

## A Comparative Study of Use of Bucks Fascia and Dartos Fascia to Reinforce Urethral Suture Line in Hypospadias Surgery

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### Abstract:

**Purpose:** Our purpose is to study the use of buck's fascia and dartos fascia to reinforce urethral suture line in hypospadias surgery to decrease the fistula rate and post op complications.

**Introduction:-** The most common congenital penile anomaly in children is hypospadias (68.%) followed by chordee (8.6.%) and hypospadias with chordee (5.%). Fistula and glans disruption are still the most frequent complications of hypospadias surgery. Neourethral coverage is a mandatory step in this challenging surgery; it reduces the rate of fistula. This coverage can be bucks fascia, dartos fascia & tunica vaginalis, Glue, etc. there is limited studies how compares dartos fascia with bucks fascia.

**Material and Method:-** Total 100 patients of 1 year to 14 year were studied which were divided in two study groups buck's fascia and dartos fascia group with 50 patients in each group. Hypospadias repair was performed in all patients and outcome was assessed immediate, 1 month, 3 month, and 6 months. post op complications were categorised as early and late.

**Result-** Most common age group at which children were operated were 1-3 age group. Cure rate of hypospadias surgery in our study was 79% and fistula rate was 21%. Most common type of hypospadias observed was sub-coronal. Other complications were pain, fever, haematuria, wound dehiscence, flap necrosis, blockage was found in clinically non-significant level. The rate of fistula was 26% in buck's fascia group and 16% in dartos group. P-value (0.216) for fistula rate in both groups is non-significant yet it can consider a clinically significant difference.

**Conclusion:-** We recommended to use of dartos fascia as vascularised intermediate layer to reinforce urethral suture line in hypospadias surgery. we see in buck's fascia as reinforcement is not good. this can be due to its difficult separation from its bed and thin and less vascular in distal areas of penis.

**Keywords:** Dartos flap, fistula, hypospadias, intermediate layer, spongiosum

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### I. Introduction

Hypospadias corrective surgery is challenging surgery in respect of complication and cosmetic correction. Despite the development of a number of techniques for hypospadias surgery, fistula and glans dehiscence are potential pitfall. After urethral repair a vascularised flap was placed above the suture line to reinforce it and prevent further complication. We describe a use of buck's fascia and dartos fascia as intermediate layer to reinforce urethral suture line in hypospadias surgery.

### II. Materials and Methods

This study done from December 2017 and March 2019, at MGMMC AND M.Y. HOSPITAL INDORE. Total 100 patients of 1 year to 14 year age were studied which were divided in two study groups bucks fascia and dartos fascia group with 50 patients in each group in random distribution fashion. Surgery were done according to anatomical requirement. Most of the patient were undergone snodgrass urethroplasty and outcome was assessed on immediate, 1 month, 3 month, and 6 months period. post op complications were categorised as early and late. Data was collected and master chart was prepared. Data was analysed statistically and clinically.

### III. Results

Out of total 100 patients 38 patient is in 1-3 years age group 20 in 0-1 years age group, 21 in 3-5 years age group and 21 in >5 years age group Patient is, mean age group of patients is 3.8, median 7 and mode is 2. In our series incidence of type of hypospadias is sub-coronal (21%) type followed by distal penile -19% mid penile -18%, penoscrotal -16% proximal penile -10%, glannuler-9% coronal -7%. Associated urogenital anomaly in our studied patient is right inguinal hernia, hydrocele, vesical calculous, undecadent testis. Cure rate of hypospadias surgery in our study was 79% and fistula rate was 21. Flap necrosis was seen in single patient in buck's fascia group. Wound dehiscence was noticed in 1 patient s dartos group and 3 patients in bucks fascia group. Urethro-cutaneous fistula developed in 8 out of 50 patients (16%) of Bucks fascia group and in 13 out of 50 patients (26%) of Dartos fascia group, which is clinically significant but statistically insignificant (p value 0.216).

### IV. Discussion

Hypospadias is one of the most commonly encountered congenital malformation of the genitourinary system.

The sources of complications include occlusion at the distal region of the new urethra, vascular distribution of the new urethral tissue, and postsurgical tissue infection. In addition, the location and shape of the original urethral opening, the surgical method used, and the experience of the surgeon are considered to play a role. For these various reasons, different forms of fistulas or fissures can occur anywhere in the junction of the new urethra or urethral plate. In particular, if infection occurs at the site of the wound, blood flow becomes insufficient, which can lead to necrosis. During the tissue repair process, urethra-cutaneous fistulas or fissures can form even more easily [5]. In cases of reoperation, the frequency of complications, including urethra-cutaneous fistulas, is much higher than in the primary operation. The main causes are believed to be the cicatrization of the urinary plate, health of the tissue, and decrease in blood flow [6].

