



Tunica Vaginalis Flap Repair for Recurrent Urethrocutaneous Fistulae Following Hypospadias Surgery

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ABSTRACT

There are many techniques in Hypospadias surgery. The tubularized incised plate repair is currently the most widely used technique. The most significant and frequent complication is formation of one or more urethrocutaneous fistula. Tunneled tunica vaginalis flap (TVF) is a well-described technique for the repair of UCF. We retrospectively reviewed all of our patients underwent repair of UCF from 2008 to 2014. 28 boys underwent TVF repair at our institution for UCF. Fistulae ranged from distal penile to penoscrotal junction in location. Median surgical time was 45 minutes and no postoperative complications occurred. After a median follow-up of 67 months (range 24–118 months), no patient had a recurrence of UCF. So, according to our study, TVF repair is very successful in the treatment of UCF after a failed hypospadias repair. TVF is technically simple to perform and should be considered for treating UCF following Hypospadias surgery especially in a repeat surgery.

KEYWORDS :

1. Introduction

Hypospadias has been a well recognized surgically treatable condition among young boys. surgical techniques of hypospadias have evolved with time. The most significant advance in this occurred in 1994 with Snodgrass' description of the tubularized incised plate (TIP) urethroplasty technique[1]. Since its initial description in cases of distal hypospadias, TIP urethroplasty has now been applied with good success rate in both proximal and re-do hypospadias.

Despite these advances in urethroplasty techniques, some complications remain problematic even now, like, meatal stenosis, urethral stricture or diverticulum, wound dehiscence, and, most importantly, urethrocutaneous fistulae (UCF). A recent review of TIP urethroplasty reveals a combined UCF rate of 2.4% across several centers [2]. The interposition of vascularized tissue such as tunica vaginalis flap or deepithelialized dartos tissue has been suggested as an effective means of reducing UCF formation rate in multiple urethroplasty techniques, including TIP [2-4].

A Successful fistula repair depends upon meticulous attention to the surgical technique, as well as the use of interposed tissue. In reoperative patients, it is difficult to get this well vascularized tissue locally. One possibility for interposition graft for UCF repair is the use of tunneled TVF, which was first described in 1970 by Hosli [5] and subsequently popularized by Snow et al. [3]

2. Materials and methods

a. Patient selection

We retrospectively reviewed the records of patients underwent TVF repair for Urethrocutaneous fistula following failed hypospadias surgery in our institution between March 2008 and May 2014. All the prior surgeries were done from elsewhere. other institutions. Patients who had failed previous UCF repair as well as fresh UCF were included in this study. All final UCF repairs were performed in this institution. Surgeries were performed under general anesthesia or spinal anesthesia depending on the age of the patient. Minimum six month healing period was kept between the previous penile surgery and UCF repair. For each patient, the following data were collected: age, number of previous surgeries, number and location of fistulae, surgical/anesthetic duration, length of follow up, and postoperative complications. The complications considered are meatal stenosis, postoperative wound infection, scrotal hematoma, penile torque, penile tethering, or recurrence of fistulae.

b. Surgical Technique

All patients should undergo calibration of the distal urethra. Dilute Betadine solution is instilled into the urethra through the meatus to confirm the exact location and number of fistulae. A Silicone catheter of appropriate size is placed in the bladder. Each fistula tract is excised, and the urethra is primarily closed in two layers using 5-0 Polyglactin suture. Then a 1-2 cm incision is then made at the level of the root of the scrotum. A flap of tunica vaginalis is harvested then. The length of flap is determined by the distance from the harvest site to the fistula. The flap is then tunneled under the penile skin and brought out through the most distal UCF tract. The TVF is then fixed at each UCF site using 5-0 Polyglactin. The skin overlying each UCF tract is then closed.

3. Results

Twenty eight boys (mean age 13.5 years) underwent TVF repair of recurrent UCF at our institution during the study period. 4 (14%) boys had distal shaft and 16 (57.5%) had mid-shaft and 8 (28.5%) had penoscrotal urethrocutaneous fistulae. Eight (28.5%) boys had multiple fistulae (more than one) and the remaining 20 (71.5%) had single fistula. All patients had originally undergone TIP repair from elsewhere. All the fistulae were developed spontaneously within the first six months of the initial TIP repair.

18 (64%) undergoing their first repair, 8 (28.5%) undergoing second repairs, and 2 (7.5%) undergoing third repairs

Median operative time was 43 minutes (range 35–55).

No postoperative complications have occurred in any patient, including hematoma, wound infection, abscess, or secondary chordee or torque. After a mean follow up of 67 months (range 24–118 months), no patient had a recurrence of UCF.

4. Discussion

TIP urethroplasty is increasingly utilized since its introduction by Snodgrass in 1994 [1]. However, the procedure is not without potential complications, including meatal stenosis, urethral stricture or diverticulum, wound dehiscence, and UCF. In a recent review, a UCF rate of 2.4% was noted [2]. Several reports, however, show a much higher fistula rate, including those of Chatterjee et al. (15%) [8], Amukele et al. (17%) [9], and Guralnick et al. (16%) [10].

Snow et al. have advocated the use of TVF during primary hypospadias repair. When combined with use of the operative

microscope, their reported posturethroplasty UCF rate is 0%.The utilization of TVF has also been described as a means of UCF repair following initial urethroplasty using several techniques, with a combined recurrence rate of 7.9% and no complications reported [11-15]. Pattaras and Rushton have reported two patients who developed severe penile torque several years after primary urethroplasty using TVF . In both cases the flap was simply divided with subsequent resolution of the torque [16].

