

# Extracorporeal staple technique: an alternative approach to the treatment of critical colostomy stenosis

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## Abstract

*We describe an extracorporeal staple technique used to treat severe colostomy stenosis under analgo-sedation, thus avoiding relaparotomy. The surgery is performed under short-term sedation. The orifice of the stoma is widened and overgrowing skin is excised. The volume and diameter of the stoma are assessed. The anvil of a circular stapler device is inserted into the lumen of the colostomy. First bowel layers and then skin are closed with purse-string sutures. One firing of the stapler is used to reshape the stoma. The procedure takes around 20–30 min. One circular stapler is used. The patient can be discharged the same day or a day after surgery. No complications were noted in operated patients. At 6- and 12-month follow-ups, a slight narrowing of the colostomy was visible, but no recurrence of the stricture was noted. The described technique is an interesting, easy and safe alternative to previous methods of treatment for stenosed end-colostomy. Importantly, it is an extra-abdominal procedure and may be offered to patients with a history of multiple abdominal operations or with serious coexisting medical conditions in the one-day surgery setting.*

**Key words:** colostomy, stenosis, surgical staplers, one-day surgery.

## Introduction

Colostomy formation is a common and simple, but not trivial, surgical procedure performed by a variety of surgical specialists. The rate of complications remains high; difficulties occur in 21–70% of cases, and stenosis constitutes about 1–13% of postoperative problems [1–5]. Early complications such as necrosis, retraction, and peristomal abscess often lead to stenosis. The significance of these complications ranges from inconvenience in a patient's day-to-day life to being life-threatening [2, 6]. Most problems are mild or moderate and require only an enterostomal therapist's care, whereas more severe stenosis may require a range of interventions from dilation to postoperative revision in cases with im-

pending bowel obstruction [4, 7]. The typical surgical approach towards stoma stenosis consists of dilatation (seldom used), local excision of the scar or the translocation and creation of a new stoma. The latter is used mainly in patients with critical stenosis or in patients with previous attempts to correct the stoma with other treatment modalities. Here we describe a unique extracorporeal surgical technique of a stenosed colostomy excision with a circular stapler (SCECS).

## Case report

### Preoperative period

No bowel preparation is necessary. Nothing by mouth or a clear-fluids-only strategy is advisable

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from 6 pm the day before the procedure. One or three doses of prophylactic antibiotics, according to hospital guidelines, are given.

