



OUTCOME OF TUNICA VAGINALIS FLAP AS SECOND LAYER COVER AFTER TUBULARISED INCISED PLATE TECHNIQUE FOR HYPOSPADIAS REPAIR

Urology

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ABSTRACT

Introduction: Hypospadias is a common congenital defect due to incomplete development of the urethra with a prevalence of 1:250 to 1:300 live births. In 1994, Snodgrass described Tubularized incised plate (TIP) urethroplasty for hypospadias repair. The aim of surgery for hypospadias is to reconstruct the penis that will be functionally and cosmetically as close to normal as possible. In this study we are evaluating the outcomes of the Tubularized incised plate method described by Snodgrass and to assess the advantages of covering the neourethra with a second layer cover using Tunica Vaginalis Flap especially in relation on preventing the fistula formation and other complications.

Aims and objectives: Aim of this study was to evaluate the role of tunica vaginalis flap as a second layer in hypospadias repair

Methods: This was a prospective observational study conducted at government general hospital, Guntur over a period of 2 years. A total of 34 patients were included in our study and all patients underwent TIPS procedure with tunica vaginalis flap as second layer cover. All patients were followed up till 6 months after surgery and observed for complications.

Results: Overall complication rate was 14% with fistula contributing to around 8.8% over a study period of 6 months with Tunica Vaginalis flap as second layer cover after Tubularized incised plate technique.

Conclusion: Results from this study indicate the excellent clinical outcomes with TIPS procedure in management of Hypospadias with acceptable complications rate.

KEYWORDS

Hypospadias, Tunica Vaginalis Flap, Tubularised Incised Plate, Fistula

INTRODUCTION:

Hypospadias is a common congenital defect due to incomplete development of the urethra with a prevalence of 1:250 to 1:300 live births.¹ It is manifested by an abnormal urethral opening occurring proximal to its normal location on the ventral surface of the penis or in the perineum. The prepuce is usually deficient ventrally forming a redundant dorsal hood over the glans. The skin on the ventral surface is thin and covers a broad band of fibrous tissue extending from the abnormal meatus to the glans. This band shortens the ventral aspect of the penis causing a curvature or chordee. Various surgeons have described many techniques of repair for hypospadias over last two centuries with different techniques being popular for a few years but none was considered standard method. Selecting an appropriate technique for a patient depends on various factors which include meatal location, appearance of meatus and glans, presence or absence of chordee, quality of ventral skin coverage, quality of the intact urethra and earlier attempts at repair. In 1994, Snodgrass described Tubularized incised plate (TIP) urethroplasty for distal penile hypospadias repair. Later it was also applied to proximal hypospadias, with good results. The aim of surgery for hypospadias is to reconstruct the penis that will be functionally and cosmetically as close to normal as possible. In this study we are evaluating the outcomes of the Tubularized incised plate method described by Snodgrass and to assess the advantages of covering the neourethra with a second layer cover using Tunica Vaginalis Flap especially in relation on preventing the fistula formation and other complications.^{2,3}

AIMS AND OBJECTIVES: Aim of this study was to evaluate the role of tunica vaginalis flap as a second layer in hypospadias repair and to assess the outcomes of hypospadias surgery at follow up with regards to complications.

METHODS: This was a prospective observational study conducted at government general hospital, Guntur over a period of 2 years from December 2016 to November 2018. Total of 34 patients with hypospadias were included in the study. Inclusion criteria were age > 6months, anterior hypospadias and redo hypospadias. Patients with Perineoscrotal hypospadias, bilateral undescended testes and intersex were excluded from the study. Preoperative surgical work up was done in all patients. All patients underwent Tubularized incised plate technique describes by Snodgrass followed by tunica vaginalis flap as a second layer cover. Postoperatively patients were followed up and

observed for complications at 1 week, 1 month, 3 months and 6 months.

RESULTS: A total of 34 patients were included in the study. The age of patients ranged from 2 years to 22 years. The average age at surgery was 6.52 ±3.82 years. Around 88% patients were <10 years of age. Most of the cases were primary cases which accounted for 76%. Rest of them were redo cases. Out of 8 patients who required redo surgery most common cause was fistula, of which 4 patients had distal penile, 2 patients had coronal and 1 patient had penoscrotal fistula. Other causes were stricture and complete breakdown. Most common site of meatus was distal penile in 24 patients followed by coronal and proximal penile. Total of 9 patients had congenital anomalies, of which 5 patients had undescended testes and 4 patients had inguinal hernia. A total of 8 patients had associated chordee, of which 6 patients had superficial chordee and 2 patients had deep chordee. Patients who had deep chordee required plication stitches. Average duration of hospital stay of our study population was 3.32 ±0.98 days. Most of the patients stayed for 3 to 4 days. During the first follow up visit, 5 patients had complications of which 4 patients had wound infection and 1 patient had superficial skin loss. During 2nd follow up visit at 1 month wound infection and superficial skin loss were the complications noted each accounted for one patient. During 3rd follow up visit 3 patients had complications, of which 2 patients had fistula and 1 patient had residual chordee. Wound infection and superficial skin loss which were present during the 1st and 2nd visit were healed. During 4th follow up visit at 6 months, fistula was seen in 3 patients and residual chordee and urethral diverticulum were seen in 1 patient each.

Table 1: Table showing over all complications during the entire study period of 6 months

Complications	1 week		1 month		3 months		6 months	
	No	%	no	%	No	%	no	%
Wound infection	4	11.7%	0	0	0	0	0	0
Superficial skin loss	1	2.9%	1	2.9%	0	0	0	0
Fistula	0	0	1	2.9%	2	5.8%	3	8.8%
Residual chordee	0	0	0	0	1	2.9%	1	2.9%
Urethral diverticulum	0	0	0	0	0	0	1	2.9%

DISCUSSION:

Hypospadias is a common congenital defect of male external genitalia presenting to the urological outpatient department. It is caused by incomplete fusion of urethral folds.

