

89207_Auto_Edited.docx

Name of Journal: *World Journal of Gastrointestinal Surgery*

Manuscript NO: 89207

Manuscript Type: ORIGINAL ARTICLE

Clinical Trials Study

Early postoperative complications after transverse colostomy closure, a retrospective study

Complications after transverse colostomy closure

Fei Liu, Xiao-Juan Luo, ⁵Zi-Wei Li, Xiao-Yu Liu, Xu-Rui Liu, Quan Lv, Xin-Peng Shu, Wei Zhang, Dong Peng

Abstract

BACKGROUND

Background Ostomy is a common surgery usually performed to protect patients from clinical symptoms caused by distal anastomotic leakage after colorectal cancer (CRC) surgery and perforation or to relieve intestinal obstruction.

AIM

Purpose The current study was conducted to analyze the complications after transverse colostomy closure.

METHODS

Methods Patients who underwent transverse colostomy closure from Jan 2015 to Jan 2022 were retrospectively enrolled in a signal clinical center. The differences between the complication group and the no complication group were compared. Logistic regression analyses were conducted to find independent factors for overall complications or incision infection.

RESULTS

Results A total of 102 patients who underwent transverse colostomy closure were enrolled in the current study. Seventy (68.6%) patients underwent transverse colostomy because of colorectal cancer (CRC) related causes. Postoperative complications occurred in 30 (29.4%) patients and the most frequent complication occurring after transverse colostomy closure was incision infection (46.7%). The complication group had longer hospital stays ($p < 0.01$). However, no potential risk factors were identified for overall complications and incision infection.

CONCLUSION

Conclusion The most frequent complication occurring after transverse colostomy closure surgery in our center was incision infection. The operation time, interval from transverse colostomy to reversal, and method of anastomosis might have no impact on the postoperative complications. Surgeons should pay more attention to aseptic techniques.

Key Words: transverse colostomy closure; surgery; complications

Liu F, Luo XJ, Li ZW, Liu XY, Liu XR, Lv Q, Shu XP, Zhang W, Peng D. Early postoperative complications after transverse colostomy closure, a retrospective study. *World J Gastrointest Surg* 2024; In press

Core Tip: The current study was conducted to analyze the complications after transverse colostomy closure. A total of 102 patients who underwent transverse colostomy closure were enrolled in the current study. The complication group had longer hospital stay. However, no potential risk factor was identified for overall complications and incision infection. The most frequent complication occurring after transverse colostomy closure surgery in our center was incision infection. Operation

time, interval from transverse colostomy to reversal and methods of anastomosis might have no impact on the postoperative complications. Surgeons should pay more attention to aseptic techniques.

INTRODUCTION

Introduction

Ostomy is a common surgery usually performed to protect patients from clinical symptoms caused by distal anastomotic leakage after colorectal cancer (CRC) surgery and perforation or to relieve intestinal obstruction¹⁻³. Given the convenience and validity of preventing anastomotic leakage, some experts have also suggested performing prophylactic ostomy⁴⁻⁷. A temporary stoma was usually recommended to be reversed at nearly 3 months after primary surgery⁸⁻⁹. However, several studies have reported a high rate of complications after ostomy closure, especially surgical site infections, with the highest rate reaching 40%¹⁰. Postoperative complications can lengthen hospital stays and cause heavy financial burdens, and severe complications can lead to death¹¹⁻¹². For better management of complications, several risk factors for complications have been reported, such as the interval from ostomy to reversal, operation time, blood transfusion and stapled anastomosis¹³⁻¹⁷.

Previous studies have compared the incidence of postoperative complications between ileostomy and colostomy closure and found that patients who underwent colostomy closure were more likely to suffer from complications¹⁸⁻²⁰. Most studies reporting complications after colostomy closure were conducted at the end of the last century, and the sample sizes were relatively small²¹⁻²³. Furthermore, which factors, such as the time to stoma closure, affect the incidence of complications remains controversial²⁴⁻²⁶.

Currently, colostomy, especially transverse colostomy, is still a commonly used type of ostomy. As a result, the purpose of the current study was to analyse complications after transverse colostomy closure and identify relevant risk factors for complications.

MATERIALS AND METHODS

Materials and methods

Patients

Patients who underwent transverse colostomy closure surgery from Jan 2015 to Jan 2022 at a signal clinical centre were retrospectively enrolled. The ethics committee of the First Affiliated Hospital of Chongqing Medical University approved this study (number 2022-135-2), and all patients signed informed consent forms. This study was conducted in accordance with the World Medical Association Declaration of Helsinki.

