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Klinik Çalışma

In-sleeve on-table colonic irrigation in telescopic fashion and intraoperative colonoscopy: a novel technique

Ameliyat masasında kalın bağırsağın kılıf içine yıkanması ve ameliyat sırasında kolonoskopi: Yeni bir teknik

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BACKGROUND

In the management of large bowel obstruction, on-table lavage and intraoperative colonoscopy allow a safe resection and primary anastomosis in selected patients. Previous techniques carry serious disadvantages, in the form of inconvenient drainage route and spillage. A novel technique of in-sleeve on-table colonic lavage using a camera sleeve is described.

METHODS

Six patients (58-80 years old, median 73) who admitted to emergency service between 2003 and 2009 with colonic obstruction due to tumor underwent colonic resection and primary anastomosis after on-table lavage. The colon was divided proximally to the obstruction, and then was introduced into a nylon sleeve and sutured. A Foley catheter was inserted to the cecum for irrigation. After irrigation, intraoperative colonoscopy was accomplished.

RESULTS

The technique was successfully used in all patients. The colonic irrigation took 12-16 minutes and colonoscopy was completed in 7-20 minutes. There was no contamination during the washout of the colon. Four patients underwent left hemicolectomy; extended right hemicolectomy and total colectomy was performed in the remaining two. There were no complications in the postoperative period.

CONCLUSION

The described technique of in-sleeve on-table lavage is safe and quick to washout the fecal load in the obstructed colon. It prevents the contamination risk and shortens the operative period for resection and primary anastomosis. This method also enables an effective intraoperative colonoscopy.

Key Words: Colonic neoplasms; in-sleeve; intraoperative colonoscopy; irrigation; on-table lavage.

AMAÇ

Kalın bağırsak tıkanmalarının tedavisinde ameliyat esnasında bağırsak yıkaması ve kolonoskopisi, seçilmiş hastalarda, güvenli bir rezeksiyon ve primer anastomoz yapılmasına imkân vermektedir. Ancak önceden kullanılan teknikler uygun olmayan boşaltma yolu ve saçılma gibi ciddi sakıncalar taşımaktadır. Kolonun ameliyat masasında bir kamera kılıfı içerisinden ileriye doğru yıkanması, risklerin önlenmesi amacıyla yeni bir teknik olarak tanımlanmaktadır.

GEREÇ VE YÖNTEM

2003 ve 2009 yılları arasında tümöre bağlı kalın bağırsak tıkanıklığı nedeniyle acile başvuran altı hastaya (yaşları 58-80, median 73) ameliyat masasında bağırsak temizliği yapıldıktan sonra kalın bağırsak rezeksiyonu ve primer anastomoz uygulandı. Kalın bağırsak, tıkanmanın proksimalinden kesilip proksimal uç bir naylon kılıf içine sokuldu. Kılıf bağırsağa sıkıca dikildi. Kolonun yıkaması için bir Foley kateter appendiksten çekuma ilerletildi. Yıkamadan sonra ameliyat sırasında kolonoskopi yapıldı.

BULGULAR

Teknik tüm hastalarda başarıyla uygulandı. Kalın bağırsağın yıkanması 12-16 dakika sürdü, kolononoskopiler ise 7-20 dakikada tamamlandı. Kalın bağırsağın yıkanması sırasında bulaş olmadı. Dört hastaya sol hemikolektomi, birine genişletilmiş sağ hemikolektomi diğerine ise total kolektomi uygulandı. Ameliyat sonrası dönemde komplikasyon gelişmedi.

SONUÇ

Tanımlanan ameliyat masasında kılıf içi(ne) yıkama tekniği, tıkanmış kolonun dışkı yükünün boşaltılmasında çabuk ve güvenlidir. Bulaş riskini azaltır ve primer rezeksiyon anastomoz için ameliyatın süresini kısaltır. Bu yöntem aynı zamanda ameliyat sırasında etkin bir kolonoskopiye olanak sağlar.

Anahtar Sözcükler: Kolon neoplazmı; kılıf içi; ameliyat sırasında kolonoskopi; temizlik; ameliyat masasında yıkama.

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In the management of emergency colonic surgery, on-table lavage was described to remove fecal bacterial load of the colon to perform a safe colocolic anastomosis in peritonitis and obstruction. On-table colonic irrigation was first introduced by Muir[1] in 1968 and modified later by Dudley and colleagues.[2] Since then, different modifications using tubes have been proposed for controlled washout. However, these tubes are prone to be obstructed with feces. This prolongs the irrigation period, increases the need for volume and may even cause spillage. In-sleeve on-table colonic irrigation is based on the idea that "nothing can be larger than the lumen of the colon by itself". This technique was described not only to perform a safe primary anastomosis but also to prevent excessive colonic surgery in the emergency setting for obstructed left colon carcinomas. Intraoperative colonoscopy allows evaluating the corresponding lesions of the colonic mucosa, such as synchronous tumors in obstructing tumors. Previously, it has been reported that when a left-sided lesion is treated as a sentinel lesion, important right-sided pathology is found in nearly half of the patients.[3,4] Obviously, an effective washout of the fecal load would be helpful for achieving a successful intraoperative colonoscopy.

