

Managing intractable incontinence from a Yang-Monti channel in a case of enterocystoplasty with bladder neck closure – Challenges and a modified surgical technique

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ABSTRACT

Incontinence in the Mitrofanoff principle varies between 2% and 40% and is a challenging problem to treat. Incontinence is even more when a Yang-Monti channel is used with simultaneous enterocystoplasty, probably due to ineffective submucosal tunneling owing to the inferior quality of bowel mucosa. Here, we report the management options of such problems along with a novel surgical technique.

INTRODUCTION

The Mitrofanoff principle allows for a catheterizable continent cutaneous urinary diversion by employing a tubular channel from a low-pressure reservoir to the skin.^[1] However, this procedure is often associated with various complications such as incontinence, stenosis, and need for multiple reoperations. We report a case of a 45-year-old woman with intractable incontinence from a Yang-Monti channel implanted in an augmented portion of enterocystoplasty.


CASE REPORT

A 45-year-old woman presented with a history of continuous urinary incontinence from the Yang-Monti channel for 1 year. She had a history of transvaginal tape insertion for stress urinary incontinence (SUI) which had to be excised for hypercontinence. Subsequently, she underwent multiple urethral surgeries for the management of SUI which resulted in urethral erosion and total urethral loss. Eventually, she had to undergo bladder neck closure along with augmentation cystoplasty with a catheterizable Yang-Monti

channel. Postoperatively, she developed continuous urinary incontinence from the Yang-Monti channel.

She had a body mass index of 30.4 kg/m², and per abdomen examination showed a Yang-Monti channel opening at the umbilicus with two infraumbilical vertical midline scars. Assessment to rule out other causes of incontinence such as inadequate clean intermittent catheterization (CIC), incomplete emptying, overactivity, and impaired compliance of the urinary bladder was done. Her computed tomography cystogram [Figure 1a] and urodynamic assessment showed a large-capacity, normal compliant bladder with a Monti channel joining the augmented segment of the urinary bladder with a low leak point pressure. Her blood parameters were unremarkable. Endoscopy of the Yang-Monti channel demonstrated a 6 cm channel with a patulous opening at the bladder entry.

She was initially managed with plugging of the Yang-Monti tube with 10F Foley catheter with intermittent de-clamping. However, there was significant peri-catheter leak without much improvement. Subsequently, she underwent a trial of endoscopic submucosal bulking of the Yang-Monti tube which

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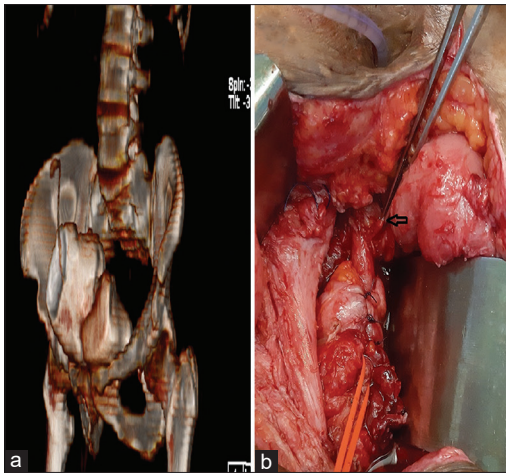


Figure 1: (a) Three-dimensional computed tomography reconstruction showing Yang-Monti channel attached to the augmented segment of the urinary bladder. (b) Buttressing wrap around Yang-Monti tube at the bladder end with 3 interrupted sutures along with the rectus fascia sling in the mid-segment (arrow)

did not result in any significant improvement in her urinary leakage. She was then subjected to an open buttressing wrap of augmented bladder around the Yang-Monti channel along with a rectus fascia sling [Figure 1b]. This was done with the idea of increasing the outlet resistance and thereby improving continence. This procedure resulted in a marginal improvement with a dry interval of 1 h that lasted only for 1 month.

Finally, we decided to augment the length of the native Yang-Monti tube and to create an adequate submucosal tunnel with the use of an isolated ileal patch which was subsequently attached to the augmented bladder.

