



Obstetrics & Gynaecology

COMPARISON BETWEEN OUTCOME OF TUNICA VAGINALIS FLAP AND DARTOS FLAP FOR PRIMARY TIP URETHROPLASTY IN MID AND PROXIMAL PENILE HYOSPADIAS

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ABSTRACT **Aim:** To compare the outcome of Tunica vaginalis flap vs dartos flap for primary TIP urethroplasty in MID and PROXIMAL PENILE HYOSPADIAS. **Materials and Methods:** The patients, who were having mid & proximal penile hypospadias and were planned for tabularized incised plate urethroplasty were included in study. Tunica vaginalis flap or Inner prepuce dartos flap was used as 2nd layer in alternate patients **Results:** Three fistulas occurred in patients in whom IPD was used as 2nd layer which didn't close spontaneously **Conclusion:** In patients of mid & proximal hypospadias undergoing Snodgrass repair inner preputial dartos flap & tunica vaginalis flap as 2nd covering layer had no significant difference in fistula rate in our study

KEYWORDS : Dartos fascia, hypospadias, tunica vaginalis flap, urethrocutaneous fistula

Introduction:

The commonest complication of hypospadias surgery is fistula formation which usually requires re-operation. To prevent fistula formation several techniques of providing vascularized soft tissue cover to the neourethra have been described.

They include de-epithelialized skin^{1,2}, corpus spongiosum³, dartos fascia⁴, and tunica vaginalis. Both dartos fascia and tunica vaginalis^{5,7} provide robust cover to the urethra and act as a barrier between the suture lines. Dartos fascia, harvested from the dorsal inner prepuce, is more frequently used. Harvesting dartos fascia requires precise and skilful dissection to raise the dartos flap without damaging the intrinsic blood supply to the outer skin. If outer skin is devitalized because of over-enthusiastic effort to separate dartos, it may lead to skin necrosis and fistula formation.

Tunica vaginalis flap (TVF) has been used as an effective waterproofing layer in hypospadias. The tunica vaginalis flap (TVF) has sound vascularity, as it has a separate blood supply and does not depend on the vascularity of penile skin, unlike the dartos fascia.

The choice of waterproofing layer depends on surgeon. Only few studies have been performed to compare the outcome of these layers.

MATERIALS AND METHODS

The study was conducted in the department of general surgery, LLR & Associated Hospitals, GSVM Medical College, Kanpur from January 2019 to October 2020 on all patients of hypospadias who were admitted in surgery ward.

The study was conducted after approval from Ethical committee of GSVM medical college, Kanpur. Written informed consent was obtained from each participant. The clinical details of the patients were recorded according to the Proforma and questionnaire form were prepared before the commencement of the study.

- Criteria for selection of patients was based on –

Inclusion criteria-

Patients with mid and proximal penile hypospadias undergoing tubularized incised plate urethroplasty with either tunica vaginalis or inner preputial dartos flap as vascularized flap.

Exclusion criteria-

- For comparison group -
- Re do- surgery
- patient unfit for surgery

METHODS

- This prospective study was conducted on the patients admitted to

from January 2019 to October 2020 with hypospadias.

- Evaluation of these patients was done on the basis of patient characteristics –

- Name
- Age/Sex
- Phone number
- Sibling with age
- Birth weight
- Address

Comprehensive history –

Complaints

Age at the time of presenting to doctor at first time.

Examination findings

- Site of meatus
- Chordee : abnormal ventral curvature of penis
- Minimal (10-20%)
- Moderate (30 – 40%)
- Severe (>50%)
- Urethral plate
- Glans size
- Glans groove -cleft

-incomplete cleft

-Flat

Skin

Investigation

- CBC
- KFT
- RBS
- Serum electrolyte

USG KUB : ultrasonography would be done to exclude associated urinary tract anomalies.

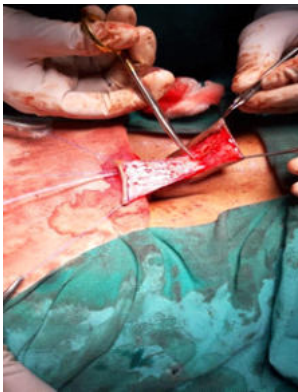
- These patients was taken for hypospadias repair by pediatric surgeons. The surgical procedure was decided by the operating surgeons.

- The patients, who are having mid & proximal penile hypospadias and are planned for tabularized incised plate urethroplasty with tunica vaginalis flap or inner preputial dartos layer as vascularized flap, would be taken for comparative study by Randomization. Randomization was done by taking alternate patient for Tunica vaginalis flap & Inner prepuce dartos flap in both mid & proximal penile hypospadias .

