patients were in age range 15-20 years (as shown in Table No. 1).Mean age was 3 years with standard deviation ± 1.24.

Duration of surgery was analyzed as n=340(92%) patients were operated in less 60 minutes, whereas, n=30(8%) patients operated in more than 60 minutes. Mean duration of surgery was 30minutes with standard deviation ± 2.41. (as shown in Table No 2).

Frequency of early compilations among our patients was analyzed as n=130(35%) patients had edema, n=15(4%) patients had hematoma and n=7(2%) patients had wound infection (as shown in Table No. 3).

Association of compilations with age distribution was analyzed as in 130 cases of edema, 109 patients were in age range 3-7 years, 18 patients were in age range 8-15 years and 3 patients were in age range 15-20 years. In 15 cases of hematoma, 13 patients were in age range 3-7 years, 2 patients were in age range 8-15 years. In 7cases of wound infection, 3 patients were in age range 3-7 years, 2 patients were in age range 8-15 years and 2 patients were in age range 15-20 years. (as shown in Table No. 4).

Association of compilations with duration of

surgery was analyzed as in 130 cases of edema, 123 patients were operated in < 1 hour and 7 patients were operated in > 1 hours. In 15 cases of hematoma, 14 patients were operated in < 1 hour and 1 patient was operated in > 1 hours. In 7 cases of wound infection all the 7 patients were operated in < 1 hour. (As shown in Table No. 5).

Table No 1: Age distribution (n=370)

AGE DISTRIBUTION	FREQUENCY	PERCENTAGE
3-7 year	296	80%
8-15 year	67	18%
15-20 year	7	2%
Total	370	100%

Table No 2: Duration of surgery (n=370)

Duration of Surgery	FREQUENCY	PERCENTAGE
< 1 hour	340	92%
> 1 hour	30	8%
Total	370	100%
Total	370	100%

Table No 3: Complications (n=370)

COMPLICATIONS	FREQUENCY	PERCENTAGE
Early complications		
Edema	130	35%
Hematoma	15	4%
Wound Infection	7	2%

Table No 4: Association of complications in age group (n=370)

COMPLICATIONS VS AGE	3-7 years	8-15 years	15-20 years	Total
Early complications				
Edema	109	18	3	130
Hematoma	13	2		15
Wound Infection	3	2	2	7

Table No 5: Association of complications in duration of surgery (n=370)

COMPLICATIONS VS AGE	< 1 hour	> 1 hour	Total
Early Complication			
Edema	123	7	130
Hematoma	14	1	15
Wound Infection	7		7

DISCUSSION

The Aivar Bracka (two stage) repair is a simple technical innovation that has revolutionized hypospadias surgery. In 2000, Rickwood AM[24] published his result of 367 cases. He advocates a modern two stage terminalising repair that could produce an even caliber hairless neourethra with a vertically slit meatus and glans configuration. Not only did the result proved to be more sophisticated than with the available single stage methods, but also the surgery was relatively straightforward, reliable and reproduceable.[24]

The majority of clinicians across KPK, Pakistan, use the Aivar Bracka two stage repair (88%), Snodgrass (43%) or MAGPI (43%)[40]. Aslam et al,[40] in a 10-year review, highlight the advantages of the Bracka two stage repair in treating broad spectrum of pathologies with good outcome. They highlight the advantages of a normal looking slit like meatus (unlike MAGPI), ability to deal with chordee, scarless ventral surface and its universal application (unlike Snodgrass), and hence requiring surgeons to master only one technique[40].

There are several reasons for the great popularity of this technique, including its technical simplicity, and its great versatility and excellent cosmetic results. Furthermore, being uniquely versatile it could be used as a universal repair for almost all types of hypospadias deformity. For a resident plastic surgeon dealing with a still modest number of hypospadias patients, being able

to master one straight forward principle of repair and produce refined results in a broad spectrum of primary and re-operative problems is undoubtedly appealing[42].

In fact, hypospadias surgery carries very high complication rate even in experienced hands[43]. Complication rate depends on the severity of the anomaly. Our study shows that the incidence of hypospadias was found more in age range 3-7 years as 80% patients were found in the same age group. Secondly, most of the patients (92%) were operated in less than 60 minutes. Similar results were found in study done by Aslam M et al[43] in which most of the patients (90%) were in the age range 3-9 years.

Our study shows that the most commonly occurring complication was Edema which was found in 35 % patients followed by hematoma found in 4% patients, wound infection was found in 2% patients. Similar results were quoted in another study done by Aslam et al[43] in which edema was found in 30% patients, hematoma was found in 2% patients and wound infection was found in 1% patients.Similar results were also quoted by Obaidullah et al[45].

