Surg Endosc (2014) 28:1263–1268
DOI 10.1007/s00464-013-3320-x

Identifying causes for high readmission rates after stoma reversal

Deborah S. Keller · Zhamak Khorgami · Brian Swendseid · Sadaf Khan · Conor P. Delaney

Received: 17 June 2013 / Accepted: 4 November 2013 / Published online: 27 November 2013

Abstract

Background Unplanned readmissions after colorectal surgery impact patient and financial outcomes. Our goal was to identify factors related to readmission in ostomy reversal patients.

Methods Review of a prospective department database was performed from 2006 to 2012 to identify patients who underwent an ostomy reversal. Patients were stratified into nonreadmitted and readmitted within 30 days of ostomy reversal. The main outcome measures were predictors of readmission and characteristics of patients readmitted and not readmitted.

Results A total of 351 ostomy reversals (86 % ileostomy and 14 % colostomy) were analyzed; 44 patients were readmitted (12.5 %). Readmitted and nonreadmitted patients were similar in age, body mass index, gender, comorbidities, indications for the index operation, and time to ostomy reversal. Readmitted patients had longer operative times ($p = 0.002$) and length of stay ($p = 0.001$), more intraoperative blood loss ($p = 0.003$), intraoperative complications ($p = 0.005$), ICU requirements ($p < 0.0001$), need for temporary nursing at discharge ($p < 0.001$), and higher total hospital costs than nonreadmitted patients ($p = 0.0162$). Longer operative time [odds ratio (OR) 1.006, 95 % confidence interval (CI) 1.001–1.012], intraoperative complications (OR 7.334, 95 % CI 1.23–43.761), ICU stay (OR 1.291, 95 % CI 1.18–1.893), delayed discharge (OR 1.085, 95 % CI 1.003–1.173), and discharge to skilled nursing facility (OR 6.936, 95 % CI 1.531–31.332) were independent predictors of readmission. Ostomy type had no independent effect on readmission.

Conclusions Differences in perioperative and outcomes variables exist between readmitted and nonreadmitted patients after ostomy reversal. Longer operative times, intraoperative complications, intensive care unit care, longer length of stay, and skilled nursing at discharge were independently predictive of readmission. These findings can be used to identify high-risk patients prospectively, potentially improving clinical outcomes and healthcare utilization.

Keywords Ileostomy · Colostomy · Enhanced recovery pathways · Patient outcomes · Readmission rates · Colorectal surgery

Unplanned readmissions after colorectal surgery are a common and costly problem. Studies from have shown 30-day readmission rates after colorectal surgery are increasing in the United States, from an estimated 10.2 % between 1986 and 1990 to 13.7 % between 2001 and 2005 [1]. For colorectal surgery alone, the cost of readmission is estimated $9,000 per episode, accounting for $300 million annually nationwide. With new penalties for readmitted patients, postoperative readmissions are emerging as a

D. S. Keller (✉) · Z. Khorgami · S. Khan · C. P. Delaney
Division of Colorectal Surgery, Department of Surgery, University Hospitals-Case Medical Center, Case Western Reserve University, 11100 Euclid Avenue, Cleveland, OH 44106-5047, USA
e-mail: debby_keller@hotmail.com

C. P. Delaney
e-mail: Conor.Delaney@uhhospitals.org

Z. Khorgami
Department of Surgery, Tehran University of Medical Sciences, Tehran, Iran

B. Swendseid
School of Medicine, Case Western Reserve University, Cleveland, OH, USA

quality indicator in surgery [2, 3]. To date, readmissions have not been able to be predicted from the postoperative course [4]. Previous work has attempted to identify predictors of readmission; distal bowel resection, benign diagnosis, young age and old age, more comorbidities, social deprivation, surgical field contamination, longer operative times, hemoglobin levels <12 g/dl, and absence of air testing of a colorectal anastomosis were all found to be related to readmissions [5–7]. These variables have not been consistent or used to enact change and improve outcomes.

In previous work, we found the ileostomy reversal subgroup to be a source of higher readmissions, with a 30-day readmission rate of 12.4 %, versus our overall readmission rate of 5.5 % [8]. Ileus/small-bowel obstruction was the most common cause for readmission. Readmissions had a median length of stay (LOS) of 4 days, and more patients required home care services or temporary skilled nursing after discharge from the readmission episode-all significant sources of healthcare utilization. The next logical step would be to find the causes for the readmission problem in this group.