There are plenty of advantages for TVF, especially in the re-operative patient. The tunica lies well away from the operative field of the penile shaft; its blood supply remains uninterrupted even in the setting of numerous reoperations. Access to tunica vaginalis is technically simple, and there is not much increase in operative time. The complication rate is also very low in all the reports[15,16,17]. Altogether this proves to be a safer and easier procedure to perform, even in the setting of a re-operative patient with multiple fistulae.

5. Conclusions

Tunneled TVF repair is a highly successful technique for the treatment of Urethrocutaneous fistula following failed hypospadias repair. The technique is simple and easy to perform with not much complications in our experience. TVF repair is particularly useful as the tissue of choice for treating UCF in the repeat surgical setting, with excellent results at long-term follow up.

6. References

1. W. Snodgrass, "Tubularized, incised plate urethroplasty for distal hypospadias," *The Journal of Urology*, vol. 151, no. 2, pp. 464–465, 1994. View at Google Scholar
2. W. T. Snodgrass, "Tubularized incised plate hypospadias repair: indications, technique, and complications," *Urology*, vol. 54, no. 1, pp. 6–11, 1999. View at Publisher · View at Google Scholar
3. B. W. Snow, P. C. Cartwright, and K. Unger, "Tunica vaginalis blanket wrap to prevent urethrocutaneous fistula: an 8-year experience," *The Journal of Urology*, vol. 153, no. 2, pp. 472–473, 1995. View at Publisher · View at Google Scholar
4. B. W. Snow, "Use of tunica vaginalis to prevent fistulas in hypospadias surgery," *The Journal of Urology*, vol. 136, no. 4, pp. 861–863, 1986. View at Google Scholar
5. P. O. Hosli, "Eine technik zum verschluss von harnrohrenfistein," *Urologe*, vol. 9, p. 129, 1970. View at Google Scholar
6. J. C. Routh, J. J. Wolpert, and Y. Reinberg, "Tunneled tunica vaginalis flap is an effective technique for recurrent urethrocutaneous fistulas following tubularized incised plate urethroplasty," *The Journal of Urology*, vol. 176, no. 4, pp. 1578–1581, 2006. View at Publisher · View at Google Scholar
7. R. E. Steckler and M. R. Zaontz, "Stent-free Thiersch-Duplay hypospadias repair with the Snodgrass modification," *The Journal of Urology*, vol. 158, no. 3, pp. 1178–1180, 1997. View at Publisher · View at Google Scholar
8. U. S. Chatterjee, M. K. Mandal, S. Basu, R. Das, and T. Majhi, "Comparative study of dartos fascia and tunica vaginalis pedicle wrap for the tubularized incised plate in primary hypospadias repair," *BJU International*, vol. 94, no. 7, pp. 1102–1104, 2004. View at Publisher · View at Google Scholar
9. S. A. Amukele, J. A. Stock, and M. K. Hanna, "Management and outcome of complex hypospadias repairs," *The Journal of Urology*, vol. 174, no. 4, part 2, pp. 1540–1543, 2005. View at Publisher · View at Google Scholar
10. M. L. Guralnick, A. al-Shammari, P. E. Williot, and M. P. Leonard, "Outcome of hypospadias repair using the tubularized, incised plate urethroplasty," *The Canadian Journal of Urology*, vol. 7, no. 2, pp. 986–991, 2000. View at Google Scholar
11. E. H. Landau, O. N. Gofrit, S. Meretyk et al., "Outcome analysis of tunica vaginalis flap for the correction of recurrent urethrocutaneous fistula in children," *The Journal of Urology*, vol. 170, no. 4, part 2, pp. 1596–1599, 2003. View at Publisher · View at Google Scholar
12. Z. Kirkali, "Tunica vaginalis: an aid in hypospadias surgery," *British Journal of Urology*, vol. 65, no. 5, pp. 530–532, 1990. View at Google Scholar
13. R. B. Singh and N. M. Pavithran, "Tunica vaginalis interposition flap in the closure of massive disruption of the neourethral tube (macro urethrocutaneous fistulae)," *Pediatric Surgery International*, vol. 20, no. 6, pp. 464–466, 2004. View at Publisher · View at Google Scholar
14. K. R. Shankar, P. D. Losty, M. Hopper, L. Wong, and A. M. K. Rickwood, "Outcome of hypospadias fistula repair," *BJU International*, vol. 89, no. 1, pp. 103–105, 2002. View at Publisher · View at Google Scholar
15. G. E. Voges, H. Riedmiller, and R. Hohenfellner, "Tunica vaginalis free grafts for closure of urethrocutaneous fistulas," *Urologia Internationalis*, vol. 45, no. 2, pp. 88–91, 1990. View at Google Scholar
16. J. G. Pattaras and H. G. Rushton, "Penile torque after the use of tunica vaginalis blanket wrap as an aid in hypospadias repair," *The Journal of Urology*, vol. 161, no. 3, pp. 934–935, 1999. View at Publisher · View at Google Scholar
17. "Tunneled Tunica Vaginalis Flap for Recurrent Urethrocutaneous Fistulae". *Advances in Urology*, Volume 2008 (2008), Article ID 615928, 3 pages, Jonathan C. Routh, 1 James J. Wolpert, 2 and Yuri Reinberg 2