

Transurethral Inlay Vaginal Graft Urethroplasty for Female Urethral Stricture

Naomi Constantia Allen*, Parsaoran Nababan, Raden Dadan Mochamad Ramadhan, Fedry Yance

Department of Urology, Dr.
Soedarso General Hospital,
Pontianak, Indonesia

***Corresponding Author**

Naomi Constantia Allen
Jl. DR. Soedarso No.1, Bangka
Belitung Laut, Kec. Pontianak
Tenggara, Kota Pontianak,
Kalimantan Barat 78124
Email:
naomiconstantia@gmail.com

Introduction. Female urethral stricture is rare. Treatment option includes urethroplasty with various techniques, but no single approach has been demonstrated to be the best. One major issue has been the risk of post operative incontinence.

Case. We present our experience of the management of female urethral stricture with transurethral inlay vaginal graft urethroplasty. A 51 year old female patient presented with urinary retention and foley insertion failed. Urethroscopy showed panstricture of the urethra and transurethral inlay urethroplasty was performed using vaginal graft. The patient showed improvement of the symptoms postoperatively.

Conclusion. Transurethral inlay urethroplasty is a feasible option for the management of female urethral stricture to reduce the risk of post op incontinence because it doesn't require high urethral mobilization.

Keywords: female urethral stricture, transurethral inlay, incontinence

Introduction

Female urethral stricture is a rare condition with an estimated prevalence of 4%–13% in women with bladder outlet obstruction, which affects 3–8% of women [1]. It may be due to idiopathic, iatrogenic, traumatic, inflammatory, or malignant etiology [2]. Diagnosing female urethral stricture is challenging because of the non-specific presenting symptoms, lack of consensus on a definition, and different diagnostic tools. There hasn't been a standardized management strategy for female urethral stricture [3].

Treatment options include urethroplasty, associated with a high success rate compared to urethral dilation or internal urethrotomy. But no single approach has been demonstrated to be the best. One major issue has been the risk of post-operative incontinence. The inlay procedure reduces this risk, as the procedure is performed intraurethrally and does not require high urethral mobilization [4]. To the best of our knowledge, we are the first to report the reconstruction of female urethral stricture by transurethral inlay urethroplasty using a vaginal graft.

Case Report

A 51-year-old female patient presented with urinary retention. Foley insertion failed, and a cystostomy was performed. There was no history of trauma or prior surgical procedures, only severe lower urinary tract symptoms. Retrograde urethrography and voiding cystourethrography were not done because of the minimal armamentarium. Female urethral stricture was made as a diagnosis, and urethroscopy confirmed the panstricture of the urethra with a normal bladder neck. A direct visual internal urethrotomy (DVIU) was primarily done from the distal to proximal urethra. The urethra was then dilated, and a nasal speculum was placed. A ventral urethrotomy was carried out secondarily at 6 o'clock position. A 6 x 2 cm vaginal graft was harvested from the right lateral vaginal wall, and a transurethral inlay technique was performed to place the graft from the proximal bladder neck to the urethral meatus. Graft was sutured into place by three simple interrupted sutures at 5, 6, and 7 o'clock. Stitches at the vestibulum and lateral sides were done. Foley catheter was left in place for 1 month. To date, after 2 months of follow up, the patient is voiding well, with no urinary continence.

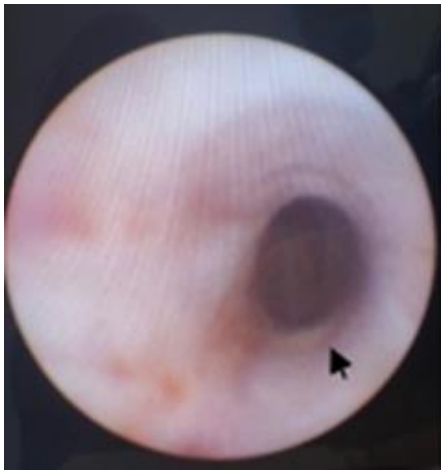


Figure 1. Urethroscopy showed the area of panstricture

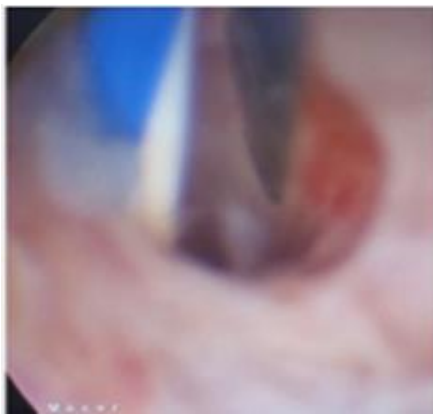


Figure 2. Direct Visual Internal Urethrotomy (DVIU) from distal to proximal urethra

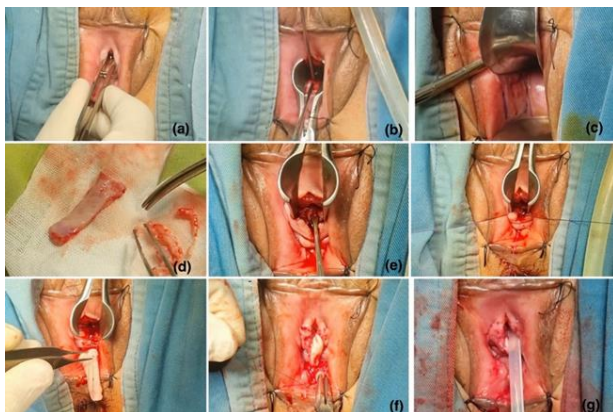


Figure 3. (a) Urethral dilation (b) Ventral urethrotomy at 6 o'clock position (c) Marking the area of graft harvesting (d) 6x2cm vaginal graft (e) Vaginal graft inserted as inlay from the proximal bladder neck to the urethral meatus, and was sutured into place at 5, 6 and 7 o'clock. (f) Stitches at the vestibulum and lateral sides were done. (g) Foley was left in place for a month.