Our objective was to identify factors related to readmission in ileostomy reversal patients. By identifying these factors, we could develop interventions to identify these high-risk patients prospectively and alter discharge criteria to reduce unnecessary readmissions and improve healthcare utilization.

Materials and methods

After obtaining Institutional Review Board approval, review of a prospective department database was performed from August 2006 to August 2012 to identify patients who underwent an ostomy reversal. The patients were identified by current procedural terminology (CPT) code (44620, 44625, 44626, 44227, and 44320) and considered for evaluation. The ostomy reversal had to be the primary procedure for the episode of care for inclusion. Patients younger than age 18 years and patients with incomplete medical records cases were excluded from the study. Patients were stratified into nonreadmitted and readmitted within 30 days of the ostomy reversal. All cases followed a well-implemented standardized ERP and discharge criteria [9–12]. Preoperative, perioperative, and postoperative factors for the ostomy reversal admission were analyzed. Additional demographic and clinical information was supplemented from the electronic medical records. Data fields evaluated included age, gender, body mass index (BMI), comorbidities, procedure type, procedure indication, LOS, operative time, blood loss, intraoperative complications, postoperative complications, need for intensive care unit (ICU) care, total cost of care for the hospital episode, and discharge disposition. The main outcome measures were predictors of readmission and characteristics of patients readmitted and not readmitted.

Closure techniques

All closures were performed under general anesthesia. For all ileostomy closures, a circumferential peristomal incision was made and deepened down to the fascia. The fascia was mobilized off the small bowel. The small bowel was adequately mobilized to return the ileostomy closure site to the abdominal cavity. The stoma was everted and the edges freshened. Depending on the operating surgeon's preference, the bowel was then either closed transversely with interrupted sutures or resected with a side-side stapled anastomosis.

For loop colostomy closures, the same peristomal mobilization was performed. For end colostomy closures, a circular stapler anvil was inserted into the distal end of colon. Then, either laparoscopically (through a 12-mm port at the stoma site, a 10-mm port at the umbilicus for the camera, and 5-mm working ports in the right iliac and right upper quadrant) or through a midline laparotomy, the small bowel and omentum were moved towards right upper quadrant. Adhesiolysis was performed as needed to identify the rectal stump. Lateral mobilization of the left colon and splenic flexure, then a medial to lateral mobilization of the sigmoid colon off of Gerota's fascia, were performed to allow tension-free reach of colon to rectum. The proximal rectum was mobilized until free, then a circular stapled anastomosis completed and leak test performed.

Data analysis was performed using unpaired Student's t test, χ^2 test, or Fisher exact test, as appropriate, with a significance level defined as $p = 0.05$. Univariate logistic regression models were built to estimate the odds of readmission for all variables. Multivariate logistic regression was performed to determine which significant factors from the univariate analysis significantly impacted readmission. All analysis was performed using SPSS (v18.0).

Results

During the study period, 351 patients had ostomy reversals and met inclusion criteria. The case classes were 345 elective (98.3 %) and 6 emergent (1.7 %). Total patients were 186 males (53 %) and 165 females (47 %). The main indications for the index case were rectal cancer (33.9 %) and inflammatory bowel disease (21.7 %). Of the 351 cases, 302 (86 %) were ileostomy and 49 (14 %) were colostomy reversals. Fifty-two cases were end ostomy reversals (14.8 %), and 299 were loop ostomy reversals

