

Inadvertent Transverse Colostomy – An Uncommon And Much-Feared Complication Of Trephine Sigmoid Colostomy. Case Report And Literature Review.

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Citation

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Abstract

Temporary or permanent diversion of the fecal stream may be an effective part of the management of a wide range of disease processes. Trephine sigmoid colostomy is usually done under local or regional anesthesia in high-risk patients. It involves performing the operation via trephine incision through which the bowel is manipulated and brought up as colostomy. It has the advantage of avoidance of a laparotomy which significantly reduces postoperative discomfort, wound complications, and accelerates recovery. Although it is considered as safe procedure, it carries an increased risk of inadvertent transverse colostomy and misidentification of proximal/distal bowel, which may result in iatrogenic large-bowel obstruction. We report a case of inadvertent transverse colostomy resulting in large bowel obstruction in a 57-year-old lady with multiple co-morbidities and short bowel syndrome.

INTRODUCTION

We report an uncommon but much-feared complication of trephine sigmoid colostomy which combined both inadvertent transverse colostomy and misidentification of the proximal and distal loop of the colon, resulting in closure of the proximal loop and bringing up the distal loop as stoma and inducing iatrogenic total bowel obstruction. We explore the literature for the indications, benefits and pitfalls of this technique.

CASE PRESENTATION

A 57-year-old lady was admitted to the medical ward at KFMC, Riyadh, because of frequent diarrhea and perianal skin excoriation. She was a known case of ischemic heart disease, hypertension, hypothyroidism and atrial fibrillation on medication. Her frequent diarrhea was due to short-bowel syndrome as she had had excision of a large portion of her small bowel, ascending colon and part of the transverse colon secondary to bowel ischemia 3 month prior to admission. Her surgery was complicated with right femoral vein thrombosis and she had an inferior vena cava filter inserted to prevent pulmonary embolism (figure 1).

She was overweight, weighing 138 kg, with a body mass index of 38% and was suffering from severe arthritis

limiting her movement. Due to her short-bowel syndrome, daily bowel motions resulted in more than 20 visits to the toilet per day, an aggravation further confounded by her excess weight and the difficulties involved in moving, seating and cleaning herself. Despite trials of medical treatment including dietary advices, bulking and constipating agents her symptoms could not be controlled and ultimately, her quality of life and self-dependence suffered substantially.

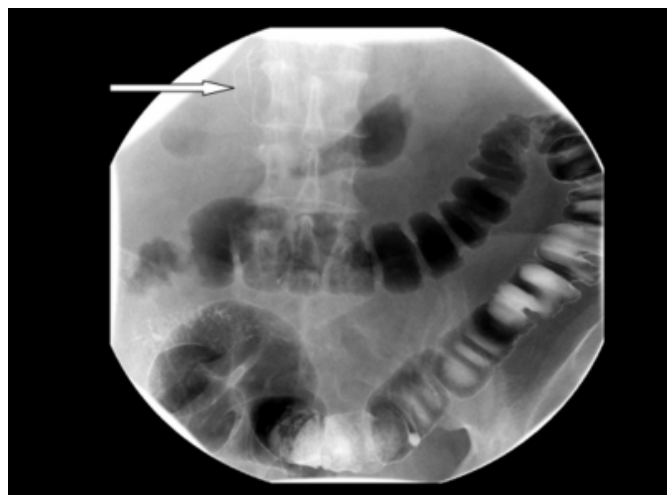
Her symptoms were very distressing, leading her to become very depressed, isolated and self-negligent. The patient, her family and the treating physician came to the collective conclusion that an end sigmoid colostomy would improve her self-dependence although it may not offer much to her overall symptoms. The surgical team was consulted for performing a colostomy and a detailed explanation of the complications of the surgery and colostomy, particularly with the co-existing multiple co-morbidity factors was provided. The possibility that it may actually worsen her symptoms was also highlighted, and the patient along with her family, after balancing all the information, eventually opted to go ahead with the colostomy.

In addition to routine preoperative investigations, a barium enema was done to map out the colon. The contrast medium introduced through the rectum passed freely till the large and

small bowel anastomotic region showing shortness of the large bowel which was mostly due to her previous surgery (figure 1).

Figure 1

Figure 1: Barium enema showing the large bowel up to the level of the anastomosis between the transverse colon and the ileum. Observe the inferior vena cava filter (arrow).



A CT scan was also obtained which showed, in addition to the subtotal resection of small bowel with right hemicolectomy, bilateral moderate pleural effusion and bilateral basal atelectasis which added to the patient's comorbidities (figure 2&3).