Inclusion and exclusion criteria

Patients who underwent transverse colostomy closure surgery for different diseases were included in this study ($n = 140$). The exclusion criteria were as follows: 1, incomplete clinical records ($n = 15$); 2, patients who had distant metastasis ($n = 22$); and 102 patients enrolled in this study. (Figure 1)

Surgical procedure

The skin and subcutaneous tissue were first incised along the stoma margin, after which the colon was dissociated from the abdominal wall, the scar tissue around the stoma margin was removed, and the bowel was trimmed. Next, the two ends of the stoma were anastomosed with an anastomosis. Finally, the abdominal wall incision was sutured intermittently with silk threads. (Figure 2)

Data collection

The clinical characteristics included age, sex, body mass index (BMI), smoking status, drinking status, hypertension, type 2 diabetes mellitus (T2DM), preoperative haemoglobin, preoperative albumin, interval from transverse colostomy to reversal, method of anastomosis, operation time, blood loss, hospital stay, cause of transverse colostomy and complications were obtained from the electronic medical record system. Postoperative complications were classified on the basis of the Clavien–Dindo classification²⁷.

Statistical analysis

Continuous variables are expressed as the mean \pm standard deviation (SD), and an independent sample t test was used to compare the differences between the complication group and the no complication group. Categorical variables are expressed as absolute values and percentages, and the chi-square test or Fisher's exact test was used. Logistic regression analyses were also conducted to identify independent factors for overall complications and incisional infection. The data were analysed using SPSS (version 22.0) statistical software. A bilateral p value < 0.05 was considered to indicate statistical significance.

RESULTS

Results

Baseline characteristics of included patients

⁴ A total of 102 patients who underwent colostomy closure surgery were enrolled in the current study. The average age of those patients was 57.7 years. Sixty-one (59.8%) patients were males, and 40 (40.2%) patients were females. Postoperative complications occurred in 30 (29.4%) patients. More information is provided in Table 1.

In terms of the causes of transverse colostomy, 70 (68.6%) patients underwent surgery because of CRC-related causes, including anastomotic leakage after CRC surgery (32.4%), prophylactic transverse colostomy after CRC surgery (29.4%), and obstruction of CRC (3.9%). Other related causes involved perforation because of trauma (15.7%), obstruction (6.8%) and so on. (Table 2)

The most frequent complication occurring after colostomy closure surgery was incision infection (46.7%), followed by pulmonary infection (13.3%), ileus (13.3%), anastomotic leakage (10%), abdominal infection (10%), and bleeding (6.7%). Moreover, 4 (13.3%) patients had complications \geq grade III (requiring surgical, endoscopic or radiological intervention), including severe ileus (6.6%) and anastomotic leakage (6.6%). (Table 3)

Comparison between the complication group and the no complication group

The complication group had longer hospital stays ($p < 0.01$). However, there were no differences in terms of the method of anastomosis ($P = 0.63$), preoperative haemoglobin concentration ($P = 0.32$), preoperative albumin concentration ($P = 0.17$), operation time ($P = 0.69$), blood loss ($P = 0.61$) or other characteristics ($p > 0.05$). (Table 4)

Logistic regression of overall complications and incisional infection

Univariate logistic regression analysis was also conducted to identify potential risk factors for overall complications and incision infection. However, no potential risk factors were identified in this study ($p > 0.05$). (Table 5)

DISCUSSION

Discussion

In this study, a total of 102 patients who underwent transverse colostomy closure surgery were enrolled. Postoperative complications occurred in 30 (29.4%) patients. The most frequent complication occurring after colostomy closure surgery was incision infection, with an incidence of 13.7%. The complication group had longer hospital stays than did the no complication group. Furthermore, logistic regression analyses included factors such as operation time, interval from transverse colostomy to reversal, and method of anastomosis; however, no potential risk factors were identified for overall complications or incision infection.

Previous studies have reported complications after transverse colostomy closure surgery. Aston CM *et al* enrolled 100 patients who had a temporary transverse loop colostomy closed between 1969 and 1982; they found that the most frequent complication was faecal fistula (10%) and stressed that closing the stoma within 3 wk was as safe as closing it within 8 wk²⁴. Henry MM *et al* reported that fistula formation at the site of closure was the most frequent complication²¹. However, with the development of surgical techniques and clinical management, the incidence of complications in recent years has changed. Pokorny H *et al* and Rullier E *et al* reported that wound infection was the most frequent complication, with incidences of 9.0% and

8.9%^{16,18}, respectively, which was in accordance with our studies. In our study, the incidence of incision infection was 13.7%. Although incisional infection after transverse colostomy closure is usually not life-threatening, it increases the cost of hospitalization and pain of patients. Gonzalez DO *et al* reported that age, operation time, and cardiac risk factors were found to be independent risk factors for surgical site infection²⁸; however, our study did not identify any risk factors, possibly because of the relatively small sample size. More measures should be taken to decrease the incidence of incision infection, including better management of T2DM, purse-string skin closure, an open incision, and a large surgeon volume^{26,29-30}.

Although the complication group had longer hospital stays, no significant differences were found in terms of the method of anastomosis, operation time or other characteristics, and no risk factors were found. These findings prompted us to further investigate the possible reasons for complications, such as the experience of surgeons and surgical techniques.