Table 1 Patient demographic data

Characteristics	Nonreadmitted ($n = 307$)	Readmitted ($n = 44$)	p value
Type of stoma			<0.001
Ileostomy	272 (88.6 %)	30 (68.2 %)	
Colostomy	35 (11.4 %)	14 (31.8 %)	
Age, mean (SD)	55.4 (17.5)	59.5 (17.1)	0.077
BMI, mean (SD)	27.6 (6.7)	27.8 (8.2)	0.891
Gender (male, %)	159 (51.8 %)	27 (61.4 %)	0.234
ASA class			0.191
I	4 (1.3 %)	1 (2.3 %)	
II	113 (36.8 %)	9 (20.5 %)	
III	186 (60.6 %)	33 (75 %)	
IV	4 (1.3 %)	1 (2.3 %)	
Charlson Comorbidity Index, mean (SD)	1.8 (1.7)	2.2 (1.9)	0.345
Modified Frailty Index, mean (SD)	0.81 (0.88)	0.91 (1.04)	0.610
Indication for index operation			0.416
Benign and malignant anal disorders	7 (2.3 %)	2 (4.5 %)	
Colon cancer	29 (9.4 %)	4 (9.1 %)	
Rectal cancer	107 (34.9 %)	12 (27.3 %)	
Diverticulitis	60 (19.5 %)	7 (15.9 %)	
Inflammatory bowel disease	67 (21.8 %)	9 (20.5 %)	
Dysmotility/constipation	5 (1.6 %)	0 (0 %)	
Infectious/ischemic colitis	10 (3.3 %)	2 (4.5 %)	
Other malignancies[a]	10 (3.3 %)	4 (9.1 %)	
Other[b]	12 (3.9 %)	4 (9.1 %)	
Time to reversal, months (mean, SD)	29.9 (23)	34.6 (24.1)	0.238
Time to reversal, months (median, range)	24 (2–86)	27.5 (2–81)	

BMI body mass index, *ASA* American Society of Anesthesiologists

[a] Other malignancies includes prostate, bladder, uterus, cervix, endometrium, vulvar, and retroperitoneal sarcoma

[b] Other includes benign gynecologic disorders, iatrogenic injuries, trauma, necrotizing fasciitis, and volvulus

(85.2 %). Twenty-one ostomy closures were performed laparoscopically (6 %); the majority of closures were performed through an open approach (94 %). All laparoscopic cases were end ostomies. There were six total intraoperative complications (1.7 %): two bleedings, two stapler malfunctions, one anastomotic leak test failure, and one rectal serosal tear. Five patients (1.4 %) required an ICU stay after the ostomy reversal. The median LOS was 3 days (range 1–59). At discharge, 339 patients (96.6 %) were discharged home, whereas 12 (3.4 %) required temporary nursing care. After a median follow-up of 24 months (range 2–86), the median time to ostomy reversal was 2.5 months (Table 1).

Forty-four were readmitted within 30 days of ostomy reversal, a readmission rate of 12.5 %. Comparing readmitted and nonreadmitted patients, there were no significant differences across demographic factors of age, BMI, gender, or comorbidities, as demonstrated by comparable American Society of Anesthesiologists class, the Modified Frailty Index, and Charlson Comorbidity Indexes. Readmitted and nonreadmitted patients had similar indications for the index operation and time to ostomy reversal (Table 1).

Readmitted had significantly longer operative times ($p = 0.002$), intraoperative blood loss ($p = 0.003$), and intraoperative complications ($p = 0.005$). More readmitted patients required ICU care after the ostomy reversal ($p \leq 0.0001$). LOS for the ostomy reversal was significantly longer for readmitted patients ($p = 0.001$); 61.4 % of readmitted patients had delayed discharge ($\geq$3 days). At discharge, significantly more nonreadmitted patients were discharged home without need for home care or skilled nursing services ($p < 0.001$). Total hospital costs for the ostomy reversal episode for significantly higher for readmitted than nonreadmitted patients ($22,048 vs. $12,526, respectively; $p = 0.0162$). All readmitted patients had postoperative complications, compared with only 5.5 % of nonreadmitted patients ($p < 0.0001$). The most common complication in both groups was small-bowel obstruction/postoperative ileus (36.4 % readmitted vs. 5.5 % nonreadmitted; $p < 0.0001$). Eleven readmitted patients required an unplanned intervention during readmission (25 %): five interventional radiology drainage procedures, three exploratory laparotomies, with lysis of adhesion, two exploratory laparotomies with bowel resection and recreation of the ostomy, and one therapeutic endoscopy.

