

## CASE REPORT

# Combined Dorsal and Ventral Inlay Buccal Mucosal Graft Urethroplasty for Female Urethral Strictures (Joshi Urethroplasty Technique): A First in the Philippines

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Urethral strictures in females are very uncommon. In selected populations of women who underwent urodynamic studies for obstructive symptoms, female urethral strictures represent 4-13% of the causes of bladder outlet obstruction. Literature is limited regarding surgical treatment for near-oblitative urethral strictures in female patients. In this paper, the authors aimed to report a novel technique of double-faced inlay buccal mucosal graft (BMG) urethroplasty, first described by Joshi in 2020. This is a case of a 35-year-old female with progressively worsening lower urinary tract symptoms, several months after undergoing cesarean section despite multiple internal urethrotomies. Grafts were placed both the anterior and posterior urethral walls with noted good urine flow with mild lower urinary tract symptoms on follow-up after 6 months. The combined dorsal and ventral inlay BMG urethroplasty is a feasible technique with good results for female patients with urethral strictures. To the authors' knowledge, this is the first-ever reported case, for this novel technique, in the Philippines.

**Key words:** Ventral inlay buccal mucosal graft urethroplasty, urethral strictures

### Introduction

The worldwide literature regarding the incidence of female urethral strictures may be under-reported because majority of cases are conveniently treated by urethral dilation or internal urethrotomy.<sup>1,2</sup> Urethroplasty for female strictures have been previously described: Dorsal onlay, ventral onlay, and ventral inlay with varying success and complication rates.<sup>1-5</sup> Of these, the risk of incontinence is lowest with the ventral inlay technique as it does not require dissection outside of the urethra where the sphincter could be damaged.

Treatment of male urethral strictures usually take into consideration whether the stricture is obliterative or non-oblitative. For obliterative

strictures, a double-faced BMG urethroplasty is usually employed but this technique has never been used for female urethral strictures. The Joshi Technique was initially described in 2020 (Joshi, et al. 2020) and to the authors' knowledge, this is the first ever report in the Philippines using this technique.

### The Case

Patient is a 35-year-old female who presented with progressively worsening lower urinary tract symptoms, 3 months after undergoing cesarean section. She was diagnosed with a urethral stricture by cystoscopy and eventually underwent internal urethrotomy twice. She was also instructed

to perform intermittent self catheterization. Persistence of symptoms prompted consult at this institution for further management.

The authors performed the following diagnostic tools: flexible urethroscopy, voiding cystourethrography, and uroflowmetry. Flexible urethroscopy revealed a near obliterated lumen with severe fibrosis with noted narrowing 1cm from the meatal opening and 1cm distal to do the bladder neck (Figure 1A). Voiding cystourethrogram showed narrowed lumen at the level of the

proximal and distal urethra as evidenced by abrupt tapering 1cm distal to the bladder neck (Figure 1B). Uroflowmetry showed obstructive pattern with a Qmax of 6ml/sec (Figure 1C).

The patient underwent surgical procedure 2 weeks after the diagnostic procedures. The patient was placed in a lithotomy position under general anesthesia. Stay sutures were placed to retract the labia minora (Figure 2A). The distal urethral stricture was incised along the posterior wall using an ophthalmic scalpel (Figure 2B).

