

Anastomotic leakage with abscess after laparoscopic sleeve gastrectomy for obesity: report of a series and review of literature

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Ther Adv Gastrointest Endosc

2020, Vol. 13: 1–6

DOI: 10.1177/
2631774520925963

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Abstract: Anastomotic leakage with abscess is a rare but severe complication of bariatric surgery. However, there is currently a lack of attention regarding this complication. This study aimed to investigate the risk factors for this complication and relevant treatment strategies to call attention to this severe complication. We retrospectively reviewed the patients who were rehospitalized for anastomotic leakage with abscess after bariatric surgeries in West China Hospital of Sichuan University from November 2017 to November 2018. The clinical profiles analyzed included body mass index, body weight before and after surgery, postoperative hospital stay, diet prescriptions, treatment strategies, and outcomes. A total of six patients (two men and four women) were included. The mean baseline body mass index was 37.52 (29.84–43.37), and the mean weight was 104.95 kg (74.5–127.5). The chief complaints leading to rehospitalization were fever and dull abdominal pain. The average postoperative hospital stay was 3.3 (3–4) days, and the onset time ranged from 7 to 15 days. Finally, revision surgeries were performed in two of the six patients (33%), and they were all cured by percutaneous drainage-based treatments. The postoperative fever and abdominal pain were the signs of leakage and abscess. Similar patients should be followed up once a week for 3 weeks after bariatric surgery to facilitate the early recognition of this complication. A longer hospital stay and sufficient parenteral nutrition plus a later implementation of diet should be helpful to minimize this severe complication. Percutaneous drainage played a significant role in the treatment of these patients.

Keywords: abscess, anastomotic leakage, bariatric surgery, case series, perioperative diet

Received: 23 January 2020; revised manuscript accepted: 21 April 2020.

Introduction

As obesity increases, bariatric surgery also increases. Among the substantial risks of this type of surgery, severe infection and anastomotic leakage at the operation site are rare but serious complications. However, few articles have focused on this severe complication. Herein, we describe a series of six patients diagnosed with anastomotic leakage with abscess after bariatric surgery and discuss the risk factors and relevant treatment strategies.

Case presentation

We retrospectively reviewed the patients who were diagnosed and rehospitalized for anastomotic leakage with abscess after laparoscopic sleeve gastrectomy (LSG) for obesity in West China

Hospital of Sichuan University from November 2017 to November 2018. Finally, six patients were enrolled. They were four women and two men with an average age of 32.5 (23–49) years.

Informed consent was obtained from the patients.

Chief complaints

Fever and dull abdominal pain were the chief complaints.

History of present illness

Patients were discharged 3–4 days after bariatric surgery. The onset of fever (36.3–39°C) and dull abdominal pain (minor to intermediate degree)

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occurred from 7 to 15 days (mean: 10.8) after the surgery. They all were with steady vital signs, and no tachycardic or tachypnoeic was found.

The prescribed postoperative diet was a liquid diet on the second day after surgery, a semiliquid diet a month later, and then a full diet. However, because of the abrupt loss of appetite, all of them had only pure water within the first 3 days, followed by a liquid diet. None of them could follow the original prescription completely.

History of past illness

These patients had no relevant previous medical history.

Personal and family history

There were no relevant personal or family histories.

Physical examination upon admission

The mean baseline BMIs (body mass indices) before and after bariatric surgery were 37.52 (29.84–43.37) and 35.55 (18.65–62.43) kg/m², and the mean weights before and after surgery were 104.95 (74.5–127.5) and 98.33 (52–150) kg.

Laboratory examinations

Blood analysis revealed leukocytosis $8.5\text{--}21.95 \times 10^9/\text{L}$, with predominant neutrophils (84.9%–89.8%). Prothrombin and other biochemistry tests were normal.

Imaging examinations

The initial imaging evaluation with esophagography and computer tomography (CT) revealed the existence of leakage and abscess of the stomach. Then, percutaneous drainage tubes were placed under CT guidance (Figures 1 and 2). Gastroscopy was arranged to detect and repair the leakage when the body temperature returned to normal, and there was no more pus flowing from the drainage tubes (Figure 3).

