

Comparison of Dartos Island Flap Vs Corpus Spongiosum Tissue Covering Over Urethroplasty in Distal Penile Hypospadias

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Abstract: **Introduction:** Hypospadias is a congenital deformity characterized by an abnormally located urethral opening anywhere proximal to its normal location on the ventral surface of the penis or into the perineum. TIP procedure (Distal tubularized incised plate) is one of the most common surgical technique used worldwide for hypospadias repair. Urethrocutaneous fistula is most common reported surgical complication after hypospadias repair. The recurrence rate of fistula may be minimized by interposition of multiple well vascularised non-epithelialised layer such as redundant dartos tissue or scrotal based tunica vaginalis flap. The aim of our study was to compare the efficacy of a dartos pedicled flap coverage versus corpus spongiosum tissue covering in reduction of fistula rate after hypospadias surgery. **Material and Methods:** This prospective randomized study was conducted from Dec. 2018 to Dec. 2020 in all patients of distal and mid hypospadias who were admitted and operated in pediatric surgery unit and uro-surgery unit in the department of General Surgery, S. N. Medical College, Agra. The study was carried out on 50 patients of distal penile hypospadias. They were divided into 2 groups on random basis depending upon the type of operation performed to form the deficient urethral tube (25 patients in each). The results of the two groups were then compared in terms of complications and cosmetic outcome and analyzed statistically. **Discussion:** Based on our results and the review of literature, we suggest that the dorsal dartos flap covering should be used as an integral part of the Snodgrass procedure. A longitudinal, well-vascularized dartos flap, harvested dorsally and buttonholed ventrally, represents a good choice for preventing fistula over the corpus spongiosum covering only. **Conclusion:** Use of dartos flap to cover over with urethroplasty significantly reduces the fistula rate.

Keywords: dartos island flap, corpus spongiosum flap, distal penile hypospadias.

1. Introduction

Hypospadias is a congenital deformity characterized by an abnormally located urethral opening anywhere proximal to its normal location on the ventral surface of the penis or into the perineum. The classical triad of hypospadias is – Proximal urethral meatus, dorsally hooded foreskin and a ventral penile curvature arises from arrest in penile development, the latter two elements are not always present.⁽¹⁾ 5% of boys with hypospadias have intact prepuce. In addition to the triad of hypospadias additional anomalies can be seen including penile torsion, penoscrotal webbing and penoscrotal transposition. Reported incidence of hypospadias is 1 in 150-300 live births. The urethral meatus location has classically been used to define the severity of hypospadias. Using this criteria 70%-80% of children have distal hypospadias and 10%-25% of the children have proximal hypospadias.⁽²⁾ American Academy of Pediatric section in Urology recommended elective hypospadias repair occur between 6-24 months. Distal hypospadias repair can be broadly classified in two main categories- Advancement procedure and Tubularisation procedure. Among the repair outlined latter the survey of pediatric urologist identified the TIP technique was used more than 90% of times in distal hypospadias repair and 80% of the time in mid hypospadias repair. TIP procedure (Distal tubularized incised plate) is the modification of Thiersch/ Duplay repair.

One of the most common surgical technique used worldwide for hypospadias repair. In this technique midline incision of posterior urethral plate is designed to allow tubularisation of neo urethra. The TIP incision is deep and carried to the level just superficial to the corporal bodies. The urethroplasty must not be closed too far distally because this can increase the risk of meatal stenosis. In this procedure two parallel incision lateral to the urethral plate followed by a midline longitudinal incision to develop enough width for successful urethroplasty. Despite continued technical modifications and advances successful penile reconstruction of hypospadias remains a great challenge.

Complicating factor threatens to compromise even most meticulous repair. Urethrocutaneous fistula is most common reported surgical complication after hypospadias repair. The most common site is original urethral meatus or coronal margin. Development of fistula is multi factorial with ischemia, edema, infection, hematoma all contributing to improper healing of neo urethra. The recurrence rate of fistula may be minimized by interposition of multiple well vascularised non-epithelialised layer such as redundant dartos tissue or scrotal based tunica vaginalis flap.

2. Material and Methods

Research Setting

All patients of distal and mid hypospadias who will be admitted and operated in pediatric surgery unit and uro-

surgery unit in the department of General Surgery, S. N. Medical College, Agra.

comprised of 25 patients in whom corpus spongiosum tissue was used in urthroplasty.

Duration

The study was done between December 2018 to December 2020.

