



## Trephine Colostomy: Minimally Invasive Stoma Technique

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### Authors' contributions

This work was carried out in collaboration between all authors. Author EK designed the study, wrote the protocol and wrote the first draft of the manuscript. Authors FC and AE managed the literature searches and analyses of the study performed the spectroscopy analysis. Authors TA, YY and NA managed the experimental process. Author MH identified the species of plant. All author read and approved the final manuscript.

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### ABSTRACT

**Aims:** Stoma is an important part of surgical management of numerous malignant or benign anorectal diseases and anorectal injuries. This can be performed without recourse to laparotomy. This study was aimed to assess the outcome of trephine to loop sigmoid colostomy creation.

**Study Design:** The retrospective study included 18 patients who underwent trephine colostomy due to various conditions including Fournier's gangrene, inoperable anorectal cancer, recto-vaginal fistula, fecal incontinence, and rectal injury.

**Place and Duration of Study:** Izmir Katip Celebi University Ataturk Training and Research Hospital, Department of Surgery between January 2005 and January 2015.

**Methodology:** The retrospective study included 18 patients who underwent trephine colostomy. Demographic characteristics, primary pathology for colostomy decision, length of hospital stay, anesthesia technique, and early period surgical complications at 3 months were recorded.

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**Results:** Patients comprised 11 males and 7 women with a mean age of 53±5 years. The indications for stoma formation were Fournier's gangrene in 8 cases, inoperable anorectal cancer in 3 cases, high recto-vaginal fistula in 2 cases, *fecal incontinence* in 3 cases and rectal injury in 2 cases. Regional anesthesia was performed in 12 and general anesthesia in 6 cases. Only one patient (5.6%) had stricture of the stoma. There were no other complications and no additional morbidity and mortality related to TS technique.

**Conclusion:** Trepine stoma is a relatively simple, safe and rapid procedure and an effective alternative to colostomy formation without laparotomy indications.

*Keywords:* Fecal diversion; trephine; stoma; outcomes.

## 1. INTRODUCTION

Stoma is an important part of surgical management of numerous malignant or benign anorectal diseases and anorectal injuries [1-3]. The stoma may be fashioned in the form of a loop or an end stoma. Traditionally their formation involved a laparotomy [4]. Trepine stoma (TS), which is a less invasive technique with less morbidity and mortality rate, was defined by Senapati firstly in 1991 as an end sigmoid colostomy and has recently been suggested to have advantages over more traditional techniques due to avoiding laparotomy [5]. TS provide numerous advantages for the patients without laparotomy indications. These advantages include less operation time, less postoperative pain, less ileus and wound site complications, less postoperative analgesic requirement, applicability under regional anesthesia, less duration of hospital stay and it provides the opportunity of starting early chemotherapy and radiotherapy if necessary [6].

In this study, we carried out a retrospective assessment of the outcome of trephine colostomy in our own practice.

## 2. MATERIALS AND METHODS

The retrospective study included 18 patients who underwent TS due to various indications including Fournier's gangrene, inoperable anorectal cancer, recto-vaginal fistula, *fecal incontinence*, and rectal injury at Izmir Katip Celebi University Ataturk Training and Research Hospital, Department of Surgery between January 2005 and January 2015. The patient records were retrieved from the hospital database and archive files, and demographic characteristics, primary pathology for colostomy decision, length of hospital stay, anesthesia technique, and early period surgical complications at 3 months were recorded (Table 1).

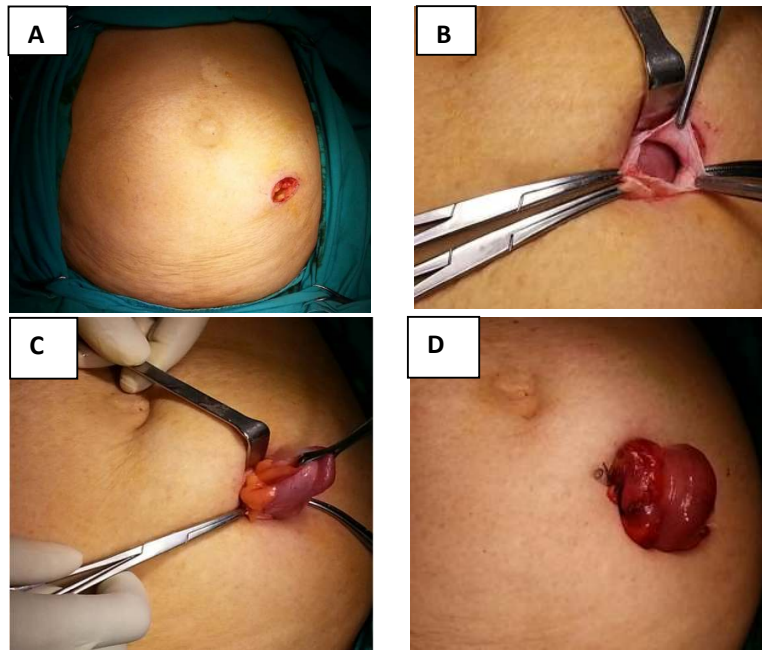
The consent of the Izmir Katip Celebi University, Ataturk Education and Research Hospital Ethics Committee was obtained for this study.