Complications are common after hypospadias repair, ranging from fistulae to complete loss of the neo-urethra requiring total reconstruction[44]. Even in experienced hands, hypospadias repairis associated with the development of post operative edema.

In the current study the mean age was 3 years with SD+1.24 which is comparable with 4.21} 4.4 years shown by Tabassi KT et al.[47] in their study from Iran and contrary to 22.72} 7.75 months by Al-Saied et al.[48] in their study from Saudi Arabia.

The location of the hypospadia in our study (48.5% had distal penile hypospadia while 24.2% had coronal hypospadia) is similar to the results reported by Tabassi KT et al.[47] (distal penile in 59% cases).

CONCLUSION

The current study concludes that post-operative edema is the most common early complication of hypospadia repair, its rate is directly proportional to the operative time. To reduce the frequency of early postoperative edema, we recommend that the surgery is done under loupe magnification under experienced hands, good lighting and tissues are handled very gently and measures be taken to reduce tourniquet time.

REFERENCES

1. Hayashi Y, Kojima Y. Current concepts in hypospadias surgery. Int J Urol 2008;15(8):651-64.
2. Gallentine ML, Morey AF, Thompson IM. Hypospadias:a contemporary epidemiologic assessment. Urology 2001;57:788–90.
3. Baskin LS, Ebber MB. Hypospadias: anatomy, etiology and technique. J Pediatric Surg 2006;41(3):463-72.
4. Leung AK, Robson WL. Hypospadias: an update. Asian J Androl 2007;9(1):16-22.
5. Bath AS, Bhandari PS, Mukherjee MK, Repair of distal Hypospadias by the tabularized incised plate Urethroplasty: A simple versatile technique. Indian J Plast Surg 2003; 36(1):23-5.
6. Erol A, Baskin LS, Li YW, Liu WH. Anatomical studies of the urethral plate: why preservation of the urethral plate is important in hypospadias repair. BJU International 2000;85(6):728–734.
7. Catti M, Demede D, Valmale AF, Mure PY, Hameury F, Mouriquand P. Management of severe hypospadias. Indian J Urol 2008;24(2):233-40.
8. Khuri FJ, Hardy BE, Churchill BM. Urologic anomalies associated with hypospadias. Urol Clin North Am 1981;8: 565–71.
9. Wang MH, Baskin LS. Endocrine Disruptors, Genital Development, and Hypospadias. J Androl 2008;29:499–5.
10. Hinman FJ. Penis and Male Urethra. Atlas of Urosurgical Anatomy. Philadelphia, Pa: WB Saunders 1993:417–70.
11. Belman AB. Hypospadias update. Urology 1997;49: 166–72.
12. Keating MA, Duckett JW. Hypospadiology: Hand book of genito-urinary surgery vol1. 2nd ed. Blackwill Science Ltd 1998;319-36.
13. Bracka A. Role of two-stage repair in modern hypospadiology. Indian J Urol 2008;24(2):210-218.
14. Aslam M, Obaidullah, Majid A. Two stage Aivar Bracka repair in hypospadias salvage cases. J Postgraduate Med Institute 2006;20(2):203-6.
15. Bracka A. Hypospadias repair: The two-stage alternative. Br J Urol 1995;76 (3):31-41.
16. Haxhirexha KN, Castagnetti M, Rigamonti W, Manzoni GA. Two-stage repair in hypospadias. Indian J Urol 2008;24(2):226-32.
17. Aslam M, Obaidullah, Mumtaz N. Outcome of UrethraCutaneous fistula repair after Hypospadias. Pakistan J Med Res 2005;44(1):23-6.
18. Bhat A, Mandal AK. Acute postoperative complications of hypospadias repair. Indian J Urol 2008;24(2):241-8.
19. Chrzan R, Dik P, Klijin AJ, De-jong TP. Quality assessment of Hypospadias repair with emphasis on techniques used and experience of pediatric urologic surgeons. Urology 2007;70(1):148-52
20. Djordjecvic ML, PerovicSV, Salvkovic Z, Djakovic N. Longitudinal dorsal dartos flap for prevention of fistula after a Snodgrass Hypospadias procedure. Eur Urol 2006;50(1): 53-7.
21. Snodgrass WT. Snodgrass technique for hypospadias repair. BJU Int 2005;95:683–93.
22. Soomro NA, Neal DE. Treatment of hypospadias: an update of current practice. Hosp Med 1998;59:553–6.