Procedure

The distal ileum around 10 cm was isolated from the rest of the bowel with its supplying mesentery. This 10 cm ileum was divided into two segments of 2.0 cm and 8.0 cm each. The 2 cm segment was detubularized and a 7 cm Yang-Monti channel created over 10Fr infant feeding tube. Subsequently, the distal 8 cm of the ileum was opened along the antimesenteric border to create a patch. Around 6 cm of the new Yang-Monti was tunneled submucosally into the ileal patch [Figure 2a]. The bladder was opened along the junction of old Yang-Monti from where it was detached. Newly created Yang-Monti along with the ileal patch was attached to the augmented bladder, and end-to-end anastomosis of the two Monti tubes was performed [Figure 2b and c]. A suprapubic catheter was placed which was removed after 3 weeks, followed by infant feeding tube removal after 6 weeks. After a year follow-up, she was continent for 3–4 h with a bladder capacity of 400 ml and was able to perform CIC without difficulty.

DISCUSSION

The common complications of the Mitrofanoff principle are stomal stenosis (2%–10%), channel incontinence (2%–40%), stomal prolapse (2%–5%), false passage formation, and

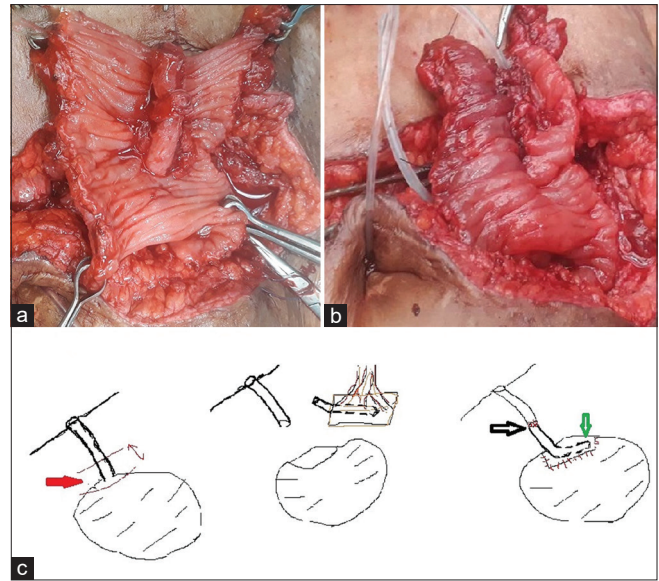


Figure 2: (a and b) 6 cm segment of Yang-Monti tube tunneled submucosally into the ileal patch. (c) Detachment of old Yang-Monti tube from the bladder (red arrow); anastomosis of old and new Yang-Monti channel (black arrow); attachment of ileal patch (green arrow)

channel kink (5%–32%).^[2,3] Incontinence is often related to changes in the volume–pressure dynamics of the reservoir. Re-evaluating the urodynamic parameters of the reservoir should be the initial step. If incontinence is due to high reservoir pressures, treatment options include increasing the rate of CIC, maximizing anticholinergic therapy, detrusor injection of botulinum toxin, or increasing the volume of the reservoir through bladder augmentation.

Most channel-related incontinence is thought to be the result of a short intravesical tunnel of the continent catheterizable channel. The problem increases when the Yang-Monti tube is implanted in the bowel segment of enterocystoplasty. Endoscopic bulking agent injection for management of channel incontinence has been reported with varying degrees of short-term success from 12.5% to 79%.^[3,4]

Open surgical repair of channel incontinence involves lengthening of the detrusor tunnel. This can be performed either by wrapping additional detrusor muscle around the extravesimal portion of the intact channel or creating a new, longer tunnel in a new location. The former is a preferred approach as it is easier to perform and avoids damage to the existing channel. Jamnagerwalla *et al.* described a serosal lined tunnel antireflux method for Yang-Monti reconstruction in cases with concomitant enterocystoplasty.^[5]

Our initial approach with the wrapping of an augmented segment of the bladder around the conduit did not provide a significant flap valve mechanism for continence. In addition, we tried to replicate the concept of pubovaginal sling using a rectus fascia sling around the conduit, however, the

tensioning was insufficient to add an occlusive mechanism. Augmenting the present conduit versus a total revision allowed preservation of the preexisting mature stoma and precluded complications associated with a double Monti tube. Furthermore, a short segmental ileal patch sufficed in creating an adequate length (6 cm) of the submucosal tunnel.

CONCLUSION

The management of incontinence in patients with the Mitrofanoff principle with a previous enterocystoplasty can be challenging. The modification of augmenting a Mitrofanoff conduit, utilizing the Yang-Monti tube along with an ileal patch for creating a submucosal tunnel, provides a viable and reproducible technique to aid in the management of these patients.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that name and initials will not be published and due efforts

will be made to conceal identity, but anonymity cannot be guaranteed.

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