Sampling Units

Only males.

Elegibility Criteria

Inclusion criteria:

- Patients with coronal, sub coronal and distal penile hypospadias with minimal or no chordae to be included

Exclusion criteria:

- Patients with posterior hypospadias.
- Those with severe chordae are to be excluded.
- Patient with other associated genital anomaly.

Sample Size:

50 Patients

Study Design:

These patients shall be divided into 2 groups according to type of technique used:

Group A (sample Size-25): In these patients, hypospadias repair will be done with tubularised incised plate urethroplasty with Dorsal dartos pedicled flap.

Group B (sample Size-25): In these patients, hypospadias repair will be done with tubularised incised Plate urethroplasty using Corpus

Spongiosum tissue covering urethroplasty.

The data will be collected and statistics will be applied accordingly to assess the outcome.

Criteria on which result shall be assessed are:

- Age at Surgery
- Site and shape of meatus
- Size of catheter used for urethroplasty
- Urinary stream during voiding.
- Size of neourethra as calibrated by appropriate size well lubricated; infant feeding tube.
- Infection
- Fistula formation
- Cosmetic appearance
- Stricture formation

3. Observation

The present study was carried out in 50 patients of distal penile hypospadias admitted in S N Medical College, Agra. They were selected on random basis and were divided into two groups. They were studied from December 2018 to December 2020. Group A comprised of 25 patients in whom dorsal dartos island flap was used in urethroplasty. Group B

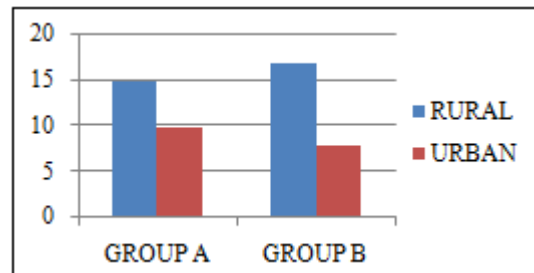


Table 1: Rural Urban Distribution

Age Group (Years)	Group A		Group B		Total	
	No.	%	No.	%	No.	%
Rural	15	60	17	68	32	64
Urban	10	40	8	32	18	56
Total	25	100	25	100	50	100

Table 2: Age Presentation

Age Group (Years)	Group A		Group B		Total	
	NO.	%	NO.	%	NO.	%
<4	4	16	2	8	6	12
4-6	8	32	9	36	17	34
>6	13	52	14	56	27	54
TOTAL	25	100	25	100	50	100
MEAN	6.32		7.14			

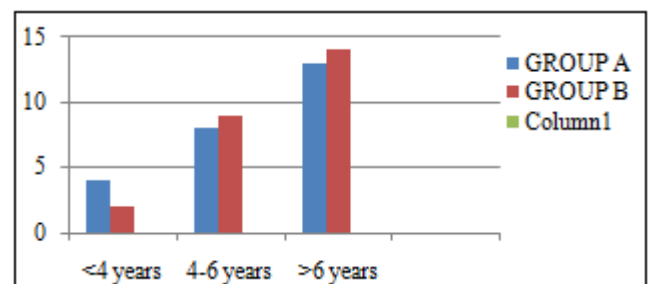
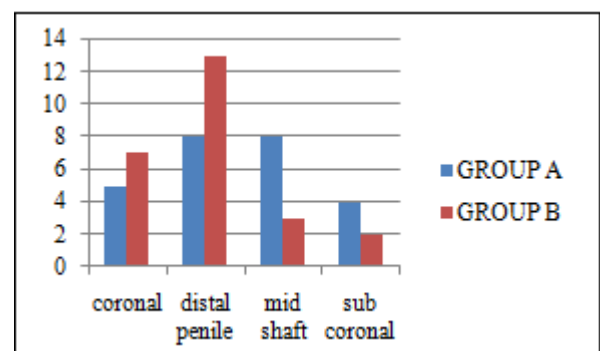


Table 3: Classification

Type	Group A		Group B		Total	
	NO.	%	NO.	%	NO.	%
Coronal	5	20	7	26	12	24
Sub Coronal	4	16	2	8	6	12
Distal Penile	8	32	13	52	21	42
Mid Shaft	8	32	3	12	11	22
	25	100	25	100	50	100



Classification

Table 4: Presenting Complaints

	Group A		Group B	
	No.	%	No.	%
Thin Stream	5	20	4	16
Cosmetic	25	100	25	100
Other Symptoms	0	0	0	0