MATERIALS AND METHODS

Between 2003 and 2009, three female and three male patients (58-80 years, median 73) admitted to the emergency service with symptoms suggesting bowel obstruction. The patients suffered abdominal pain and distention, nausea and vomiting. Plain abdominal films showed bowel obstruction. Abdominal computed tomography or magnetic resonance imaging studies were relevant to a tumor obstruction in the colon. Three patients had a tumor at the splenic flexura, two in the sigmoid and one in the transverse colon. Preoperative attempts of flexible colonoscopy had failed to reach the tumor and/or beyond the tumor site. All patients underwent primary resection and anastomosis after colonic irrigation into a nylon camera sleeve, termed as "in-sleeve on-table lavage", and intraoperative colonoscopy. One patient with sigmoid obstruction who underwent total colectomy had an incarcerated right inguinal hernia including right colon in the hernial sac accompanying a villous adenoma. In the patient who had a giant villous adenoma in the transverse colon, videoscopic colonoscopy revealed a carcinoma in the cecum and therefore extended right hemicolectomy was performed. There were no synchronous lesions in the remaining patients.

Techniques

Procedures for the in-sleeve on-table colonic lavage and intraoperative colonoscopy:

1. Place the intestinal clamps proximally to the tumor at 6 to 8 cm distance.

2. Divide the colon near the distal clamp (preferably using a linear stapler) on a towel.

3. The distal end of a nylon camera sleeve is worn on the proximal end of the colon (do not tear the tip of the nylon sleeve -normally proximal side, which is designed for camera connection- which is to be used as a bag for prevention of distracting odor in the theater).

4. a. Place another clamp on the introduced segment from outside the sleeve while the proximal clamp is taken out (alternative: introduce the proximal clamp in the sleeve and let it go into the sleeve-bag and inform the nurse). b. Before (a), preferably a purse-string suture can be applied to the colonic opening by taking the suture out of the sleeve to control washout and entrance of the scope.

5. Continuously and tightly suture the sleeve to the bowel with 2.0 prolene to prevent leakage.

6. Prepare the appendix and introduce a 20F Foley catheter in to the cecum.

7. Inflate the balloon and fix the catheter to the appendix.

8. Place an intestinal non-crushing clamp on the distal ileum to prevent backward wash.

9. Carry out colonic irrigation with warm saline through the irrigation catheter and allow washout into the nylon sleeve (which is placed into a waste container on the floor) (Fig. 1).

10. Be sure that the irrigation fluid is completely clear before stopping irrigation (empty the colon by milking into the sleeve).

11. Make a hole on the superior side wall of the sleeve and introduce the scope into the colon. Put an outer clamp on the in-sleeve segment to achieve effective insufflation for flexible colonoscopy (Fig. 2).

12. Perform intraoperative colonoscopy.

13. Take out the ileal clamp and the irrigation catheter and then perform cancer surgery.

There was no contamination of the surgical field during on-table lavage and intraoperative colonoscopy. In two patients, flexible colonoscopy and underwater videocolonoscopy[5] using a laparoscope were performed together. The volume of irrigated saline was 3-6 L in 12-16 minutes. Subsequent colonoscopic examination added 7-20 minutes to the procedure. Left hemicolectomy was performed and primary anastomosis was achieved using a circular stapler. There was no anastomotic leakage or wound infection in the postoperative period. Postoperative hospital stays ranged between 7 and 14 days. Pathologic examination revealed adenocarcinoma for the index lesions. A flexible colonoscopy performed three months postoperatively confirmed there were no missed lesions.

DISCUSSION

In the management of obstructing large bowel tumors, the current trend favors one-stage surgery and primary anastomosis; if there is no inconvenient condition. However, the phrase "one-stage treatment of left-sided bowel obstructions" requires clarification since some authors proposed subtotal or total colectomy[6-8] for "one-stage surgery", some defended segmental resection and primary anastomosis with on-table colonic irrigation[9-13] and others offered the same without colonic lavage.[14-16] Another approach is colonic stenting as a "bridge to surgery" to allow primary anastomosis for the obstructing left-sided colorectal cancer.[17,18] However, Tilney et al.[18] reported that there is no evidence of differences in long-term survival between those who have stents followed by subsequent resection and those undergoing emergency bowel resection.