- The operative findings were noted in all patients.

Operative technique

Snodgrass :We performed Snodgrass TIP Urethroplasty with mobilization of a dorsal inner prepuceal dartos flap for neourethral covering. Briefly, a stay suture was placed at the dorsal skin of the glans for easy handling and then the urethral plate was outlined. A U-shaped incision was made, extending along the edges of the urethral plate from the tips of the glans to 2-3 mm on healthy skin proximal to the hypospadiac meatus. A circumferential incision 5-7 mm proximal to the coronal margin was extended from each edge of the urethral plate and the penile shaft was degloved. Artificial erection was performed to rule out chordee. A longitudinal relaxing incision was made at the midline from the distal extent of the urethral plate to the hypospadiac meatus, which widened the plate to approximately 13-16 mm. The urethral plate was then tubularised over a 6 or 8Fr infant feeding tube with a continuous 6-0 vicryl absorbable suture to create the neourethra that was extended upto around 5 mm proximal to the tip of the glans. Vascularised pedicled flap was elevated from inner surface of dorsal prepuce up to the base of penis and mobilised eventually over neourethra. It is an intermediate barrier layer between neourethra and surface skin layer.



Ectopic urethral meatus was calibrated with 6 or 8 Fr feeding tube after applying a stay suture at the glans. A sub-coronal circumferential incision was made extending ventrally in a 'U' shaped fashion around the ectopic meatus after applying a tourniquet. A midline shallow incision from ectopic meatus to the proposed new meatus was made on the urethral plate. The neourethra was constructed with 6-0 vicryl sutures over the indwelling catheter. The urethroplasty was fashioned using interrupted sutures with knots outside the lumen. Lateral edges of corpus spongiosum, when available, were approximated to cover the neourethra. The hemiscrotum was explored by retracting the degloved skin at the root of penis or making a separate incision on the scrotum. After layer by layer dissection of the scrotum, the tunica vaginalis was exposed and testis was delivered into the wound. A rectangular flap of tunica vaginalis was harvested with a vascular pedicle of adequate length so as to reach the site of insertion, that is, the neourethral tube through a tunnel beneath the penile skin.

The flap was spread over the neourethral tube and fixed with 6-0 vicryl. Glanuloplasty and meatal reconstruction was completed after adequate mobilisation of glanular flaps and achieving complete haemostasis using a low voltage bipolar diathermy. Skin cover was completed with 6-0 polyglactin interrupted sutures. Surgical wound of scrotum was closed with 5-0 vicryl interrupted sutures.

The redundant dorsal skin was transferred for resurfacing closure. Infant feeding tube secured to the glans penis and kept in situ for approximately 10 days, which served for drainage of urethral discharge. Dressing was changed on post-operative day 5.



Dressing would be opened on postoperative day 5, catheter would be removed on postoperative day 10

During hospitalization, patient were given IV antibiotics for 5 day then shifted to oral. Sedation was also given.

The catheter was removed on the 10th postoperative day & the patient was discharged oral antibiotics were continued for 5 more days. Patients were called for follow-up after two weeks calibration was done with infant feeding tube 6F or 8F & patients were advised for home calibration for period of 4 weeks.

- The postoperative outcome was assessed in terms of complications & cosmetic outcome.

Complication

early post op in 10 days-

- Bleeding and hematoma
- Edema
- Wound infection
- Wound dehiscence
- Skin necrosis
- Flap necrosis
- Penile torsion
- Penile erections
- Inadvertent removal of urethral stent
- Bladder spasms

Late assessed at 3 month-

- Glans dehiscence
- Urethrocutaneous fistula
- Residual chordee
- Meatal stenosis

Cosmetic outcome

- Conical glans
- Midline skin closure

Follow up

- 3 month to 1½ years

Statistical analysis

Descriptive statistics were employed to characterize the data. Chi-square test was used for categorical data. A P value of <0.05 was considered statistically significant.

Observation and results

comparison between tunica vaginalis flap and dartos flap as waterproofing layer (n=47)

(group A), repair using TVF for soft tissue cover as second layer. In (group B) repair using inner prepuceal dartos flap as 2nd layer for soft tissue cover.

	Tunica vaginalis flap group A	Inner prepuceal dartos flap Group B
Variety	Mid penile - 10 Proximal penile- 03	Mid penile - 05 Proximal penile - 29
Circumcised	No	No
Urethroplasty	Snodgrass	Snodgrass
Catheter related prob	02	00
Urethrocutaneous fistula	01	10
Glans dehiscence	02	08
Skin necrosis	00	02
Post op chordee	01	01
Meatal stenosis	00	05

chi-square test is applied for two group Yates correction is 0.0149. The p value is .05787. which is not significant (significance p<.05)

N=47 because comparison between tunica vaginalis flap and dartos flap in mid and proximal hypospadias 2nd layer used in 47 patient using snodgrass urethroplasty techniques.