This study was conducted in Government General Hospital, Guntur over a period of 2 years to evaluate the role of tunica vaginalis flap as second layer in hypospadias repair. A total of 34 patients were included in our study. Most of the patients were primary cases which accounted for 76% and rest of the patients were redo cases. Various studies mentioned the cause for redo surgery is for fistula, which is true in our study too.^{4,5} Most common location of fistula in redo cases was distal penile which accounted for 50% followed by coronal and proximal penile.

A thorough evaluation of both urethral and penile malformations should be performed before surgery for the choice of best surgical treatment for hypospadias. In our study most common location of meatus was distal penile which constituted 71% followed by coronal, proximal penile and penoscrotal. Perineoscrotal hypospadias and bilateral cryptorchidism were excluded from our study. This was similar to other studies.^{4,6}

Several surgical procedures have been proposed for hypospadias repair to achieve normal appearing penis with low complication rates. Tubularized incised plate urethroplasty is one of the several established, successful methods of repairing anterior and mid hypospadias. It was initially described by Snodgrass in 1994 and this procedure has supplanted all other methods used in the past for correcting distal hypospadias.² The advantage of this technique is the excellent cosmetic appearance with minimum scarring in the urethra.

Follow up after surgery is very important to assess the functional, structural and cosmetic outcome of any type of repair for any type of hypospadias. In previous reported studies most of the complications were noted in the initial 6 months of follow up. In our study we followed up cases for 6 months postoperatively. The complications observed in our study were both early postoperative as well as late noted on follow up visits. During the first follow up visit, catheter was removed and stream of urine was observed and looked for occurrence of any complications.

During a study period of 6 months overall complication rate was 14 percent. These results were comparable to other national and international studies.

Various studies have reported various complications as follows:^{7,8}

Fistula formation	9% - 29%
Meatal stenosis	1.1% - 22.7%
Stricture formation	0% - 10%
Diverticula	0.6% - 4%
Flap necrosis	1% - 2%
Wound dehiscence	1.3% - 6%

Since introduction of Snodgrass urethral plate dorsal incision technique, results have been exceptionally good in primary as well as secondary repairs of hypospadias.

However urethrocutaneous fistula is common complication following Tubularized Incised Plate technique. To decrease the rate of this complication, a vascularised tissue can be applied as a second layer between the neourethra and the skin coverage. Furness and Hutcheson reported a success rate of 98% by using Dartos fascia as second layer cover of neourethra.⁹ However dartos fascia may not be always available to be used as a second layer hypospadias repair as in case of circumcised patients making it difficult to prepare dorsal based dartos flap. Tunica vaginalis is another tissue that can be used as a second layer in hypospadias repair. Advantages of this flap are its availability and excellent vascularity. This tissue is far from the penis and hence it is not affected by penile disorders and acceptable outcomes have been achieved from the used of tunica vaginalis flap for urethrocutaneous fistula. In a study conducted by snow it was found that success rate with tunica vaginalis flap was 100% without significant complications. Most of the complications were related to scrotal hematoma and abscess. Only 5% patients had urethrocutaneous fistula in his study¹⁰ whereas Tabassi et al⁶ reported fistula rate of 10.34% when tunica vaginalis flap was used as second layer in hypospadias repair. These results were similar to our study. Lower incidence of fistula rates by Snow and colleagues could be explained by use of microscopy by them.

Chatterjee et al¹¹ compared dartos flap and tunica vaginalis flap for hypospadias repair among 20 and 29 patients respectively and found fistula rates to be 20% and 10% respectively. In this study, for urinary

drainage either an indwelling urethral catheter alone or SPC were used, usually for a period of 5 – 14 days. Different studies have practiced bladder drainage from 0 – 10 days which was similar to our study. Suprapubic urinary diversion proximal to repair site for 4 – 11 days for secondary repair or fistula repair after hypospadias surgery was found beneficial in protecting the repair site.¹²

In redo cases previous use or preservation of urethral plate did not appear to influence the outcome of reoperation. Applicability and advantages of Tubularized incised plate urethroplasty for repeat hypospadias repair include local tissue with well-established vascularity for urethroplasty and skin coverage. Absent preputial skin in previously circumcised and repeat cases also makes Tubularized incised plate urethroplasty an ideal option as skin flaps are not necessary for urethroplasty or for penile shaft skin coverage since mobilized ventral penile shaft skin is usually sufficient.

Simple closure of fistula has more failure rates. Careful pre-surgical assessment of the patient, inversion of urethral mucosa, avoidance of any overlapping suture line and urinary diversion proximal to repair, usage of thin absorbable suture are the main criteria for satisfactory fistula repair. The success rates of these surgery usually improve with the use of Tunica Vaginalis as a second layer coverage of the neourethra in hypospadias surgery. Snow et al used tunica vaginalis flap to wrap the neourethra at the time of primary repair of hypospadias as well as in urethrocutaneous fistula repair for the first time.¹⁰ Since then many surgeons have used tunica vaginalis flap in repair of urethrocutaneous fistula with satisfactory results Thus repair of recurrent urethrocutaneous fistula with a tunica vaginalis flap is highly effective regardless of fistula location and number, type of initial hypospadias repair and number of previous closure attempts.

CONCLUSION:

Results from this study indicate the excellent clinical outcomes with TIPS procedure in management of Hypospadias with acceptable complications rate of 8.8% fistula rate and overall success rate of 85.4% comparable to the other quoted studies in literature.

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