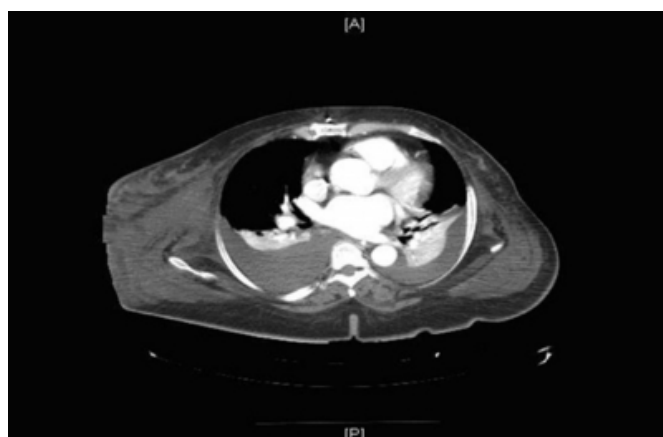
Figure 2

Figure 2: Abdominal CT scan showing a short small-bowel segment anastomosed to the distal part of the transverse colon.



Figure 3

Figure 3: Chest CT scan showing bilateral moderate pleural effusion and bilateral basal atelectasis.



No bowel preparation was needed apart from keeping her on free fluids for two days before surgery. The site of the proposed colostomy at a point half way between the umbilicus and the left anterior iliac spine was marked preoperatively.

The procedure was carried out under local anesthesia and mild sedation.

A standard colostomy opening was made by incising a disk of skin and subcutaneous tissue at the pre-marked site. The anterior rectus fascia was incised in a cruciate fashion, the rectus muscle was split along its fibers, the posterior sheath was incised, and the peritoneum was opened. The abdominal wall was lifted from the bowel by forward retraction. A Babcock was introduced inside the abdomen and what apparently looked like the sigmoid colon was grasped and easily manipulated out through the incision. The bowel was divided using a gastrointestinal anastomosis (GIA) stapler. The proximal end was brought out as stoma while the distal end was returned inside the abdomen after dividing the mesocolon between the two limbs. The proximal colon was tested by passing a catheter which passed in upward direction.

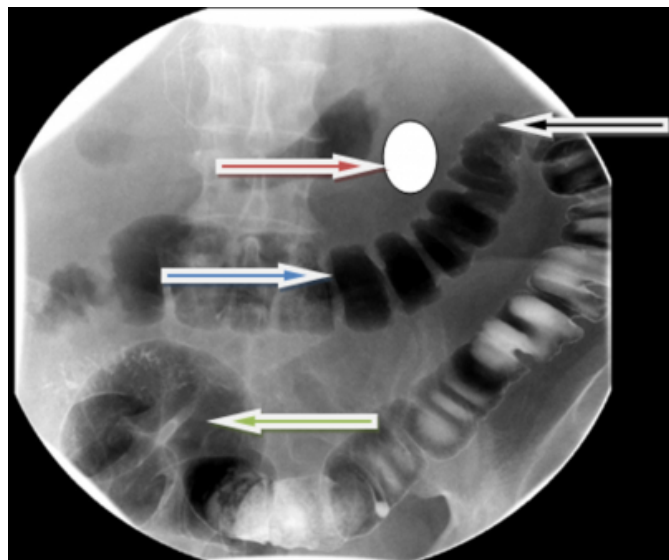
The patient recovered well from surgery but the stoma failed to function for 3 days. She started to vomit whatever she took but she did not get abdominal distension as her short bowel could not accommodate large amounts of fluid and air to cause distention.

Reviewing the x-rays post-operatively we strongly suspected that we did inadvertent transverse colostomy together with reversing the bowel ends as it was obvious that the sigmoid

colon was very short and was lying deep in the pelvis. The transverse colon was displaced downward and was lying immediately behind the proposed site of the colostomy just above the iliac bone. It was very clear that picking up the colon at this point resulted in bringing out the transverse colon rather than the sigmoid colon with an anatomical orientation leading to misidentification of proximal and distal ends (figure 4).

Figure 4

Figure 4: The red arrow indicates the site of the colostomy opening. The transverse colon was lying behind the colostomy opening while the sigmoid colon (green arrow) was short and was lying deep in the pelvis far away from the opening. Picking up the colon at the colostomy opening brought up the transverse colon rather than the sigmoid colon, with an anatomical orientation that the distal end (black arrow) looked as proximal and the proximal end looked as distal (blue arrow).



A gastrografen study through a catheter inserted in the stoma showed that the dye passed down into the rectum instead of going up in the descending colon (figure 5).

Figure 5

Figure 5: A Gastrografen study through a catheter inserted in the stoma showed that the dye passed down into the rectum instead of going up in the descending colon.



This was further confirmed with barium given through the rectum which passed upwards till it reached the colostomy opening; after the examination, some contrast medium was noticed in the colostomy bag (figures 6 & 7).