The existence of leakage and abscess was evaluated once more before the patients were discharged from the hospital to ensure that the patients were cured.

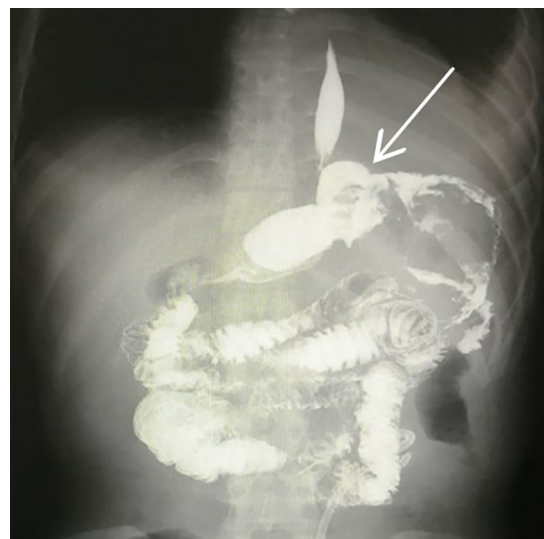


Figure 1. Leakage revealed by esophagography (arrow).

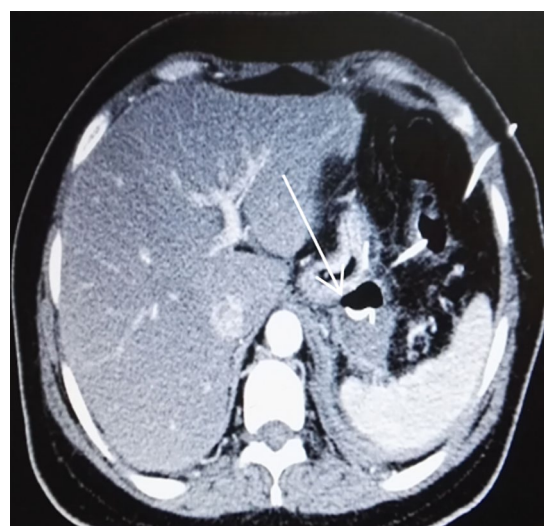


Figure 2. Percutaneous abscess drainage with a catheter placed in the lesion (arrow).

Final diagnosis

The final diagnosis in the presented case series was anastomotic leakage with abscess after sleeve gastrectomy.

The clinical characteristics are summarized in Table 1.

Treatment

For these patients, the treatments were fasting, parenteral nutrition, placement of a stomach tube, and the percutaneous drainage of the abscess.

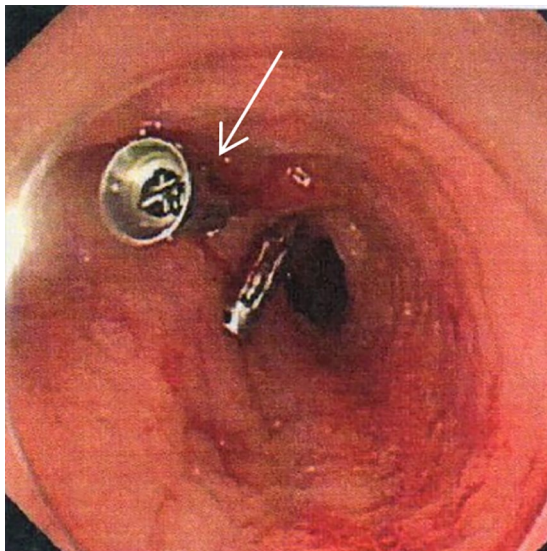


Figure 3. Fistula repair under gastroscopy (arrow).

Then, antibiotics were prescribed according to the culture results of the drainage pus. If there were no bacteria detected, antibiotics for Gram-negative bacteria were considered until there were no signs of infection and no pus outflow from the drainage tube. When there was no pus flowing from the drainage catheter, CT and esophagography were arranged. If there were no signs of leakage and abscess, we injected methylene blue into the catheter to see whether it flowed from the stomach tube or not. If it did, a longer drainage time, repair via gastroscopy, placement of a covered stent or revision surgery were considered. Otherwise, the patient was discharged from the hospital for recovery.

