



## Application of the Two Circles Technique in the Management of Stomalstenosis of a Continent Catherizable Channel

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### Abstract

**Objective:** To describe the application of the two circular incisions technique to treat stenosis of a Continent Catherizable Channel (CCC).

**Materials and Methods:** A 59 year old female presented to clinic with difficulty catheterizing her umbilical ileovesicostomy and was found to have stomal stenosis at the level of the skin. The patient was taken to the operating room and the stomal stenosis was managed using a two circular incisions technique.

**Results:** The patient was seen for subsequent follow-up and noted to have excellent healing with no recurrence of stenosis.

**Conclusion:** Continent Catherizable Channels (CCC) can be a life-changing procedure that drastically improves a patient's quality of life. Stomal stenosis is a common complication. The two circular incision techniques is viable method for managing stomal stenosis.

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**Keywords:** Urinary diversion; Continent catherizable channel; Appendicovesicostomy; Yang-monti; Stomalstenosis; Ileovesicostomy

### Abbreviations

CCC: Continent Catherizable Channel; APV: Appendicovesicostomy-Mitrofanoff; Fr: French; CnC: Circle in Circle

### Introduction

Urinary diversion in the form of a Continent Catherizable Channel (CCC) is a life-changing procedure that can drastically improve a patient's quality of life [1]. Urinary diversion with catherizable stomas have utilized a wide range of tissue in the past, but most commonly come in the form of an Appendicovesicostomy (APV) utilizing appendix, or a Yang-Monti utilizing transverse ileum [2-5]. CCC are often used in patients with neurogenic bladders, complex lower urinary obstruction that has failed prior procedures, complex urinary fistulas, complex oncologic cases requiring a cystectomy, and those with intractable lower urinary tract symptoms post radiation as a last resort [6-8]. Though dramatic in their ability to improve quality of life, CCC's are problematic and often require intervention [2]. We describe our approach and the application of a unique technique to the management of stomal stenosis of a CCC.

### Case Presentation

A 59 years female presented to clinic with difficulty catheterizing her umbilical ileovesicostomy with a 16 Fr catheter. She has a history of uterine cancer and underwent the creation of a continent ileovesicostomy with closure of the bladder neck and a bladder augmentation. She had multiple revisions of the stoma in the past including an above fascia stomal revision in 2016, a parastomal hernia repair in 2017, and a subsequent exploratory laparotomy with a complex stomal revision at the end of 2017. These procedures were performed at an outside hospital. On exam there was a dense peristomal scar at the level of the umbilical skin. Flexible cystoscopy through the channel noted



**Figure 1:** Well healed stoma at 6 months follow-up visit.



**Figure 2:** Appearance of revised stoma at the end of the procedure.

stomal stenosis only at the skin level. She was taken to the operating room and revision of the stoma was performed using the two circular incisions technique. Follow-up at 6 months showed excellent healing and an easily catheterizable channel (Figure 1).

#### Surgical methods of two circular incision techniques

The patient is positioned in a dorsal lithotomy position, with all pressure points appropriately padded. The stoma is identified and circumscribed with a marking pen. A second outer circle is then circumscribed about 1 cm in length from the stoma resulting in two circular incisions. A total of four radial lines for flaps need to be created, at the length of 2 cm at the 2, 4, 8 and 10 o'clock positions. All of the planned incision lines are then infiltrated with 1% lidocaine with epinephrine and 0.5% Marcaine plain. The inner circle is then incised with a scalpel using a #15 blade. The stoma is then freed and cut to 16 Fr. The 16 Fr foley catheter is inserted to aid in this step. The catheter is sutured in place with 3-0 silk to act as a handle. The outer ring and skin flaps are then incised and undermined as far as possible. The outer ring is then removed with electrocautery. The efferent limb is then mobilized down to the level of the rectus fascia. Peristomal scar tissue will often be encountered. The flaps are further mobilized and defatted until they easily reach the stomal mucosa without any tension. Any stomal scar will need to be excised as this can have a profound effect on the outcome of the procedure. We use 4-0 PDS interrupted stitches to re-approximate the mucosa to the skin edges. Once the stoma is appropriately re-approximated to the flaps, the radial incisions are then closed with 4-0 PDS interrupted stitches. Prior to closing the last radial incision, we often place an 8 Fr

round Blake drain into the wound that is removed on post-operative day one. We then cut the suture holding in the 16 Fr catheters and exchange this for a fresh catheter. We inflate 10 cc of sterile water into the catheter balloon, and a drain stitch using 0-silk is used to hold the catheter in place (Figure 2). This catheter will then stay in place for 1 to 2 weeks.

#### Discussion

CCCs are problematic channels. Up to half of CCCs will require intervention, most commonly from stenosis [9]. When non-ileal or non-appendiceal tissue is utilized, the rates of complications can increase [10,11]. Ileal and appendix tissue is the most commonly used and generally has a stomal stenosis rate upwards of 50% by 126 months as shown by Sahadevan et al. [12]. Studies in the past have shown that APVs and ileovesicostomy have similar short term outcomes, but data on long term outcomes is far from conclusive [1,9,12-14]. Pagliara et al. attempted to classify catherizable channel revision into three categories [9]. Interventions above the rectus fascia, below the fascia; and/or complete channel replacement. In the case of superficial stomal stenosis at the skin level, management options are poorly described in the literature with few studies comparing the various techniques. Difficult catheterization is a common complaint in those with CCCs and can be due to stomal or channel stenosis, channel angulation, channel redundancy and/or a channel diverticulum/false passage [3,13]. In this case we experienced difficult catheterization secondary to stomal stenosis at the level of the skin. Though often not definitive, the simplest method for management for stomal stenosis is dilation with a few weeks of channel rest with an indwelling catheter [14-16]. More definitive management comes in the form of tabularized skin flaps, V-Y plasty, or VQZ plasty [9,14,17,18]. The two circular incision techniques as we describe above, have been used successfully in tracheostomal stenosis, but is poorly described in urological literature (Kamath) [19]. As Kamath et al. show in their small study, a two circular incision technique is viable and potentially superior over to the V-Y plasty. However, it must be kept in mind that this study is quite limited in its design and is poorly powered with only eight patients, thus the data is far from conclusive.

#### Conclusion

Continent catherizable channels are life altering procedures that can drastically improve a patient's quality of life. Complications with these channels are expected and will often require management. Stomal stenosis is a very common complication that can easily be managed with various skin flaps or as we have shown, a two circular incision technique.

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