

# In-situ Catheterizable Bladder Tube with Submucosal Tunneling CATHERIZABLE CHANNEL as Continent Mechanism for Urinary Diversion: A Technique

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## Abstract

**Introduction:** Patients who are unable to perform intermittent self-catheterization may undergo continent catheterizable stomas using the appendix (Mitrofanoff Appendico-vesicostomy). If the appendix is not available, the bowel is used to create a catheterizable channel (Monti-Yang-Casale technique). Patients may develop shortening of the submucosal bladder tunnel with secondary leakage after being dry from the initial procedure. We have devised a novel technique for elongation of the submucosal intravesical tunnel in patients with secondary stomal leakage due to acquired shortening of the submucosal bladder tunnel. **Methods:** An in-situ bladder tube was created from the dome of the bladder with one end attached to bladder. A submucosal tunnel of adequate length (6: 1 ratio over 10F red rubber catheter) was created. The in situ bladder tube was rotated and brought through the tunnel to create flap valve mechanism. The intravesical end of the tube is anastomosed and the other end is attached to Monti-Yang-Casale tube, which is brought out as a catheterizable stoma through the umbilicus. In the second patient, modification was used to create an in-situ tube from the posterolateral portion of the bladder, with urethral side attached to the bladder to prevent any rotation of the tube while placing it in the tunnel. **Results:** We have used this technique in two patients. The first patient, who had Monti-Yang-Casale procedures, was fully continent after initial surgery and subsequently developed urinary leakage at the stoma. The second patient had a bladder tube combined with the Monti-Yang-Casale as the primary procedure. Both patients are totally continent following the new in-situ continent bladder tube procedure. **Conclusions:** Revision for incontinence may be surgically challenging and can lead to vascular compromise. The advantages of this technique are: (1) An in-situ continent bladder tube with can be added to the Monti-Yang-Casale procedure to correct recurrent urinary stomal leak. This technique preserves the stoma loop without handling of the bowel mesentery. (2) This method can also be used as a primary method when the Monti-Yang-Casale tunnel is not sufficiently long enough to cause continence, or compromised blood supply to the Monti-Yang-Casale catheterizable tube.

## INTRODUCTION

The Mitrofanoff procedure provides a method to create a stoma that is both easily accessible and continent. The Mitrofanoff procedure has been commonly used to create a continent stoma for patients with a neurogenic bladder, patients with unsafe filling pressure that lead to renal damage, patients with congenital urinary tract anomalies, etc.<sup>1</sup> In addition to this procedure is the Monti-Yang technique. This procedure also provides the use of a segment of bowel to create a catheterizable channel for clean intermittent catheterization.<sup>2</sup> There are several variations that may be applied to these two types of channels, these include the double or full Monti-Yang technique and spiral Monte or Casale procedure (Monti-Yang-Casale technique).<sup>3</sup>

These techniques can lead to increase in the quality of life of individuals with significant urinary leakage. In addition, this may help prevent the need for dialysis in those individuals with unsafe bladder pressures. Both the Mitrofanoff and Monti-Yang technique use the principle of a submucosal tunnel to create a continence mechanism.<sup>4</sup> The length of the tunnel provides extrinsic force to keep the tunnel closed while there is no catheter in place. Patients, over time, may develop shortening of the submucosal tunnel that may lead to urinary leakage from the stoma site.<sup>5</sup> This would usually require a reoperation to recreate a longer tunnel. Second operations on these patients may lead to damage to the stoma, the catheterizable channel, and the mesentery that provides the blood supply to the channel.<sup>6,7</sup>

We describe a novel technique for the creation of a longer submucosal tunnel. This provides the added benefit of not compromising the catheterizable channel mesentery and blood supply during the procedure.

## **METHODS**

Two patients underwent the creation of an in-situ catheterizable bladder tube with submucosal tunneling. The patients were placed under general anesthesia and placed in supine position. Under sterile conditions, a foley catheter was inserted into the stoma and the bladder filled. Using both blunt and sharp dissection, the dome of the bladder was visualized and a small incision was made into the dome. A 10 French red rubber catheter was inserted into the bladder. Using the dome of the bladder, a flap was created that was at least 4cm wide to assure good blood supply to the flap. Using the 10F red rubber catheter, a bladder tube was created using absorbable 3-0 vicryl suture.

Once the bladder tube was created from the dome of the bladder with one end attached to bladder, a submucosal tunnel of adequate length (6: 1 ratio over 10F red rubber catheter) was created. The in situ bladder tube was rotated and brought through the tunnel to create flap valve mechanism. It was important to assure that the tube did not kink on itself while rotating the tube into position. The intravesical end of the tube is anastomosed and the other end is attached to Monti-Yang-Casale/ appendicovesicostomy tube, which is brought out as a catheterizable stoma through the umbilicus.

In the second patient, a modification was used to create an in-situ tube from the posterolateral portion of the bladder, with the urethral side attached to the bladder to prevent any rotation of the tube while placing it in the tunnel.

## **RESULTS**

An in situ continent catheterizable bladder tube was created successfully in two patients. There were no notable intraoperative complications noted. The postoperative recovery time was uneventful. Physical activity was resumed on post operative day 1. Both patients had Jackson Pratt drains that were removed on post operative day 3 and 4 respectively. Both patients were tolerating a regular diet by post operative day 3. The patients were discharged home with catheters in their stomas on post operative day 6.

Approximately, three weeks post operative; both patients had cystograms that demonstrated no urinary leaks and the

stomal catheters were removed. At six months, both patients were pleased with a stoma that was completely continent and easy to catheterize.

## **DISCUSSION**

Both the Mitrofanoff and the Monti-Yang-Casale procedure are commonly done for a variety of patients. One of the most common applications is to provide continence to these patients. If the procedure cannot provide adequate length to the submucosal tunnel either initially or the submucosal tunnel shortens over time, these patients may develop bothersome wetness or episodes of incontinence from the stoma site. We describe a novel technique that has been applied successfully to two patients.

The first patient, who had Monti-Yang-Casale procedures, was fully continent after initial surgery and subsequently developed urinary leakage at the stoma. The second patient had a bladder tube combined with the Monti-Yang-Casale as the primary procedure. Both patients are totally continent following the new in-situ continent bladder tube procedure.

## **CONCLUSION**

We describe a simple technique to correct stomal leakage for patients who have undergone Mitrofanoff/ Monti-Yang-Casale procedure. This technique offers the advantage of preserving the stoma loop without handling of the bowel mesentery. In addition, this technique allows the surgeon two different techniques of creating a bladder tube that can be anastomosed to an existing cutaneous stoma site.

This in situ bladder tube can also be used as a primary method when the Mitrofanoff/ Monti-Yang-Casale tunnel is not sufficiently long enough to cause continence, or there is compromised blood supply to the Monti-Yang-Casale catheterizable tube. This preliminary report describes a technique to deal with a complication of continent catheterizable stomas, but there will be a need to evaluate the efficacy of this over a longer follow up.

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