Table 2 Stoma reversal perioperative and short-term outcome data

Characteristics	Nonreadmitted ($n = 307$)	Readmitted ($n = 44$)	p value
Operation category			0.005
Elective	304 (99 %)	41 (93.2 %)	
Emergent	3 (1 %)	3 (6.8 %)	
Operative time (min), mean (SD)	84.8 (50.3)	128.6 (88.1)	0.002
Operative time (min), median (range)	70 (31–307)	94.5 (39–320)	
Blood loss (ml), mean (SD)	29 (64)	80 (154)	0.003
Blood loss (ml), median (range)	15 (0–500)	25 (0–800)	
Intraoperative complications	3 (1 %)	3 (6.8 %)	0.005
Length of stay (days), mean (SD)	3.9 (3.6)	8.4 (10.3)	0.001
Length of stay (days), median (range)	3 (1–32)	6 (1–59)	
Delayed discharge (≥3 days)	107 (34.8 %)	27 (61.4 %)	0.001
ICU stay	1 (0.3 %)	4 (9.1 %)	<0.0001
Discharge disposition (*n*, %)			
Home	302 (98.4 %)	35 (79.5 %)	<0.0001
Home care	1 (0.3 %)	1 (2.3 %)	
SNF/rehabilitation center	4 (1.3 %)	8 (18.2 %)	
Postoperative complications (*n*, %)	17 (5.5 %)	44 (100 %)	<0.0001
Small-bowel obstruction/ileus	12 (3.9 %)	16 (36.4 %)	<0.0001
Dehydration	1 (0.3 %)	7 (15.9 %)	<0.0001
Gastrointestinal bleeding	0 (0 %)	5 (11.4 %)	<0.0001
Wound infection	3 (1 %)	5 (11.4 %)	<0.0001
Intraabdominal collection	1 (0.3 %)	4 (9.1 %)	<0.0001
Enterocutaneous fistula	0 (0 %)	3 (6.8 %)	<0.0001
Anastomosic leak	0 (0 %)	2 (4.5 %)	<0.0001
Cardiovascular	2 (0.7 %)	0 (0 %)	0.591
Thromboembolic	1 (0.3 %)	0 (0 %)	0.705
Other[a]	0 (0 %)	8 (18.2 %)	<0.0001
Unplanned reoperation (*n*, %)	0	11 (25.0 %)	0.001
Mean total hospital costs, U.S. $ (SD)	$12,527 ($7,950)	$22,048 ($13,230)	<0.0001
Mean total margin, U.S. $ (SD)	$3,386 ($8,640)	$335 ($11,264)	<0.0001

ICU intensive care unit, *SNF* skilled nursing facility

[a] Includes wound dehiscence, wound hematoma, pancreatitis, cholecystitis, infected PICC line, pneumonia, *Clostridium colitis*, volume overload

Perioperative and short-term patient outcomes are seen in Table 2.

With the logistic regression model, we found that longer operative time [odds ratio (OR) 1.006, 95 % confidence interval (CI) 1.001–1.012], intraoperative complications (OR 7.334, 95 % CI 1.23–43.761), ICU stay (OR 1.291, 95 % CI 1.18–1.893), delayed discharge (OR 1.085, 95 % CI 1.003–1.173), and discharge to a skilled nursing facility (OR 6.936, 95 % CI 1.531–31.332) were independent predictors of readmissions (Table 3). In subgroup analysis, there were no significant differences between ileostomy and colostomy outcomes, and ostomy type was not a predictor of readmission after ostomy reversal.

Discussion

In this study, we found that readmitted and nonreadmitted ostomy reversal patients have similar demographic profiles and comorbidities. However, the two groups have significantly different perioperative and short-term outcome variables, including greater operative time, intraoperative complications, need for ICU care postoperatively, delayed discharge, and the need for home care or skilled nursing services.

Extensive prior research has focused on the complications and subsequent readmissions after ileostomy *creation* [13–18]. Few studies have described readmission rates

Table 3 Multivariate logistic regression model for predictors of readmission

Predictor	OR (95 % CI)	*p* Value
Age	0.988 (0.964–1.013)	0.352
Type of stoma (colostomy vs. ileostomy)	1.059 (0.307–3.595)	0.938
Intraoperative blood loss	1.002 (0.997–1.006)	0.530
Operation category	0.262 (0.027–2.53)	0.247
Operative time	1.006 (1.001–1.012)	0.029
Intraoperative complication	7.334 (1.23–43.761)	0.029
ICU stay	1.291 (1.18–1.893)	0.191
Delayed discharge (≥3 days LOS)	1.085 (1.003–1.173)	0.041
Discharge to SNF/rehabilitation center	6.936 (1.531–31.332)	0.012

OR odds ratio, *CI* confidence interval, *LOS* length of stay, *SNF* skilled nursing facility, *ICU* intensive care unit

after ostomy closure. Published rates are between 10 and 12 %; however, these studies have all focused on ileostomy reversals [19–24]. Our study evaluated ileostomy and colostomy reversals, a strength over previous work. We found the type of stoma had no effect on readmission (OR 1.059, 95 % CI 0.307–3.595; $p = 0.938$). Previous studies have demonstrated that early discharge was feasible [20–22]. Our results show that early discharge is not only feasible but associated with fewer readmissions; delayed discharge was independently predictive of a postoperative readmission (OR 1.085, 95 % CI 1.003–1.173).