**Table 1. Characteristics of patients undergoing TS**

No of patients (n)	18
Male (%) / Female (%)	11 (61.1)/7 (38.9)
Age (years)	53±5 (range 42-70)
Indication (%)	
-Benign / Malign	15 (83.3)/3 (16.7)
- Fournier's gangrene	8 (44.4)
-Inoperabl anorectal cancer	3 (16.7)
-Recto-vaginal fistula	2 (11.1)
-Fecal incontinens	3 (16.7)
-Rectal injury	2 (11.1)
Urgent (%) / Elective (%)	13 (72.2) / 5 (27.8)
General anesthesia (%) / Regional anesthesia (%)	6 (33.3)/12 (66.7)
Morbidity (%)	1(5.6%)
Mortality (%)	-

### 2.1 TS Operative Technique

This approach involves performing an operation via a trephine incision through the left iliac fossa. The stoma site is pre-operatively marked. No bowel preparation was before surgery. To achieve a standard stoma, a disk of skin and subcutaneous tissue is incised, which can be performed via the half of the rectus abdominis muscle on either side. An incision in a cruciate fashion is made on the anterior rectus fascia, an opening is made on the rectus abdominis muscle in parallel with its fibers, an incision is made on the posterior sheath, and an opening is made on the peritoneum. If necessary, the opening may be extended in vertical or horizontal directions. Using a pair of Babcock's forceps the sigmoid colon is grasped and introduced into the wound. If needed, lateral mobilization can be performed with a short mesentery or some peritoneal adhesions by using scissors.



**Fig. 1. Trepine stoma operative technique. A: A trephine incision through the left iliac fossa, B: An opening is made on the peritoneum, C: Using a pair of Babcock's forceps the sigmoid colon is grasped and introduced into the wound, D: A loop sigmoid colostomy is then formed without the need for laparotomy**

When the orientation has been confirmed, a loop sigmoid colostomy is then formed without the need for laparotomy (Fig. 1 above).

### 3. RESULTS AND DISCUSSION

A total of 18 patients underwent TS surgery. The patients included 11 (61.1%) males and 7 (38.9%) women with a mean age of  $53 \pm 5$  (range 42-70) years. When loop colostomy was evaluated by the aim of fecal diversion, it was seen that TS technique was preferred in Fournier's gangrene in 8 (44.4%) cases, inoperable anorectal cancer in 3 (16.7%) cases, high recto-vaginal fistula in 2 (11.1%) cases, fecal incontinence in 3 (16.7%) cases and rectal injury in 2 (11.1%) cases. Regional anesthesia was performed in 12 (66.7%) and general anesthesia in 6 (33.3%) cases. TS was applied under emergency conditions in 13 (72.2%) cases and under elective conditions in 5 (27.8%) cases. The temporary stomas (8 patients) were closed 3 months after first operation. Only one patient (5.6%) had stricture of the stoma. There were no other complications and no additional morbidity and mortality related to TS technique. The median length of stay was 12.4 days.

Trepine stoma technique can be applied as ileostomy or colostomy, end or loop. Technique

at first was determined at 1991 by Senapati and Phillips as end sigmoid colostomy at 16 cases [5]. Soyder et al. [7] performed TS in 23 patients due to various indications including perineal sepsis, inoperable anorectal cancer, recto-vaginal fistula, fecal incontinence, and sigmoid volvulus. Patel et al. performed TS in 31 patients due to palliation for in-operable or locally recurrent rectal carcinoma, anal carcinoma, high fistula in ano, inflammatory bowel disease, incontinence, and recto-vaginal fistula [8]. In our study, we performed TS in 18 patients due to Fournier's gangrene, inoperable anorectal cancer, high recto-vaginal fistula, fecal incontinence and rectal injury. We performed loop sigmoid TS in all the patients.

Many techniques were described to help proximal to distal orientation, including palpation of the root of mesocolon, intraoperative sigmoidoscopy, laparoscopy, insufflation of air per rectum, and/or a saline injection via a catheter introduced through the colostomy [8]. A technique which combines intraoperative colonoscopy with a diverting, 'trepine' sigmoid colostomy, was described to help the surgeon to identify the correct loop of bowel to avoid inadvertent maturing of the wrong end of the divided colon [9]. The method of sigmoidoscopy-

assisted colostomy can be beneficial to the high risk patients needing fecal diversion but unable to tolerate a laparotomy or laparoscopy [7]. Sigmoidoscopy or colonoscopy can be used to identify a site of the sigmoid colon that could easily be approximated to the anterior abdominal wall as confirmed by transillumination of the abdominal wall. It is also used as a guide to identify the proximal and distal limbs of the loop colostomy. It can be accomplished using a local or regional anesthetic with sedation [6,7].

As a common opinion of all these study it is stated that besides trephine stoma use is applicable in extensive indication area, technique is not only applicable but also proof, by comparison with ostomy made via classic laparotomy it has less morbidity and mortality rate, it can be used quickly and so laparotomy is needed rarely [7]. Patel et al. [8] performed TS in 31 patients, and the laparotomies in 9 cases were constructed due to immobile sigmoid colon. Oguz et al. study and in our study, no laparotomy was needed [6].

Complications related to the stoma have been reported including retraction of the stoma, stricture of the stoma, prolapse of the stoma, parastomal hernia, and acute urinary retention [6,8]. Soyder et al. [7] performed TS in 23 patients and one patient underwent second surgery due to colostomy descent. Senapati and Phillips reported retraction in 13% of the patients [5]. In our study, only one patient had stricture of the stoma.

Oğuz et al. [6] and Soyder et al. [7] studys, mean length of hospital stay was 14 days. In our study, mean length of hospital stay was 18 days, but in 50% of the cases such as the ones with Fournier's gangrene.

#### 4. CONCLUSION

A trephine stoma formation without the need of laparotomy is a suitable alternative to diagnostic laparoscopy and stoma formation.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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