Figure 6

Figure 6: Barium given through the rectum passed upwards till it reached the colostomy opening

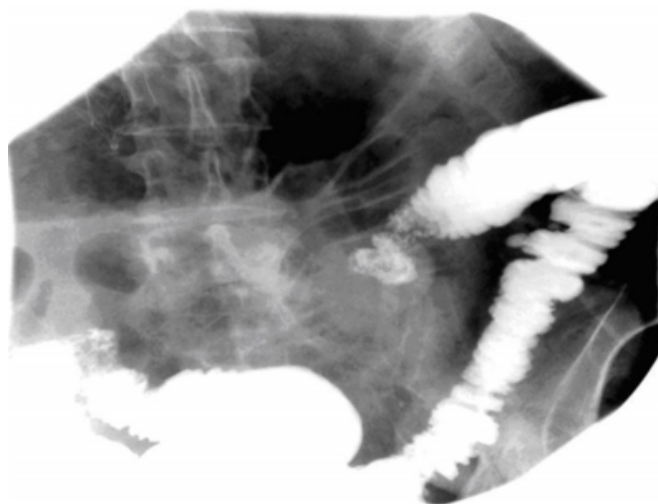


Figure 7

Figure 7: Delayed film showing that most of the barium passed out in the colostomy bag.



After full explanation to the patient and her family, she was taken back to the theatre on the third postoperative day and the reversed ends of the colostomy were corrected.

DISCUSSION

Temporary or permanent diversion of the fecal stream may be an effective part of the management of a wide range of disease processes.

The formation of a colostomy is one of the easiest of bowel procedures for a surgeon to perform and surgeons are often shown how to do it early in their training. It is also one of the easiest operations to perform badly (1).

Traditionally, the operation is performed at laparotomy, but avoidance of a laparotomy significantly reduces postoperative discomfort, wound complications and accelerates recovery (2, 3 & 4). Other advantages may include limitation of postoperative narcotics, shorter hospital stay, and earlier initiation of other therapies such as chemotherapy or radiation therapy (5).

Minimally invasive techniques have been applied with increasing frequency to intestinal surgical procedures including stoma creation and end stoma reversal. Minimally invasive approach includes trephine, laparoscopic, or combined approach (5).

Trephine colostomy is usually done under local or regional anesthesia in high risk patients. It involves performing the operation via trephine incision through which the bowel is manipulated and brought up as colostomy.

Although trephine stoma formation is recommended by

some authors as the preferred method of ileostomy or colostomy formation when laparotomy is not otherwise indicated (6, 7), it carries an increasing risk of inadvertent transverse colostomy and misidentification of proximal/distal bowel (8, 9 & 10), which may lead to closure of the proximal bowel and construction of a mucous fistula. This can occur in two ways. The first is that sigmoid colon is appropriately identified, but the distal limb mistakenly brought out as the stoma. The second is that a floppy, redundant transverse colon is misidentified as sigmoid colon, so that the wrong end is brought up (11). Complication rates were reported as high as 25% with this technique (12).

Differentiation between the sigmoid colon and the transverse colon can be established on anatomical features like appendices epiploicae, omental attachments, and left lateral peritoneal attachments but anatomy can be so deceiving (11), especially if distorted by adhesions or previous surgery. Obesity is another contributory factor.

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, 'trephine' 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 (13).

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 (14, 15).

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 (16)

Laparoscopic fecal diversion procedures can be performed safely, simply, and effectively (17, 18). Apparent advantages over standard techniques are avoidance of a laparotomy, while maintaining the ability to precisely identify and orient the pertinent bowel segment and rapid return of bowel

function (19).

Campbell presented and commented on a similar case of misidentification of proximal and distal bowel limbs in a 39-year-old woman with chronic peri-anal fistulas and infected anal sinuses that underwent laparoscopic diverting colostomy and developed post-operative large-bowel obstruction resulting from inadvertent transverse colostomy (11).

Frizelle reported a case of trephine colostomy in which air insufflation incorrectly identified the distal limb. Disaster was averted by correct identification at laparotomy (20).

Although there are no studies documenting the incidence of this complication, to our knowledge our case is one of few reported cases about this mishap.

Retrospectively, we feel that this complication was preventable if the pre-operative x-rays were carefully studied; the downward displacement of the transverse colon together with distortion of the anatomy should have at least indicated sigmoidoscopic or laparoscopic assisted colostomy rather than blind trephine colostomy. We also feel that reporting of such complication is essential for young surgeons to learn from mistakes of the others rather from their own mistakes.

SUMMARY

Temporary or permanent diversion of the fecal stream may be an effective part of the management of a wide range of disease processes. Minimally invasive techniques have been applied with increasing frequency to intestinal surgical procedures including stoma creation. Trephine sigmoid colostomy may be appropriate in high-risk patients who are in need of fecal diversion and cannot tolerate laparotomy. Special care should be taken in identification of the sigmoid colon, distal and proximal loops, when performing a stoma by this technique. In presence of adhesions and anatomical distortion it is always advisable to combine the procedure with laparoscopic or sigmoidoscopic assistance.

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