Outcome and follow-up

Finally, revision surgery was performed in two of the six patients (cases 1 & 6) after the percutaneous drainage, placement of a covered stent, and gastroscopy all failed to stop the leakage. These two patients (both women with ages of 49 and 23 years) had the longest rehospitalization durations, which were 225 and 81 days, respectively. Cases 2 and 3 (one woman, one man) were cured by percutaneous drainage plus gastroscopy repair. Case 4 was a young man of 32 years. He was the only one cured by purely percutaneous drainage and was discharged 6 days later. Case 5 was a 30-year-old woman. Because the leakage was too large to be repaired via gastroscopy, it took her 60 days of drainage to heal. Case 2, a woman of 28 years, gained 22.9 kg during the interval between

the two hospital stays (bariatric surgery and anastomotic leakage), which might have been the consequence of a complex pathological state of edema and surgical site infection after long time of parenteral nutrition (she had received over 2 months of parenteral nutrition before she came to our hospital). Case 6 was rehospitalized three times. The second time was on the ninth day after bariatric operation. However, the signs of leakage were neglected, and the woman was discharged after 8 days. Then, 18 months later, when she was admitted the third time, the abscess had diffused throughout the abdomen.

Finally, all six patients were cured and discharged. Follow-up revealed no signs of relapse.

Discussion

Bariatric surgery is increasing as obesity and related health problems become more prevalent.¹ There has been comprehensive evidence regarding bariatric surgery outcomes, which show it to be safe and effective.² Short-term adverse events occur at a rate as low as 0.08%. The in-hospital mortality rate is 0.07%, and the complication rate for the primary operation is 2.9%. The most common complications include vomiting/poor intake, fluid/electrolyte problems, and pneumonia and other infections. Only 1.4% of cases required revision surgery.³ According to research on bariatric surgeries, most surgeons prefer sleeve gastrectomy compared with other bariatric surgery types.⁴⁻⁸

Moreover, a study conducted in the United Kingdom found that bariatric surgery for obesity was also associated with reductions in the risk of type 2 diabetes mellitus (T2DM), angina, hypertension, myocardial infarction (MI), and obstructive sleep apnea. Some patients with T2DM and hypertension were even cured after surgery.^{2,3} This phenomenon indicates that bariatric surgery may prevent some obese people from harmful clinical outcomes in the future. Interestingly, bariatric surgery is associated with significant weight loss that is likely sustained for as long as 4 years, while nonsurgical methods of weight control have been shown to be ineffective after a follow-up of the same duration.²

As the stomach is anatomically close to the mouth, it was not surprising that most of the pathogens detected in patients with infectious complications were oral microflora, which was

Table 1. Demographic and clinical characteristics of the six patients.

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Age	49	28	33	32	30	23
Sex	F	F	M	M	F	F
Weight (before operation, kg)	74.5	104.2	127.5	115	107.5	101
Weight (anastomotic leakage diagnosed, kg)	62.5	150	115	111.5	99	52
Weight loss	12 kg	-45.8 kg	12.5 kg	3.5 kg	8.5 kg	49 kg
Weight loss/month	8	-15.3	25	7	17.4	2.7
BMI before surgery	29.84	43.37	39.20	34.72	41.8	36.21
BMI after surgery	24.41	62.43	35.49	33.66	38.67	18.65
BMI loss	5.43	-19.06	3.71	1.06	3.13	17.65
BMI loss/month	0.68	-6.35	7.42	2.12	6.26	0.98
The initial hospital stay (for surgery, days)	11	11	10	11	11	10
Postoperative hospital stay (days)	4	3	3	4	3	3
Time (between operation and leakage diagnosis)	8 months	3 months	15 days	14 days	15 days	18 months
Duration of each hospitalization: second/third (days)	225	45	25	7	60	8/81
Symptoms/onset time (days)	Fever, sudden abdominal pain/15	Fever, 3 months later abdominal pain/7	Fever, abdominal pain/14	Fever, dull abdominal pain/7	Fever, dull abdominal pain, vomiting/13	Fever and dull abdominal pain/9
Pus culture (white blood cell count)	Normal bacteria of body surface and oral (13.86×10^9)	<i>Bacillus cepacia</i> (21.95×10^9)	<i>Acinetobacter baumannii</i> (21.59×10^9)	Isthmus group streptococcus (12.01×10^9)	Isthmus group streptococcus (13.19×10^9)	No bacteria detected (6.46×10^9)
Treatment strategies	PD + RGF + CS + RS	PD + RGF	PD + RGF	PD	PD	PD + RS