Even fewer studies have attempted to determine factors related to complications and readmissions after ostomy reversal. Increased length of time between ileostomy formation and closure was suggested as a factor responsible for postoperative small-bowel obstruction [23]. Conversely, a longer wait from loop ileostomy creation to closure was shown significantly related to complications requiring readmission and surgical intervention (140 vs. 210 days, $p < 0.0001$) [25]. When attempting to identify predictors of postoperative complications colostomy (Hartmann) reversal patients during 7-year period, Lin et al. found that BMI was an independent predictor of morbidity ($p < 0.04$); the authors recommended weight loss to improve outcomes [26]. We identified independent contributors to unnecessary readmissions. Patients with longer operative times, intraoperative complications, and ICU stays can be prospectively identified at high risk for readmission, allowing changes to our ERP. In additional, in patients who require LOS longer than 3 days or skilled nursing at discharge, the discharge criteria and postoperative follow-up can be amended to potentially reduce the 12.5 % readmission rate in this cohort.

With the ability to identify patients at risk for readmission, we can prospectively modify our discharge and follow-up protocols. For example, adding a telephone call to this patient population before the first scheduled postoperative follow-up visit to assess bowel function, abdominal pain, and hydration may be beneficial; future prospective studies will be needed to assess the impact of this change.

We do recognize limitations of this study. The design is a retrospective database review and subject to the biases associated with retrospective studies, as well as limitations in the data available for analysis. It is a single-institution study, so our results may not be generalizable. There also was a relatively small sample size of readmitted patients, so any further subgroup analysis could be underpowered and subject to a Type II error. Regardless of any limitations, the study highlights an issue that affects patient outcomes and healthcare resources and deserves further attention in the current literature.

In conclusion, readmitted and nonreadmitted patients have similar demographics and comorbidities. However, the perioperative and short-term outcomes are significantly different. Longer operative procedure times, intraoperative complications, ICU admissions, need skilled nursing at discharge, and delayed discharge were all predictive of readmission after ostomy reversal. These factors can be used to prospectively identify patients more likely to be readmitted, and modify discharge and follow-up protocols to reduce unnecessary readmissions.

Disclosures Drs. Keller, Khorgami, Khan, Delaney, and Mr. Swendseid have no conflict of interest or financial ties to disclose.

References

1. Schneider EB, Hyder O, Brooke BS, Efron J, Cameron JL, Edil BH, Schulick RD, Choti MA, Wolfgang CL, Pawlik TM (2012) Patient readmission and mortality after colorectal surgery for colon cancer: impact of length of stay relative to other clinical factors. J Am Coll Surg 214(4):390–398 discussion 398–399
2. Wick EC, Shore AD, Hirose K, Ibrahim AM, Gearhart SL, Efron J, Weiner JP, Makary MA (2011) Readmission rates and cost following colorectal surgery. Dis Colon Rectum 54(12): 1475–1479
3. Centers for Medicare and Medicaid Readmissions Reduction Program (2012) http://cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Readmissions-Reduction-Program.html/. Accessed 2 Aug 2013
4. Azimuddin K, Rosen L, Reed JF, Stasik JJ, Riether RD, Khubchandani IT (2001) Readmissions after colorectal surgery cannot be predicted. Dis Colon Rectum 44(7):942–946
5. Guinier D, Mantion GA, Alves A, Kwiatkowski F, Slim K, Panis Y (2007) Risk factors of unplanned readmission after colorectal surgery: a prospective, multicenter study. Dis Colon Rectum 50(9):1316–1323
6. Faiz O, Haji A, Burns E, Bottle A, Kennedy R, Aylin P (2011) Hospital stay amongst patients undergoing major elective colorectal surgery: predicting prolonged stay and readmissions in NHS hospitals. Colorectal Dis 13(7):816–822