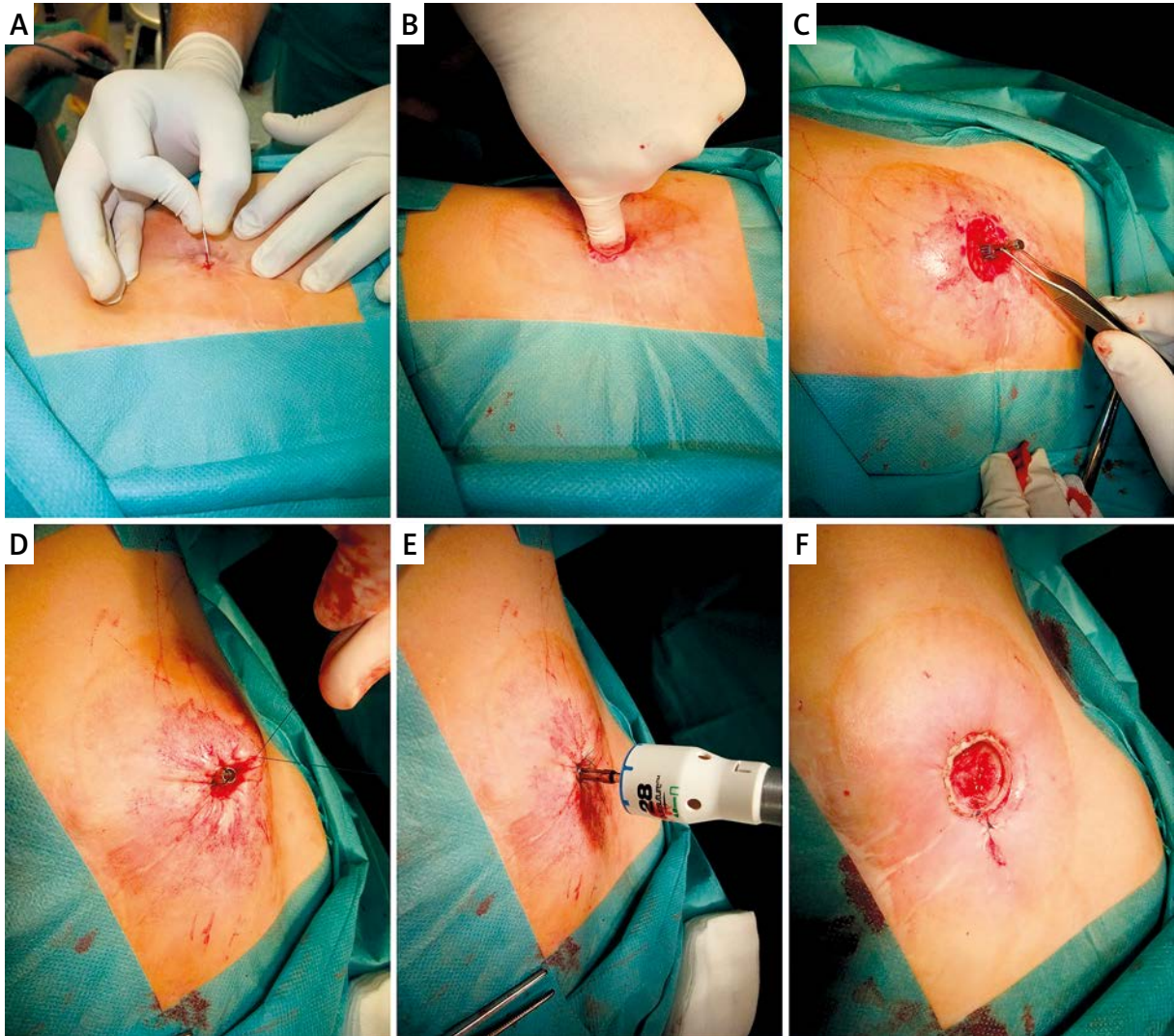
### The technique

With the patient in supine position, sevoflurane inhalational is used for sedation and intravenous fentanyl is used for analgesia. A longitudinal incision is made through the visible orifice, making possible a precise inspection of the size of the stoma and allowing an evaluation of the colon mucosa to be carried out (Photos 1 A, B). Based on this assessment, the size of the circular stapler is chosen. When a skin incision along the overgrown scar is made, it

is advised to follow the line of the scar closely rather than to use a wide excision. The anvil of the circular stapler is inserted into the lumen of the strictured colostomy (Photo 1 C). Layers of the colonic wall are approximated with a purse-string suture and another suture adapts the skin over the anvil. Both layers, skin and colon, are approximated by closing the stapler and firing it (Photos 1 D–F). The patency of the recreated colostomy is always checked.

### Post-operative period

There are no particular post-procedural recommendations. Patients can be safely discharged 2–4 h after surgery following medical assessment. Patients



**Photo 1.** Surgical procedure: **A** – incision, **B** – inspection, **C** – scar excision and anvil insertion, **D** – purse-string closure, **E** – staple closure, **F** – immediate postoperative view

should undergo training in use of bags for concave colostomy.

### Example of a patient

A 62-year-old woman presented to us with critically stenosed end-colostomy 4 years after primary radical hysterectomy complicated with recto-vaginal fistula. Before she was referred to us she underwent four laparotomies including unsuccessful correction of the strictured and retracted colostomy. On admission, the colostomy diameter was 3 mm and the patient presented symptoms of impending large bowel obstruction (Photo 2 A). The described technique was used with a good functional outcome (Photo 2 B).