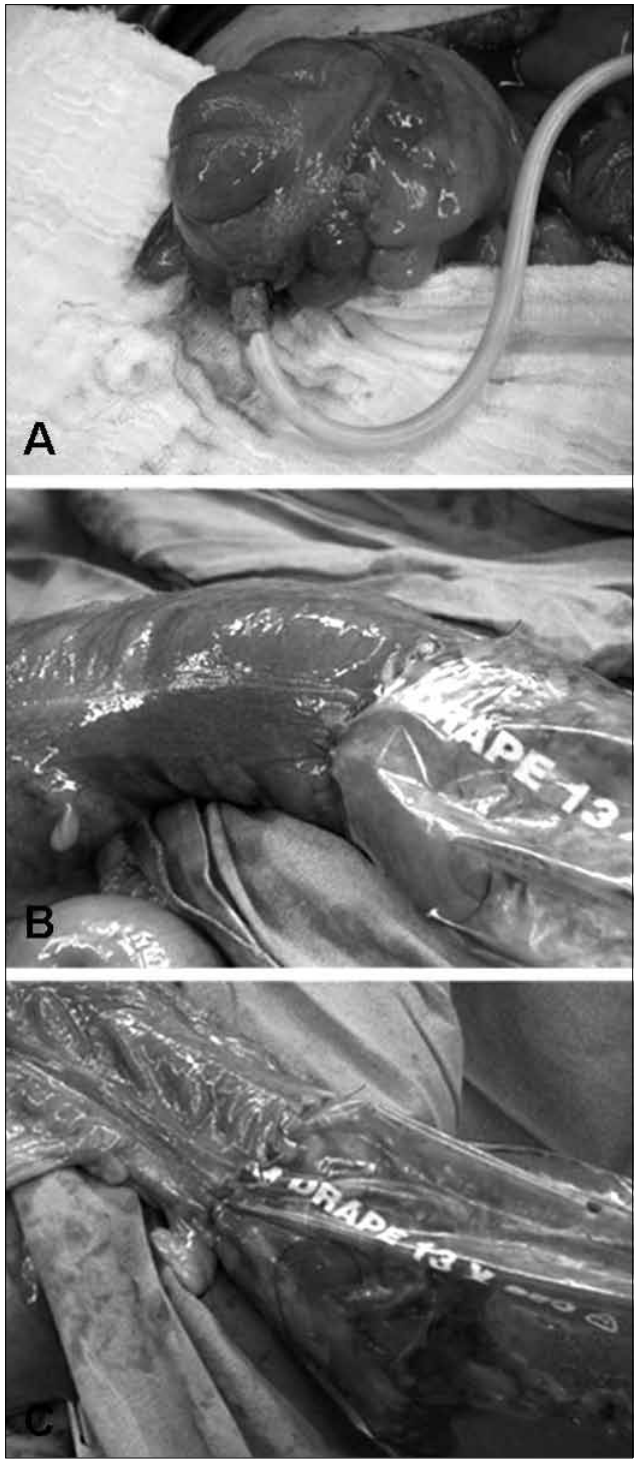

Fig. 1. **(a)** Placement of the irrigation catheter into the cecum through the appendix. **(b)** Introduction of the colon into the nylon sleeve by telescopic method and fixation with continuous 2.0 prolene suture. **(c)** On-table colonic irrigation and washout into the nylon sleeve.

Fig. 2. Outer clamping of the colonic opening in the sleeve provides adequate insufflation during intraoperative flexible colonoscopy procedure through the nylon sleeve.

Conventional means of on-table colonic lavage are very cumbersome and time-consuming and may increase the risk of contamination. It has been reported that on-table lavage and primary anastomosis carry 5-6% anastomotic leakage risk and death rate.[10,19,20] Dafnis[21] suggested taking the colonic segment out of the abdomen on an extra drape coverage and emptying the colon directly into a bucket. This method may require additional dissection and still carries a risk of spillage in proximity to an open abdomen. Different techniques using tubes have been described to remove the colonic contents.[3,12,20,22,23] These tubes are narrower than the colonic lumen and, therefore, likely to be blocked by thick contents. When this disappointing occurrence was encountered, the procedure presents a nuisance to the surgeon because of the discrepancy between the tissue and material flexibility. Such a problem may also be a messenger of a forthcoming spillage and contamination. Since no caliber can be larger than the colonic lumen itself, suturing a camera drape on the colon in telescopic fashion was found to be helpful to establish an effective colonic outflow without contamination risk. Therefore, the technique of in-sleeve on-table lavage is easy to apply, quick to

washout the colon, and also allows a convenient route for intraoperative colonoscopy.

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