In our study, we are comparing the effectiveness of use of vascularised intermediate layer that is bucks fascia and dartos fascia as reinforcement method for urethral suture line in hypospadias surgery. Flap continuity and vascularity were improved by accurately verify the junction of the skin and urethral mucosa, detaching the layers carefully, locating the margin differently at each layer, and suturing layer by layer.

Since urethro-cutaneous fistula is most influencing and determining complication which can be reduced by use of good vascular intermediate layer.

In our study complete success of hypospadias correction is seen in 79% of cases. in each study group this cure rate was 84% in dartos fascia group (of total 50 patients) and 74% in buck's fascia group (of total 50 patients). Which attributable to better outcome of dartos fascia as reinforcement method.

When observe fistula in respect to age of patient most of them were belonging to 1-3 year age group at the time of surgery. All age group shows non-significant difference ( $P > 0.05$ ) between proportion of fistula, except age group 3-5 Years which shows significantly higher proportion of fistula in Bucks group as compare to Dartos group ( $p < 0.05$ ). till recent time no study is available for occurrence of urethra-cutaneous fistula rate in different age group.

When observe fistula in respect to site of hypospadias we found that most common type of hypospadias found in our study is sub-coronal. most of the urethra-cutaneous fistula are found in distal type if hypospadias this is because separation of buck's fascia from its bed is more demanding and it is thin and less vascular in distal areas of penis. According to type of hypospadias there is no significant association in rate of fistula in each study group.

In dartos fascia group 8 out of 50 patients develop fistula and in buck's fascia group 13 out of 50 patients develop fistula. Fistula rate was high distal type of hypospadias and mostly 1-5 years age group. This may be due to most patients were included in this age group and since in distal type of hypospadias buck's fascia is thin and difficult to separate from its bed. P value of fistula rate in both groups is 0.216 which is statistically non-significant but Since fistula rate still higher in buck's fascia group it can consider at significant level clinically.

01 had flap necrosis and 4 patients develop urethral catheter blockage, 6 have haematuria, 3 have spraying, 4 patients develop wound dehiscence. On comparison in both study group we found that there is no significant difference statistically.

As we see in our study buck's fascia as reinforcement method is not good on comparing with dartos fascia.

Comparison with previous study which was done by baba et al, (10). In that study total 160 patient were studied which were belongs to 1 to 4.6 years age group. urethra-cutaneous fistula was seen 2 out of 80 patients in buck's fascia group and 10 out of 80 patients in dartos fascia group. P value of this study is 0.036 which significant and inference of that study is bucks fascia is good reinforcement method as compared to dartos fascia.

In our study complication rate was higher in buck's fascia group as compare to dartos fascia group. Early complication like pain, fever, bladder spasm, catheter blockage, haematuria was nearly in same frequency

in both groups. This is due to they are not related with use of reinforcement method. these were treated symptomatically. Late complications like flap necrosis, wound dehiscence, urethra-cutaneous fistula was seen in comparable difference in each study group.

On vast review of literature of hypospadias there is no other such studies was available which compare dartos fascia and buck's fascia.

On comparison in both study P-value for urethra-cutaneous fistula is 0.216. which indicate non-significant difference in both groups. although fistula rate higher in buck's fascia group in comparison to dartos fascia group.

On the basis of above observation and results we recommended to use of dartos fascia in comparison of buck's fascia as vascularised intermediate layer to reinforce urethral suture line in hypospadias surgery. Further study with more no of patient and more follow up needed to be done to take final conclusion.

### V. Conclusion

We recommended to use of dartos fascia as vascularised intermediate layer to reinforce urethral suture line in hypospadias surgery.

As we see in our study buck's fascia as reinforcement is not good. this can be due to its difficult separation from its bed. it is thin and less vascular in distal areas of penis which attributable to a greater number of fistula rate in distal type of hypospadias. While dartos fascia is easier to mobilise from its bed and had more efficient result and outcome in hypospadias surgery.

Early complication was occurred in same frequency in both groups. Complication rate was higher in buck's fascia used group as compared to dartos group in terms of late complication as urethra-cutaneous fistula formation, flap necrosis, wound dehiscence.+

### Summary

This prospective study consists on the outcome of different types of Fascia used to reinforce urethral suture line in hypospadias surgery. Total 100 paediatric patients aged 0-14 years admitted in routine hours in Paediatric Surgery unit of Surgery department of Maharaja Yashwantrao Hospital, Indore in duration of year December 2017 to march 2019. Most of the patients with Hypospadias were from rural areas. Sub-Coronal hypospadias is the most common hypospadias diagnosed in our study. other associated urogenital anomalies were right inguinal hernia, right sided hydrocele, & vesical calculus. Snodgrass urethroplasty was performed in most of the patient and outcome was assessed. Differential prospective study of outcome and result in two group was done. Complication rates were higher in BUCKS FASCIA group in terms of late complication as urethro-cutaneous fistula, spraying, flap necrosis & re-do surgery. Overall effectiveness of reinforcement method used in our study was determined and dartos fascia was seen as more effective measure to reduce the complication. we are recommending the use was dartos fascia as reinforcement method in hypospadias surgery.