7. Kelly M, Sharp L, Dwane F, Kelleher T, Comber H (2012) Factors predicting hospital length-of-stay and readmission after colorectal resection: a population-based study of elective and emergency admissions. BMC Health Serv Res 12:77
8. Keller DS, Swendseid B, Khan S, Delaney CP (2013) Readmissions after ileostomy closure: cause to revisit a standardized enhanced recovery pathway? Am J Surg (in press)
9. Delaney CP, Kiran RP, Senagore AJ, Brady K, Fazio VW (2003) Case-matched comparison of clinical and financial outcome after laparoscopic or open colorectal surgery. Ann Surg 238(1):67–72
10. Adamina M, Kehlet H, Tomlinson GA, Senagore AJ, Delaney CP (2011) Enhanced recovery pathways optimize health outcomes and resource utilization: a meta-analysis of randomized controlled trials in colorectal surgery. Surgery 149(6):830–840
11. Delaney CP (2008) Outcome of discharge within 24–72 h after laparoscopic colorectal surgery. Dis Colon Rectum 51(2): 181–185
12. Delaney CP, Brady K, Woconish D, Parmar SP, Champagne BJ (2012) Towards optimizing perioperative colorectal care: outcomes for 1,000 consecutive laparoscopic colon procedures using enhanced recovery pathways. Am J Surg 203(3):353–355 discussion 355–356
13. Hayden DM, Pinzon MC, Francescatti AB, Edquist SC, Malczewski MR, Jolley JM, Brand MI, Saclarides TJ (2013) Hospital readmission for fluid and electrolyte abnormalities following ileostomy construction: preventable or unpredictable? J Gastrointest Surg 17(2):298–303
14. Messaris E, Sehgal R, Deiling S, Koltun WA, Stewart D, McKenna K, Poritz LS (2012) Dehydration is the most common indication for readmission after diverting ileostomy creation. Dis Colon Rectum 55(2):175–180
15. Beck-Kaltenbach N, Voigt K, Rumstadt B (2011) Renal impairment caused by temporary loop ileostomy. Int J Colorectal Dis 26(5):623–626
16. Bax TW, McNevin MS (2007) The value of diverting loop ileostomy on the high-risk colon and rectal anastomosis. Am J Surg 193(5):585–587 discussion 587–588
17. Rullier E, Le Toux N, Laurent C, Garrelon JL, Parneix M, Saric J (2001) Loop ileostomy versus loop colostomy for defunctioning low anastomoses during rectal cancer surgery. World J Surg 25(3):274–277 discussion 277–278
18. Wexner SD, Taranow DA, Johansen OB, Itzkowitz F, Daniel N, Nogueras JJ, Jagelman DG (1993) Loop ileostomy is a safe option for fecal diversion. Dis Colon Rectum 36(4):349–354
19. Williams LA, Sagar PM, Finan PJ, Burke D (2008) The outcome of loop ileostomy closure: a prospective study. Colorectal Dis 10(5):460–464
20. Kalady MF, Fields RC, Klein S, Nielsen KC, Mantyh CR, Ludwig KA (2003) Loop ileostomy closure at an ambulatory surgery facility: a safe and cost-effective alternative to routine hospitalization. Dis Colon Rectum 46(4):486–490
21. Ihedioha U, Muhtaseb S, Kalmar K, Donnelly L, Muir V, Macdonald A (2010) Closure of loop ileostomies: is early discharge safe and achievable? Scott Med J 55(1):27–29
22. Joh YG, Lindsetmo RO, Stulberg J, Obias V, Champagne B, Delaney CP (2008) Standardized postoperative pathway: accelerating recovery after ileostomy closure. Dis Colon Rectum 51(12):1786–1789
23. Wong KS, Remzi FH, Gorgun E, Arrigain S, Church JM, Preen M, Fazio VW (2005) Loop ileostomy closure after restorative proctocolectomy: outcome in 1,504 patients. Dis Colon Rectum 48(2):243–250
24. Baraza W, Wild J, Barber W, Brown S (2010) Postoperative management after loop ileostomy closure: are we keeping patients in hospital too long? Ann R Coll Surg Engl 92(1):51–55
25. Mansfield SD, Jensen C, Phair AS, Kelly OT, Kelly SB (2008) Complications of loop ileostomy closure: a retrospective cohort analysis of 123 patients. World J Surg 32(9):2101–2106
26. Lin FL, Boutros M, Da Silva GM, Weiss EG, Lu XR, Wexner SD (2013) Hartmann reversal: obesity adversely impacts outcome. Dis Colon Rectum 56(1):83–90