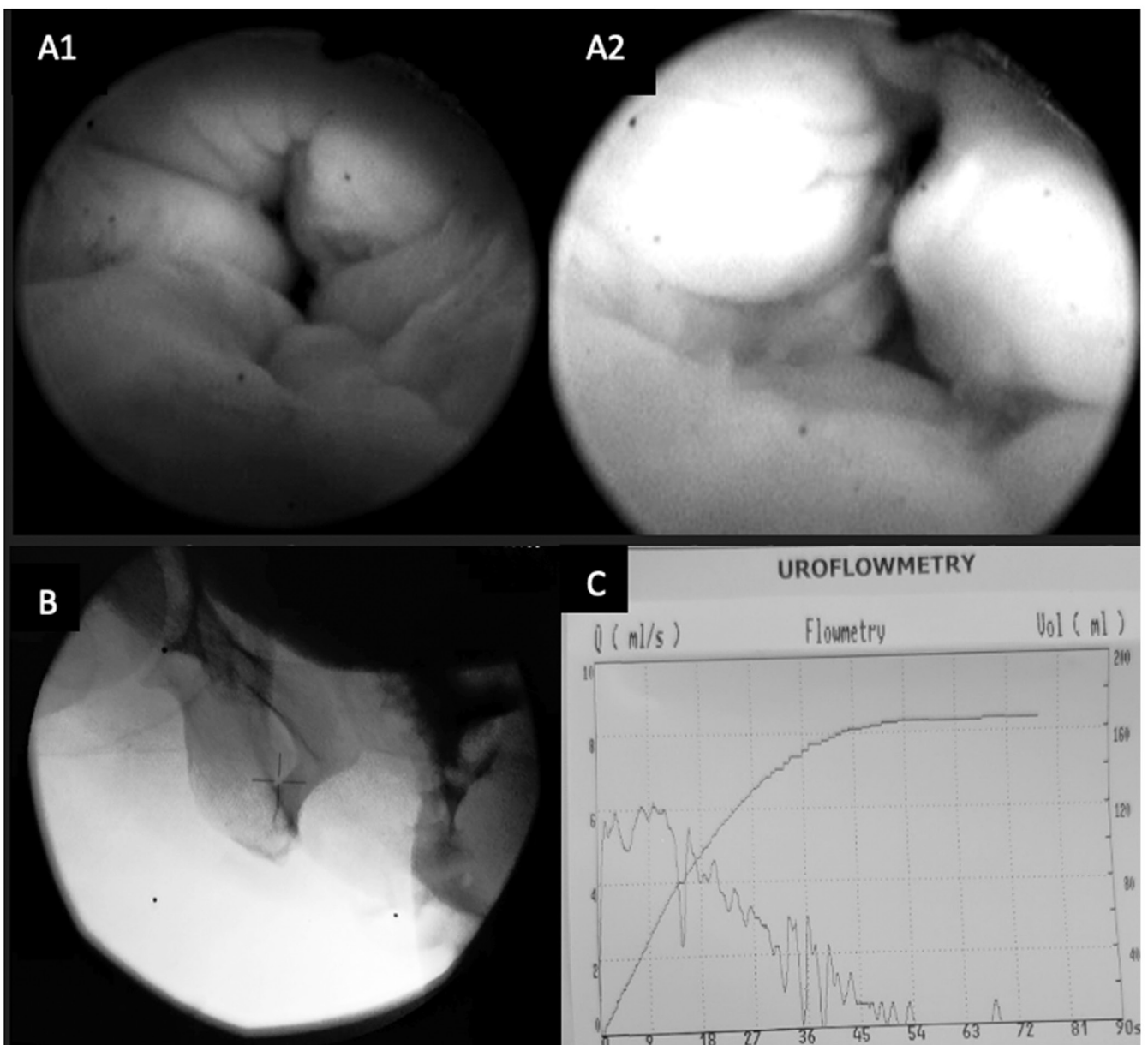
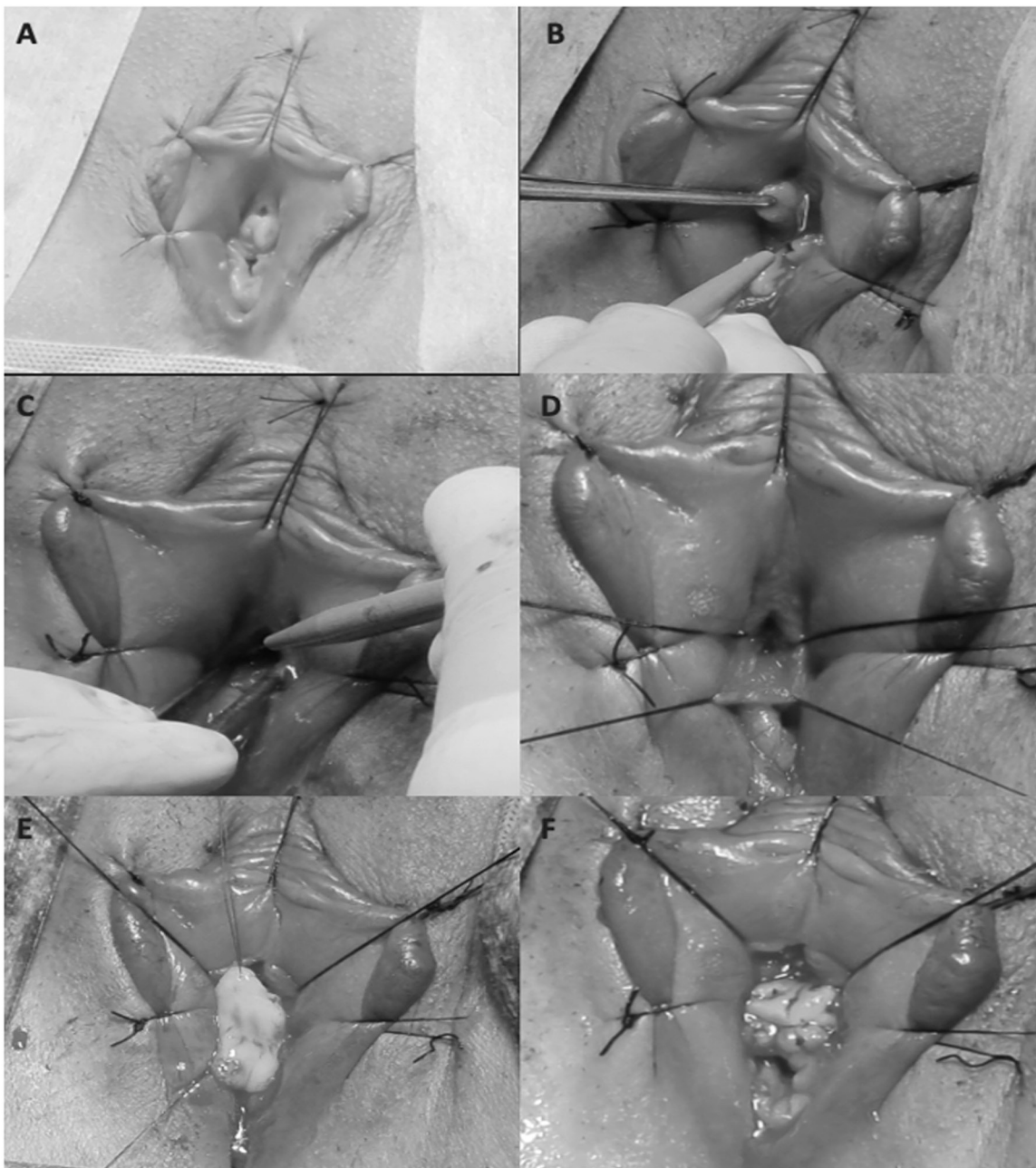