**LIMITATION OF OUR STUDY:** - Despite taking all necessary precautions and a very rigorous methodology there are a few limitations to our study. Although seemingly large for a study of such design the sample size was still low and could have been increased with a longer study duration.

outcome of these study was depending on surgeon technique, type of hypospadias, age at which patient undergone surgery. personal hygiene patient family background, economic condition also influences outcome of study.

**FUTURE DIRECTION :-**In the view of our study outcome of bucks fascia in hypospadias is not better than dartos fascia group .here we are recommended to use dartos fascia as intermediate layer in hypospadias surgery and results of these intermediate layer was depends on type of hypospadias ,age of patient at which he was operated ,intra-op accurate separation of these flap .

This is not the final conclusion, further studies which will done in this topic in the future should include larger sample of population and longer duration of study and follow-up.

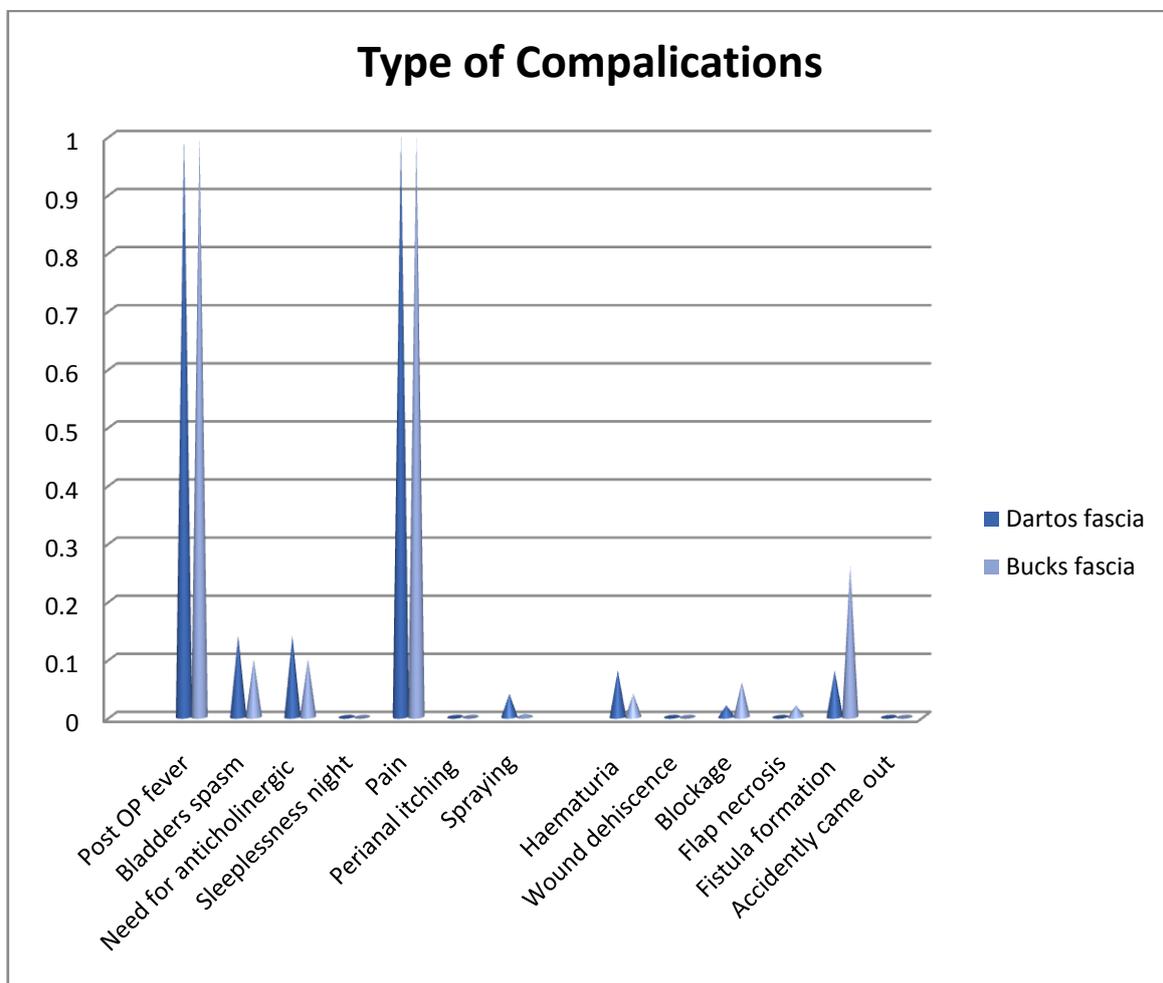
### ❖ STATISTICAL ANALYSIS, TABLES AND GRAPGH: -

**Table 1:** Complications of Group A (Dartos Fascia) and Group B (Bucks Fascia)

Complications	Group A (Dartos fascia)	%	Group B (bucks fascia)	%	P Value
	N = 50		N = 50		
Post OP fever	50	100%	50	100%	1.00 NSIG
Bladders spasm	7	14%	5	10%	0.537 NSIG
Need for anticholinergic	7	14%	5	10%	0.537 NSIG
Sleeplessness night	0	0	0	0	NA

Pain	50	100%	50	100%	1.00 NSIG
Perianal itching	0	0	0	0	NA
Spraying	2	4%	1	2%	0.557 NSIG
Haematuria	4	8%	2	4%	0.398 NSIG
Wound dehiscence	1	2%	3	6%	0.305 NSIG
Blockage	1	2%	3	6%	0.305 NSIG
Flap necrosis	0	0%	1	2%	0.312 NSIG
Fistula formation	8	16%	13	26%	0.216 NSIG