BMI, body mass index; CS, covered stent; PD, percutaneous drainage; RGF, repairment of gastric fistula under gastroscope; RS, revision surgery.

also found in our cases.⁹⁻¹¹ Generally, many factors may correlate with surgical site infection, including obesity, nutritional status, diabetes, and preoperative and postoperative inpatient lengths of stay. Gastric abscesses are rare after gastric surgeries because of the strong antibacterial action of gastric acid. However, when gastric abscess occurs, the mortality rate can be as high as 37%–100%. When the fever can be alleviated, surgeons do not consider revision surgery. Medication only as a therapy is not recommended because it has been shown to be ineffective.¹²⁻¹⁴

In this study, only case 1 received a covered stent, which was ineffective. In contrast, percutaneous drainage played a significant role in curing all six patients. Case 1, who suffered the longest rehospitalization duration, had the oldest age (49 years), and the minimum preoperational BMI index (29.84), which indicates that more caution might be applied when candidates for bariatric operation are older (>40 years) and have a relatively low BMI index (<30). We also found that case 2 and case 4, who had the shortest rehospitalization durations among women and men, respectively, noted their abnormal symptoms earlier than did the other patients (within 7 days). This shows us that the earlier we recognize the complication, the faster and better the recovery the patients will achieve. As the onset time of symptoms was observed from 7 to 15 days, postoperative follow-up once a week for 3 weeks seems to be necessary. Another interesting finding was that compared with women, men recovered more quickly (mean in-hospital days: 16 vs 105). Further research is needed to determine the actual mechanism.

As a newly developed operation type, laparoscopic operation is superior in terms of smaller surgical wounds and much shorter inpatient stays compared with traditional surgery. However, it seems to not to be as accurate as traditional surgeries in every case. Staple line leakage was reported to occur in 1.5% to 3% post-LSG.^{15,16} In this study, from the patients who received revision surgeries, we found that the distance between teeth varied and where the longest tooth distance was, the leakage occurred. Therefore, more strict checking of tooth distance and additional sewing in weak areas is crucial.

When and to what degree the patients return to eating after surgery is still uncertain. It is acknowledged that adequate nutrition helps the stomach

recover from surgery; however, all six patients lost their appetite abruptly after surgery, and sufficient parenteral nutrition was not administered. Therefore, the early return to eating after bariatric surgery seems to be unpractical, and essential parenteral nutrition should not be neglected.

Theoretically, patients after bariatric surgery who suffered from malnutrition need longer hospital stays for recovery. Most patients with bariatric surgery have a relatively short postoperative stay. An investigation conducted in the United Kingdom showed that the average postoperative stay was 2.7 days, and only 3% remained in the hospital longer than 5 days.² As all the enrolled six cases who followed the guide of postoperative stay before (within 4 days) cannot avoid this severe complication, maybe selected patients should prolong their postoperative stay for safety. Further research is needed to identify these patients.

Conclusion

Overall, for most people, laparoscopic operation is safe and effective. However, we should be aware that postoperative fever and abdominal pain, even to a minor degree, may be a sign of leakage. These patients should be followed up once a week for 3 weeks after bariatric surgery. A longer hospital stay and sufficient parenteral nutrition plus a later implementation of a normal diet may help to minimize this severe complication. Percutaneous drainage played a significant role in the treatment.

Author contributions

Y.L. and N.-N. Y. acquired and analyzed the data; Y.-S. G. made critical revisions; Q.H. was responsible for the revision of the manuscript for important intellectual content; all authors issued final approval for the version to be submitted.

Conflict of interest statement

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval

It was approved by ethics committee of West China Hospital of Sichuan University/2019-921.


Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Informed consent

Informed written consent was obtained from the patient for publication of this report and any accompanying images.

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