Figure 1: Pre-operative diagnostic procedures. A1 and A2) Flexible urethroscopy, B) Voiding cystourethrography, C) Uroflowmetry

Multiple incisions were made across the width of the posterior urethral wall (Figure 2C). Care was taken to make sure all fibrotic areas were incised up to the proximal urethra, without injuring the vagina. Intraoperative urethroscopy was performed using a pediatric scope to assess the adequacy of the incisions. Three vicryl 5-0 anchoring sutures were placed at the most proximal portion of the graft bed (Figure 2D). A buccal mucosal graft was

then harvested from the oral cavity using standard technique. The graft was then parachuted into the urethral lumen using the previously placed anchoring sutures (Figure 2E). Quilting sutures were placed using vicryl 5-0 to anchor the graft to the graft bed (Figure 2F). The same steps were repeated for the anterior urethral wall. A Fr14 silicone catheter was inserted and left in place for two weeks.



**Figure 2:** Surgical technique. A) Stay suture placement, B) Excision of fibrotic distal stricture, C) Posterior urethral wall incisions, D) Placement of anchoring sutures, E) Parachuting of the graft into the urethra, F) Quilting of the graft

The first follow-up was two weeks after surgery, wherein the catheter was removed. There was note of good wound healing. The grafts were healthy looking and good graft take was noted. The second and third follow-ups were at 1 and 6 months respectively. The American Urological Association (AUA) symptom score was 7 at 1 month, and 9 after 6 months. Uroflowmetry was performed at 6 months which showed a non-obstructing pattern with a Qmax of 18.6 ml/sec.

## Discussion

Unlike male urethral strictures, the treatment options for female urethral strictures are limited. Traditionally, the options were one-sided techniques that utilize dorsal onlay, ventral onlay or ventral inlay BMG grafts. Proponents of the dorsal onlay technique argued that a dorsal approach minimized the occurrence of postoperative urethral diverticulum formation. Additionally, by keeping the ventral part of the urethra intact, there is an option to perform an anti-incontinence procedure later on, if needed.<sup>6</sup> Arguments against the dorsal approach include the increased risk for de novo incontinence due to sphincter injury. One case series showed overall unsatisfactory outcomes for patients treated with dorsal onlay BMG. The authors reported one contributing factor to poor results, was underestimating the stricture length for fear of jeopardizing the sphincter mechanism.<sup>3</sup> Those who prefer a ventral onlay graft argue that a ventral urethral incision has a lower risk for new onset incontinence due to the horsehoe-shaped urethral sphincter with its ventral deficiency.<sup>7</sup> Arguments against ventral grafts include the theoretically increased risk of urethrovaginal fistula formation and ureteric injury during proximal dissection. It also renders future anti-incontinence surgery more challenging unless a Martius flap is used.<sup>8</sup> In the Philippines, urethroplasty as a mode of treatment for female strictures has been rarely used with the perceived difficulty in performing the procedure. As a result, female strictures are commonly treated with urethral dilation or internal urethrotomy. In severe cases, a suprapubic tube is inserted to permanently address the situation.

Double-faced BMG urethroplasty has often been used for male urethral strictures that are nearly obliterative in nature. This is used to further augment a urethral lumen wherein a single graft might be inadequate. Interestingly, this concept has never been utilized for female urethral strictures. Joshi, et al. first demonstrated this technique in 2020 and showed very good short-term results. Thus, the authors decided to use this particular technique once a suitable patient was found. To the authors' knowledge, this is the first reported female urethral stricture case in the Philippines which employed this particular technique.

The double-faced ventral and dorsal inlay BMG urethroplasty (Joshi Urethroplasty) is a feasible and easy to perform technique for near obliterative female urethral strictures. In the future, the authors recommend a larger case series with longer follow-up period to fully evaluate long-term outcomes for this particular technique.

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