



COMPARATIVE EVALUATION OF BUCCAL MUCOSAL GRAFT AND TRANSVERSE PREPUTIAL ISLAND FLAP IN PROXIMAL HYPOSPADIAS AND HYPOSPADIAS CRIPPLE

Surgery

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ABSTRACT

Introduction: Hypospadias is a common congenital defect of male child which occur due to abnormal development of the penis. Meatal position may be located anywhere along the penile shaft, but more severe forms of hypospadias may have a urethral meatus located at the scrotum or perineum. Various methods for urethral reconstructions for hypospadias are used but with various complications. We have evaluated the outcome of buccal mucosal graft in proximal hypospadias and hypospadias cripple when local tissue is not sufficient for reconstruction.

Material & Methods: This prospective study was carried out in Burn and Plastic Surgery unit of N S C B Medical College for one year. Study comprised of patients of proximal penile hypospadias, penoscrotal hypospadias and hypospadias cripple in the age group of 1 to 14 years undergone for urethral reconstruction.

Results & Observations: Maximum patients were of below 5 year (66.66%). Majority of cases had severe degree of chordee and 27.27% cases were having moderate degree of chordee. 72.22% cases have reported no complications. Pin hole meatus was the most common associated anomaly in 11.11% cases.

Conclusions: Majority of cases had severe degree of chordee. Associated congenital anomalies were seen in 22.22% cases. Most of the complications were associated with the Asopa III technique.

KEYWORDS

Hypospadias, Buccal mucosal graft, Transverse preputial island flap

Introduction

Hypospadias results from abnormal development of the penis that leaves the urethral meatus proximal to its normal glanular position anywhere along the penile shaft, scrotum, or perineum. A spectrum of abnormalities, including ventral curvature of the penis (chordee), a "hooded" incomplete prepuce, and an abortive corpora spongiosum, are commonly associated with hypospadias. Hypospadiology is a term coined by John W. Duckett, Jr., the former chief of the Division of Urology at the Children's Hospital of Philadelphia (CHOP) and a pioneer in hypospadias repairs.¹ In India, every year more than 100,000 (1 lakh) kids are born with hypospadias.² Hypospadias is recognized as a pediatric urological disorder, the incidence of which is on the rise over the last two decades. The last few studies have noted the incidence of hypospadias to be almost 1/150 newborn boys. This is substantial as compared to what was reported to be 1/250 boys two decades back. Study conducted by hypospadias foundation reported that incidence of hypospadias is 1/126 babies in India. Extrapolating these figures, there will be around 110,000 babies born with Hypospadias every year in India.³

Hypospadias is one of the most common congenital anomalies, affecting one in 250–300 live births. Evidence supporting each factor exists, but no single cause can explain the relatively high incidence of this condition; the cause is probably multifactorial. Few studies have established the rising rate of hypospadias in male child born before the date and small for gestational age.⁴ Buccal mucosa graft (BMG) was first use as a urethral reconstructing tool by Humby in 1941. He used a lower lip graft for a patient with multiple hypospadias repair presented with penoscrotal fistula. Various factors have contributed to the acknowledgement of buccal mucosal grafts (BMGs) as an ideal substitute for the urethra, including easy accessibility and manual handling, resistance to infection, compatibility with a wet environment, a thick epithelium and a thin lamina propria, and favorable graft host vascular relationship allowing early inosculation.⁵ Hypospadias is the most common congenital malformation affecting the penis with incidence approaching 1% of newborn boys. The use of prepuce for urethroplasty, popular now, was first reported by Liston in 1838, Rochet in 1899, Russell in 1900, and Mayo in 1901. The two stage repair performed in the early 20th century differed from that in the early 21st century in that urethroplasty was performed in the first stage and only anastomosis to the original meatus was performed in the second stage. The two-stage repair, currently known as Bracka's two-stage repair, was first described in 1962 by Cloutier.⁶ The present study is conducted to assess the outcome of buccal mucosal graft in proximal hypospadias and hypospadias cripple when local tissue is not sufficient for urethral construction and comparing it's result with transverse preputial Island flap in the Plastic Surgery Unit, Department of

Surgery, N S C B Medical College, Jabalpur.

Aim & Objectives:

This study was conducted to assess the outcomes of buccal mucosa graft and transverse preputial island flap technique in proximal hypospadias and hypospadias cripple patients.

Material & Methods:

Present study was conducted in cases presented with proximal hypospadias, penoscrotal hypospadias and hypospadias cripple attended Burn and Plastic Surgery Unit, N S C B Medical College Jabalpur after written consent. Patients were of age group from 01- 14 years and selected for study after complete history and physical examination. Patients with anterior hypospadias were excluded from the study. Asopa III technique and buccal mucosa graft as tube and as a onlay patch graft were the operating procedures used. Patients were kept under observation for at least ten days and post operative complications were studied under headings of urethrocuteaneous fistula, flap necrosis, infection, hematoma, residual chordee, ventrifixion and meatal stenosis. and discharged on 10th post operative day with instruction of some oral urinary antiseptics and local application of antibiotic cream. Patients were again evaluated on 7th day of discharge from hospital. Data was analyzed and presented as percentage of total.