Discussion

Due to its rarity, there isn't a standardized management strategy for female urethral stricture. No significant case series exist, and no one technique has been shown to be the most effective. One major issue on female urethroplasty has been the risk of post operative incontinence. It might come from injury to the urethral sphincter mechanism and support.

The female urethra approach can be divided in two types: intralumen and extralumen [4]. The term "transurethral inlay" refers to a graft that is applied endoluminally through the urethra, cutting only the fibrotic tissue and urethral mucosa below, without opening the urethra completely or forming a plane between the urethra and vagina [5]. Hoag et al. were the first who described this intraurethral procedure in 2016, [6] referring to it as a vaginal sparing approach, then subsequently by Nayak et al. reported case series [5].

The inlay approach reduces the post operative incontinence scientifically, as it is performed intraurethrally and requires minimal urethral mobilization. The inlay approach has the following benefits: 1) it prevents dorsal urethral mobilization, which can lessen postoperative pain; 2) it prevents dissection and potential disruption of the clitoris' nerve and vascular supply, which can lessen blood loss and postoperative sexual dysfunction; and 3) avoiding a vaginal incision, which can lessen the chance of developing a urethrovaginal or vesicovaginal fistula; 4) avoiding anterior vaginal wall dissection, which protects this tissue for potential future anti-incontinence procedures; and 5) avoiding pubourethral ligament division [5-7]

Vaginal, labial, buccal, or lingual mucosa are utilized in graft repairs. Hairless, elastic, wet tissue with a good vascular supply is found in both vaginal and labial tissue. Minimal scar formation and healing is facilitated by their close proximity to the recipient site [7]. Vaginal wall was harvested as a graft in this case because of the patient's readily accessible local tissue, and the surgeon's preference to avoid complications that may occur with oral graft harvesting. However it relies on healthy surrounding tissues and might not be available if those tissues are damaged or atrophic [8,9]

The limitation of this study is it needs longer follow up and larger sample size. The absence of objective measurement of the outcome such as uroflowmetry and a post void residual (PVR) test is also a weak point of this study. Although up to this point it is evident that no specific technique has shown itself to be better in the literature, the

transurethral inlay technique has proven advantageous [5].

Conclusion

A transurethral inlay urethroplasty is a feasible option for the management of female urethral stricture to reduce the risk of incontinence.

References

- [1] Higgins MM, Wengryn D, Koslov D, Oliver J, Flynn BJ. Female urethroplasty with dorsal onlay buccal mucosal graft: a single institution experience. *Int Urol Nephrol*. 2023 May;55(5):1149–1154. Available from: <https://pubmed.ncbi.nlm.nih.gov/36859624/> DOI: 10.1007/s11255-023-03520-5
- [2] Tao C, Jin X, Zhang H. Dorsal oral mucosa graft urethroplasty for female urethral stricture reconstruction: a narrative review. *Front Surg*. 2023 Mar 21;10: 1146429. Available from: <https://pubmed.ncbi.nlm.nih.gov/37025264/> DOI: 10.3389/fsurg.2023.1146429
- [3] Emami M, Shadpour P, Kamali K, Narimani N, Hosseini J. Female anterior wall onlay urethroplasty with lower lip buccal mucosal graft: Importance of the laterally extended incision. *Asian J Urol*. 2023 Jan;10(1);33-38. Available from: <https://pubmed.ncbi.nlm.nih.gov/36721702/> DOI: 10.1016/j.ajur.2022.04.002.
- [4] Joshi PM, Kulkarni SB. A new technique of double-face buccal graft urethroplasty for female urethral strictures. *Turk J Urol*. 2019 Nov 29;46(2):165-168. Available from: <https://pubmed.ncbi.nlm.nih.gov/32125968/> DOI: 10.5152/tud.2019.19228
- [5] Nayak P, Mandal S, Das M. Ventral-inlay buccal mucosal graft urethroplasty for female urethral stricture. *Indian J Urol*. 2019 Oct-Dec; 35(4): 273–277. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6792411/> DOI: 10.4103/iju.IJU_57_19
- [6] Hoag N, Gani J, Chee J. Vaginal-sparing ventral buccal mucosal graft urethroplasty for female urethral stricture: a novel modification of surgical technique. *Investig Clin Urol*. 2016 Jul; 57(4): 298–302. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4949696/> DOI: 10.4111/icu.2016.57.4.298
- [7] Chua KJ et al. Treatment of Urethral Stricture Disease in Women: Nonsystematic Review of Surgical Techniques and Intraoperative Considerations. *Res Rep Urol*. 2021 Jun 21; 13:381–406. Available from: <https://pubmed.ncbi.nlm.nih.gov/34189132/> DOI: 10.2147/RRU.S282651.
- [8] Hoag N, Chee J. Surgical management of female urethral strictures. *Transl Androl Urol*. 2017;6(Suppl 2):76-80. Available from: <https://pubmed.ncbi.nlm.nih.gov/28791225/> DOI: <https://pubmed.ncbi.nlm.nih.gov/28791225/>
- [9] Osman NI, Mangera A, Chapple CR. A systematic review of surgical techniques used in the treatment of female urethral stricture. *Eur Urol*. 2013 Dec;64(6): 965–973. Available from: <https://pubmed.ncbi.nlm.nih.gov/23937829/> DOI: 10.1016/j.eururo.2013.07.038