23. Obaildullah, Aslam M. Ten year review of Hypospadias surgery from a single center. BJPS 2005;58(6):780-89.

24. Rickwood AM, Anderson PA. Two stage hypospadias repair:experience of 367 cases. Br J Urol 1991;67:424-28.

25. Powel CR, Mcaleer I, Alagiri M, Kaplan GW. Comparison of flaps versus grafts in proximal hypospadias surgery. J Urol 2000;163:1286–88.

26. Nuininga JE, de Gier RPE, Verschuren R, Feitz WF. Long term outcome of different types of one stage hypospadias repair. J Urol 2005;174:1544–48.

27. Duckett JW, Kaplan GW, Woodard JR. Panel: complications of hypospadias repair. Urol Clin North Am 1980;7:443-44.

28. Elbarky A. Complications of the preputial island flap tube urethroplasty. Br J Urol Int 1999;84:89–94.

29. Nonomura K, Kakizaki H, Shimoda N, Koyama T, Murakumo M, Koyanagi T. Surgical repair of anterior hypospadias with fish mouth meatus and intact prepuce based on anatomical characteristics. Eur Urol 1998;34:368–71.

30. Gangopadhyay AN, Sharma S. Peha-haft bandage as a new dressing for pediatric hypospadias repair. Indian J Plast Surg 2005;38:162–64.

31. Ratan SK, Sen A, Ratan J, Pandey RM. Mercurochrome as an adjunct to local preoperative preparation in children undergoing hypospadias repair. Br J Urol Int 2001;88:259–62.

32. Guo Y, Ma G, Ge Z. Comparison of the Mathieu and the Snodgrass urethroplasty in distal hypospadias repair. Zhonghua Nan Ke Xue 2004;10:916–8.

33. Elbakry A, Shamaa M, Al-Atrash G. An axially vascularized meatal based flap for the repair of hypospadias. Br J Urol 1998;82:698–03.

34. Savanelli A, Esposito C, Settimi A. A prospective randomized comparative study on the use of ventral subcutaneous flap to prevent fistulas in the Snodgrass repair for distal hypospadias. World J Urol 2007;25:641–45.

35. Lay L, Zamboni WA, Texter JH, Zook EG. Analysis of hypospadias and fistula repair. Am Surg 1995;61:537–38.

36. Retik AB, Keating MA, Mandell J. Complications of hypospadias surgery. Urol Clin North Am 1988,15:223-36.

37. Bracka A. Sexuality after hypospadias repair. BJU Int 1999;83:29–33.

38. Rey RA, Codner E, Iníguez G, Bedecarrás P, Trigo R, Okuma C, et al. Low risk of impaired testicular Sertoli and Leydig cell functions in boys with isolated hypospadias. J Clin Endocrinol Metab 2005;90:6035–40.

39. Aho MO, Tammela OK, Somppi EM, Tammela TL. Sexual and social life of men operated in childhood for hypospadias and phimosis. Eur Urol 2000;37:95–101.

40. Aslam M, Obaidullah, Majid A. Two Stage Aivar Bracka repairin hypospadias salvage cases. JPMI 2006;20(2):203-6.

41. Bracka A. Hypospadias repair: The two-stage alternative. Br J Urol 1995;76(3):31-41.

42. Chrzan R, Dik P, Klijin AJ, de-Jong TP. Quality assessment of Hypospadias repair with emphasis on techniques used and experience of pediatric urologic surgeons. Urology 2007;70(1):148-52.

43. Aslam M, Obaidullah, Mumtaz N. Outcome of Urethracutaneous fistula repair after Hypospadias. Pakistan J.Med.Res 2005;44(1):23-6.

44. Djordjecvic ML, PerovicSV, Salvkovic Z, Djakovic N. Longitudinal dorsal dartos flap for prevention of fistula after a Snodgrass Hypospadias procedure. Eur-Urol 2006;50(1): 53-7.

45. Obaildullah, Aslam M, Ten year review of Hypospadias surgery from a single center. BJPS 2005;58(6):780-89.

46. Rickwood AM, Anderson PA. One-stage hypospadias repair:experience of 367 cases. Br J Urol 1991;67:424-28.

47. Tabassi KT, Mohammadi S. Tunica Vaginalis Flap as a Second Layer for Tubularized Incised Plate Urethroplasty. Urol J 2010;7:254-7.

48. Al-Saied G, Gamal A. Versatility of tubularized incised plate urethroplasty in the management of diff erent types of hypospadias: 5-year experience. Afr J Paediatr Surg 2009;6:88-92