Table 5: Initial Complications

Complication	Group A		Group B	
	No.	%	No.	%
Pericatheter Leak	3	12	5	20
Post Operative Oedema	2	8	4	14.29
Fistula	1	4	4	16
Diverticulum	0	0	1	4
Infection/ Wound Healing by Secondary Intention	1	4	4	17.14
Total	7	28	18	72

Table 6: Overall Complications

Complication	Group A (N=35)		Group B (N=35)	
	NO.	%	NO.	%
Fistula	1	4	6	24
Diverticulum	0	0	1	4
Infection	1	4	4	16
Meatal Stenosis	1	4	4	16
Proximal Stricture	0	0	2	8
Total	3	12	17	68

4. Discussion

Every new technique needs to be practiced and mastered over time. A comparison with the existing methods helps to prove the superiority of one technique over another. In this study, a new method of forming the deficient urethral tube distal penile hypospadias with using of dartos island flap. The two groups were not different statistically in age distribution. **Ghali A.M.A (1999)** analyzed the difference between the complication rates when the patients underwent repair when aged <2 years with those >2 years and did not find any significant difference statistically. Both groups had comparable distribution into rural and urban regions. **Duckett and Baskin (1996)** stated that the more distal the meatus, the more often it is associated with meatal stenosis. In our series also, majority of the patients with meatal stenosis had distal penile hypospadias (4/5).

Thus the penile length in patients with distal penile hypospadias without chordee or with minimal chordee is similar to that in normal subjects. In our study, there was no patient with associated micropenis. Snodgrass could reduce the fistula rate 0%.

T Esmael et al. (2010) reported to use of Dartos flap have 12% fistula formation. **Ghali AMA (1999)** had described an excellent result as a cosmetically and anatomically normal-looking penis able to direct a forceful urinary stream. A minor defect that would require no further management was considered a satisfactory outcome. 1 fistulae in group A closed spontaneously over 3 week with meatal calibration only. While in group B 2 patients (4%) spontaneous closure occur by meatal calibration, also 2 patients (4%) required operative treatment and 4 patients

(16%) required waiting for operation. All fistulas requiring operative treatment were corrected by local excision and layered closure of the fistulous tract. The number of overall complications was 4 in group A (out of 25, 16%) and 17 in group B (out of 25, 68%). On analyzing the difference between the overall complications between the 2 groups statistically.

5. Conclusion and Summary

- The results were compared in terms of complication rate and cosmesis.
- Most of the patients were between >6 years in age.
- The presenting complains were thin stream in 18% and cosmetic deformity in 100% taking all the 50 cases together.
- Majority of the patients were from rural background (64%)
- Cases of distal penile hypospadias 2 in group A and 4 in group B had meatal stenosis after operation.
- The mean penile length in 50 normal subject was 4.30±0.30 cm (range 3-8 cm)
- The mean duration of urethral catheter drainage was 8.5±1.4 days in group A and 8.1±1.54 days in group B.
- The most common complications noted were post operative oedema (2 cases in group A and 4 cases in group B) and fistula formation (1 cases in group A and 4 cases in group B). Diverticulum was seen in 2 case in group B and infection and healing by secondary intention was seen in 4 case in group B
- The cosmetic results were much better in group A with 60% cases having On comparing the difference between the two was significant.
- Mild meatal stenosis was seen in 1 patient in group A and 4 patients in group B. 2 patients in group B (8%) had proximal stricture formation
- 17 patients in group B (68%) required postoperative urethral dilatation 4 times or more while only 8 patients in group A (32%) required 4-5 times dilatation.
- 1 fistulae in group A closed spontaneously over 3 week with meatal calibration only. While in group B 2 (4%) patients required operative treatment and 2 patients spontaneous closure occur by meatal calibration only (4%).
- The overall complications seen in group A, 3 out of 25 (12%), were fistula in 4% and meatal stenosis in 4%. In group B the overall complications 19 (68%) were fistulae in 24%, diverticulum in 4%, meatal stenosis in 16% and proximal stricture formation in 8%
- Patient wise complications developed in 12% cases in group A and 68% cases in group B.
- Excellent results while in group B 32% cases had excellent cosmetic result.

References

- [1] Glenister, 1954; Kurzrock et al., 1999
- [2] Borer et al., 2001; Duckett, 1989; Pfistermuller et al., 2015; Rushton and Belman, 1998