Result & Observations:

Youngest operated case in our study was one year old whereas the oldest patient was 14 years old. 66.66% cases presented between 0-5 years age group while 33.33% cases were above the age of 5 years. Depending upon the degree of curvature of penis all the cases were divided as mild, moderate and severe chordee. Out of total 18 cases the percentage of mild, moderate and severe chordee were 00%, 27.77%, and 66.66% respectively. One patient presented with no chordee. 77.77% cases were not having any associated congenital anomaly while inguinal hernia, undescending testis and pin hole meatus were found to be associated in 5.55%, 5.55% and 11.11% cases respectively. The techniques used in this study were Modified Asopa (III, Transverse preputial island flap), Buccal mucosa as a tube graft and buccal mucosa as onlay patch graft. Complications observed in patients operated with different techniques were presented in table-1. The rate of complications was 36.36% (4/11 cases) in TPIF method whereas it was 14.28% (1/7 cases) with buccal mucosa graft technique. Fistula rate was 14.28% in buccal mucosa graft technique as compared to 18.18% with TPIF. Meatal stenosis was seen in two patients out of 11 patients (18.18%) operated with TPIF technique but not seen in cases operated with buccal mucosa graft technique.

Table-1 Complications observed in different repair techniques

S. NO.	Type of Complications	TPIF	BMG-T	BMG-O	S. NO.	Type of Complications	TPIF	BMG-T	BMG-O
1	urethrocutaneous fistula	2	1	0	5	residual chordee,	0	0	0
2	flap necrosis	0	0	0	6	ventrifixion	0	0	0
3	infection	0	0	0	7	meatal stenosis	2	0	0
4	hematoma	0	0	0	8	Meatal Retraction	0	0	0
					9	Urethral stricture	0	0	0

Discussion:

Surgical repair of the hypospadias is a big challenge to the surgeons because of the availability of different operative techniques which is a testimony to the fact that no single technique is accepted by all surgeons and no single technique can give optimum results in every case. The suitable technique may be different for different patients according to the type of hypospadias. The fact that there are over 250 methods of surgical correction of hypospadias described in the literature indicates that the "hypospadiologists" are still in search of the ideal technique. The statement: "There is nothing new in surgery not previously described" is especially true as far as hypospadias repair is concerned, because many so believed new techniques were, as a matter of fact, originally described in historical documents and books.⁷ In our study only one case were under one year age and maximum incidence of cases were under age of 5 years, 12/18 cases (66.66%). This may be due to lack of awareness of parents of the patients. The result of this study for age incidence were similar with the study by Ud Din I et al who had reported that most common age of presentation was five years while patients ranging from 2 to 12 year age group.⁸

Timing of surgery is decided on the basis of anaesthesia's risk, penile size, and psychosocial development of the infant. The tolerance to anaesthesia is good at the age of 6 months. The difference in the penile length at one year and preschool age is 8 millimetre only. After 18 months the children enter a behavioural phase of development uncooperative for hospitalization. In the background of these facts, using microsurgical instruments and magnification, 6–18 months is the most suitable age for hypospadias repair.⁹

Out of 18 cases with chordee majority of cases had severe degree of chordee i.e. 12 cases (66.66%) followed by moderate degree of chordee i.e. 5 cases (27.27%). Only one case was found without chordee. In our study majority of cases have severe degree of chordee because almost all cases are of proximal hypospadias type. Devine and Horton classified chordee without hypospadias into three types. Type 1 represents the deficiency of corpus spongiosum and Buck's and dartos fascia from the site of chordee to the glans. In type 2 the spongiosum is normal, while the dartos and Buck's fasciae are dysgenetic. In type 3 corpus spongiosum and Buck's fascia are normal but dartos fascia is deficient. Kramer and colleagues added type 4, which results from corporeal disproportion and Type 5 which is termed congenital short urethra. The study by Polat et al reported forty patients (39%) were of group 1 chordee, 31 patients (30%) as group 2, 27 patients (27%) as group 3 and 4 patients (4%) as group 4.¹⁰

In our study congenital hernia was found in 5.55% (1/18 cases). The incidence of undescended testis was 5.55% and pin hole meatus was seen in 11.11% (2/18) Cases. A study by Nissen K B et al¹¹ submitted that the relationship between associated congenital anomalies and a more severe phenotype has also been shown for other anomalies such as facial clefts and neural tube defects. The hypospadias cases with multiple congenital anomalies also had a lower birth weight and were more frequently small for gestational age than the isolated hypospadias cases. Although in our study the relation with maternal age or birth weight were not studied but other associated anomalies as mentioned above were studied.

In our study three techniques were used for reconstruction for hypospadias namely modified Asopa (III) technique, buccal mucosa as a tube graft and buccal mucosa as an onlay patch graft. The complications associated with these two techniques were represented in table one which shows that urethrocutaneous fistula and meatal stenosis were two common complications which were seen in patients operated by TPIF technique. There was no case of residual chordee in our study probably because of use of Gittes procedure in every case. Patients treated with buccal mucosal graft techniques showed no

serious complications apart from urethral fistula in one case which got closed spontaneously two months after operation without need of re-operation

In our study overall complication rate was 14.28% which was slightly lower in comparison to the study conducted by Fichtner J et al¹² (24%) but this study concluded that buccal mucosa onlay grafts for urethral reconstruction in hypospadias repair seem to provide stable long-term results, with complications occurring primarily during the first 12 months postoperatively. In another study by Brock J W et al¹³ the reported complication rate was 16.6%.

The present study has certain limitation. The study population which is covered was not very large because it was a hospital based study and only those cases were taken for study who have reported to institution during study period. Similarly operative techniques were also not used in same number of patients which could affect the study results. In future similar study with large number of cases will be carried out including socio demographic and maternal factors.

Conclusions:

In this study cases of hypospadias, in the age group 0-14 years have been studied and this study concluded that maximum cases operated between 1-5 years of age. There was no significant difference in complication rates for various procedures regardless of the age of the patient at the time of operation. Majority of cases had severe degree of chordee. Associated congenital anomalies were seen in 22.22% cases. Most of the complications were associated with the Asopa III technique. Buccal mucosa as an onlay patch graft procedure showed the best result without any complications.

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