The interval from ostomy to reversal was the most common risk factor for postoperative complications, but this topic remains controversial. In 2019, Krebs B reported that the time to stoma closure was an independent risk factor for complications after diverting stoma closure, and the optimal cut-off was 240 days²⁵. Conversely, a meta-analysis of 7 randomized controlled trials demonstrated that early stoma closure (4 wk) was as safe as routine surgery (8 wk)³¹. Pokorny H *et al* and Aston CM *et al* reported that the interval was not an independent predictor of complications^{16,24}. Because stoma closure was performed at different times, the conclusions might vary. Our study showed that the interval (ranging from 1.2-14 months) from transverse colostomy closure to reversal did not seem to influence the incidence of complications. The conclusion above might indicate that the time to perform transverse colostomy closure should be individualized and adjusted for various reasons, such as chemotherapy, primary disease, and complications after primary surgery.

To our knowledge, this is the first study to analyse postoperative complications and predictors, especially for patients who underwent transverse colostomy closure. Although several studies have reported complications after stoma closure and relevant risk factors, they did not separate ileostomy closure from colostomy closure. Because of the greater incidence of complications after colostomy closure than after ileostomy, the current study was necessary.

Some limitations of our study should be considered. First, the retrospective nature of the single-centre study indicated unavoidable selection bias. Second, only 102 patients were enrolled in this study, which was a small sample size. Moreover, additional parameters need to be included to identify risk factors. Thus, further multicentre prospective studies with large sample sizes are needed.

CONCLUSION

In conclusion, the most frequent complication occurring after colostomy closure surgery was incision infection. The operation time, interval from transverse colostomy to reversal, and method of anastomosis might have no impact on postoperative complications.

ARTICLE HIGHLIGHTS

Research background

Ostomy is a common surgery usually performed to protect patients from clinical symptoms caused by distal anastomotic leakage after colorectal cancer (CRC) surgery and perforation or to relieve intestinal obstruction. Given the convenience and validity of preventing anastomotic leakage, some experts have also suggested performing prophylactic ostomy. A temporary stoma was usually recommended to be reversed at nearly 3 months after primary surgery. However, several studies have reported a high rate of complications after ostomy closure, especially surgical site infections, with the highest rate reaching 40%. Postoperative complications can lengthen hospital stays and cause heavy financial burdens, and severe complications can lead to death. For

better management of complications, several risk factors for complications have been reported, such as the interval from ostomy to reversal, operation time, blood transfusion and stapled anastomosis.

Previous studies have compared the incidence of postoperative complications between ileostomy and colostomy closure and found that patients who underwent colostomy closure were more likely to suffer from complications. Most studies reporting complications after colostomy closure were conducted at the end of the last century, and the sample sizes were relatively small. Furthermore, which factors, such as the time to stoma closure, affect the incidence of complications remains controversial. Currently, colostomy, especially transverse colostomy, is still a commonly used type of ostomy. As a result, the purpose of the current study was to analyse complications after transverse colostomy closure and identify relevant risk factors for complications.

Research motivation

The current study was conducted to analyze the complications after transverse colostomy closure.

Research objectives

Currently, colostomy, especially transverse colostomy, is still a commonly used type of ostomy.

Research methods

Patients who underwent transverse colostomy closure from Jan 2015 to Jan 2022 were retrospectively enrolled in a signal clinical center. ³ The differences between the complication group and the no complication group were compared. Logistic regression analyses were conducted to find independent factors for overall complications or incision infection.

Research ¹results

A total of 102 patients who underwent transverse colostomy closure were enrolled in the current study. Seventy (68.6%) patients underwent transverse colostomy because of colorectal cancer (CRC) related causes. Postoperative complications occurred in 30 (29.4%) patients and the most frequent complication occurring after transverse colostomy closure was incision infection (46.7%). The complication group had longer hospital stays ($p < 0.01$). However, no potential risk factors were identified for overall complications and incision infection.

Research conclusions

The most frequent complication occurring after transverse colostomy closure surgery in our center was incision infection. The operation time, interval from transverse colostomy to reversal, and method of anastomosis might have no impact on the postoperative complications. Surgeons should pay more attention to aseptic techniques.

Research perspectives

The study will conduct to analyze the overall survival after transverse colostomy closure.

ORIGINALITY REPORT

4%

SIMILARITY INDEX

PRIMARY SOURCES

| | | |
|---|---|---------------|
| 1 | www.hindawi.com Internet | 23 words — 1% |
| 2 | bmccancer.biomedcentral.com Internet | 21 words — 1% |
| 3 | www.frontiersin.org Internet | 18 words — 1% |
| 4 | www.ncbi.nlm.nih.gov Internet | 16 words — 1% |
| 5 | Lian-Shuo Li, Xiao-Juan Luo, Xin-Peng Shu, Zi-Wei Li et al. " Quality and educational content of and short videos on early screening of rectal cancer ", JGH Open, 2023 Crossref | 13 words — 1% |

EXCLUDE QUOTES ON
EXCLUDE BIBLIOGRAPHY ON

EXCLUDE SOURCES < 1%
EXCLUDE MATCHES < 10 WORDS