Accidently came out	0	0	0	0	NA

- ❖ In the above table we show the comparison of proportion of complication presence of different type in two groups.
- ❖ Two sample proportion test was applied to compare the proportions between two groups.
- ❖ All type of complication shows non significant difference (  $P > 0.05$  ) between proportion of present of complication in Bucks group and Dartos group.
- ❖ Both the groups are comparable on basis of complications and no statistical significant difference were observed for any complication.



**Table 2.** urethro- cutaneous fistula rate in each group

Study GROUP	Complication rate	p- value
Group A (Dartos fascia) Total = 50 cases	16% of the Dartos fasciaPatient	0.216 NSIG
Group B (Bucks fascia) Total =50 cases	26% of bucks fascia patients	

**Table 3**-total no of cases, distribution in each study group, age group, type of hypospadias and no of fistula developed

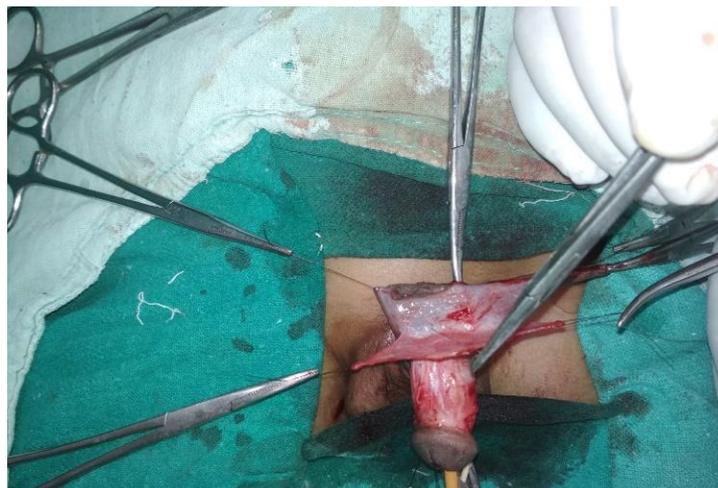
AGE	GROUP	GLANNULE R		CORONAL		SUB CORONAL		DISTAL P		MID P		PROXIMAL P		SCROTAL /PERINEAL/P S	
		CASE NO	FISTULA	CASE NO	FISTULA	CASE NO	FISTULA	CASE NO	FISTULA	CASE NO	FISTULA	CASE NO	FISTULA	CASE NO	FISTULA
0-1	A	1	0	1	0	1	0	1	0	1	0	4	1	1	0
	B	0	0	1	0	3	0	3	1	1	0	0	0	2	0
1-3	A	2	1	1	0	3	2	5	2	6	2	0	0	0	0
	B	0	0	1	0	5	1	3	0	6	3	2	0	4	3
3-5	A	0	0	1	0	2	0	2	0	0	0	2	0	2	0
	B	3	1	1	0	1	0	3	1	1	1	2	1	1	0
>5	A	2	0	1	0	3	0	1	0	1	0	0	0	5	0
	B	1	1	0	0	3	0	1	0	2	0	0	0	1	0

A- DARTOS  
B- BUCKS

FIGURES AND DIAGRAM: - photographs were taken during surgical repair.



**Figure 1** bucks fascia



**Figure 2** dartos fascia

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Nil.

**Conflicts of interest**

There are no conflicts of interest.

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