### Results

The procedure takes around 30 min. One circular stapler is used. The patient can be discharged the same day or a day after surgery. No complications were noted in two operated patients. At 6- and 12-month follow-ups, a slight narrowing of the colostomy was visible (20 mm in diameter), but no recurrence of the stricture was noted.

## Discussion

### Comparison with other methods

The treatment of colostomy stenosis depends on the extent of narrowing and concomitant symptoms. The narrowing of the lumen of the stoma can occur at either the fascia or skin levels. Mild stricture does not require any treatment, while moderate, symptomatic stenosis can be dilated digitally or with Hegar's dilators. Dilation is considered a controversial management technique because it rarely achieves long-term resolution. Short-term stoma dilation may be performed, but when done over a long period of time, it may cause further stoma stenosis due to scar tissue formation [7]. Much better results with longer lasting relief are achieved through Z or W-plasty surgery. These techniques are suggested as an effective means of relieving many moderate and some severe symptomatic strictures. These procedures may, however, create a convex deformity or narrowing of the reshaped colostomy [8, 9].

The proposed SCECS procedure offers the benefit of more invasive and definite procedures, being at the same time a minimally invasive and extracorporeal procedure. Thus it can be performed as a 1-day



**Photo 2.** Example of operated colostomy: **A** – before surgery, **B** – 12 months after surgery

procedure with short-term intravenous anesthesia, allowing the patient to be discharged the same day, while still achieving the desired effect. The SCECS technique postpones the necessity of a laparotomy and creating a new stoma. It is a good alternative to the classic procedures in patients who have had several abdominal operations with re-fastening of the end colostomy.

### Advantages of the SCECS technique

Advantages of the SCECS technique: lasting effect as in more complex procedures, extracorporeal procedure, no laparotomy, no intubation, short operative time, day-surgery procedure, can be performed by resident under supervision, low cost – one circular stapler, rapid return to normal activity.

### Disadvantages

The major disadvantage of the procedure, which is the flat or convex colostomy, may be well overcome with modern day stoma care products. In patients with several previous abdominal operations the pros and cons of flat but patent ostomy need to be well balanced, and the proposed technique might be a good option.

Although not a direct disadvantage, it is worth noting that during the first few weeks after surgery, the diameter of the stoma can shrink by up to a third (Photo 2 B).

When the problem of severe colostomy stenosis is not solved with conservative treatment, dilation and SCECS then radical surgical procedures, either replacement or recreation of the stoma, are warranted. Both replacement and recreation of the stoma involve major surgery and are associated with significant morbidity. Therefore, they should be used as a last resort to resolve stoma stenosis [4, 10]. In this perspective, the proposed technique seems to be a valuable option after some further research in larger studies evaluating its safety and cost-effectiveness in comparison to Z-plasty and W-plasty.

### Conclusions

The described extracorporeal surgical technique of a stenosed colostomy excision with a circular stapler (SCECS) is a safe and easy procedure. It is an interesting alternative to other known modes of treat-

**Table I. Tips and tricks**

- Under great tension, a Benelli “round block” intradermal purse-string suture may be useful. It should be left in the skin for 4 to 8 weeks
- It is worth noting that the thick, overgrowing skin loses its elasticity with time, and therefore it is difficult to make an effective purse-string suture on it. This problem can be overcome by making a radial excision of the overgrown skin around the orifice
- The size of the stapler depends on the size of the strictured colostomy. Commonly, 21 to 25 mm circular staplers provide the best outcomes
- Significant tension in the connective tissue can result in anastomotic dehiscence. Adding a few interrupted sutures should maintain mild tension and strengthen the anastomosis

ment, especially in patients after multiple operations or with serious co-morbidities (Table I).

### Conflict of interest

The authors declare no conflict of interest.

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