All the patients in groups A and B were similar in their demography. The type of hypospadias varied from , mid-penile, and proximal hypospadias in similar distribution in both the groups. 13 patients in

group A and 34 patients in group B had chordee on examination. Detailed distribution is shown in Table. In both the groups, only those patients were selected for comparison group where a tubularized incised plate (TIP) repair (with or without graft in the dorsal raw area caused by the incision in the urethral plate) was possible. Cases with onlay flap repair, redo cases and previous inguino-scrotal surgery were excluded. The results are summarized in Table. The type of hypospadias in group A was mid-penile in 10, and proximal in 03. no circumcision done elsewhere prior to being referred to us for hypospadias repair. one cases required TIP + graft procedure, while the rest 34 were managed by TIP procedure. All had successful repair. two patient developed superficial wound dehiscence, which was managed conservatively. one patient in the group had fistula .one patient had residual chordae .no patient had meatal stenosis.

In Group B patients 2nd layer was from IPD flap . 5 had mid-penile and 29 had proximal penile hypospadias. TIP was done in 34 patients and the rest no cases required TIP + graft procedure. 10 patients developed fistula at corona, requiring a delayed closure. two patients developed localized superficial necrosis of the ventral penile skin, which healed without sequel. 5 patient had meatal stenosis. The chi square statistic with yate correction 0.4387. p value .0578765. not significant at p<.05 for meatal stenosis.

For Harvesting TVF the ventral penile incision was continued posteriorly along the midline raphe which gave good access to the testis. Although this endeavor took some extra time, this gradually decreased as we climbed the learning curve. The mean duration of operation was 87 min (range: 75-115 min). which was more than Group B with 102.80±4.58 minutes (range: 95- 115 minutes) The trend showing decrease in the operating time as the study progressed.

Discussion:

In our study, 11 cases TVF as 2nd covering layer of mid and proximal hypospadias patients have long suture line from long urethroplasty had posterior hypospadias . Despite this, two leak or fistula (18.18%) occurred . Using dartos in mid & proximal hypospadias may result in shortage of skin or skin necrosis from damage to the intrinsic blood supply to the outer skin. Since vascularity of TVF does not depend on the skin, the ventral skin cover is never compromised.^{9,10}

Three fistulas occurred in patients in whom IPD was used as 2nd layer which didn't close spontaneously .

When chi-square test is applied for two group Yates correction is 0.0149. The p value is .902799. which is not significant (significance p<.05)

.. Snow *et al.*, in 1995, were the first to report the use of tunica vaginalis as interposition graft. The fistula rate reported was 9%. Similar results have also been reported by Shankar *et al.* and Handoo. It is a dependable soft tissue cover for redo cases and posterior hypospadias surgery.¹¹

in an article comparing these two methods of soft tissue cover. Chatterjee US *et al.*³ have prospectively compared the two techniques of neourethral coverage after a TIP procedure. They have concluded that TIP with TVF could be an alternative to other techniques in a primary case of hypospadias. However, it was a multi-institutional study inviting surgeon variations. In their study, the fistula rate for cases with TVF and dartos flap were 0% and 15-20%, respectively. Our fistula rate for dartos flap is 30% which is in tune with other reported series. More importantly, we have seen one cases of superficial skin necrosis following dartos flap. Although it healed well in the long run, it did cause anxiety and distress to the families and invited more hospital visits. Hence, we consider that dartos flap had significant morbidity because of this inconsequential complication.

Total breakdown of repair is also known after this operation. In our study no breakdown occur.

Chatterjee's US *et al* study has used only TIP repair in all the cases. We selected cases on the basis correction of chordee without deviding the plate and urethral plate. In some cases, poor projection of the urethral plate on the glans has required additional grafting.⁸

In our study patients of mid & proximal hypospadias undergoing Snodgrass repara inner preputial dartos flap & tunica vaginalis flap as

2nd covering layer had no significant difference in fistula rate. Dhua *et al.*¹². in a comparison study did not show a statistical difference in fistula rate after comparing the dartos flap to a tunica vaginalis flap though the tunica vaginalis flap was slightly better. Safwat *et al.*¹³ showed in a comparison study that a double flap gave fewer complications as compared with a single flap

CONCLUSION:

In patients of mid & proximal hypospadias undergoing Snodgrass repara inner preputial dartos flap & tunica vaginalis flap as 2nd covering layer had no significant difference in fistula rate.

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