CASE REPORT

A case of a chronic salmonella infection following Roux-en-Y gastric bypass surgery, treated successfully by a laparoscopic cholecystectomy

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SUMMARY

We report a case of chronic infection caused by *Salmonella* and cured by a laparoscopic cholecystectomy after Roux-en-Y gastric bypass (RYGB) surgery for obesity. This patient presented with a 2-year history of chronic abdominal pain, loose stools and excessive weight loss. Her stool and urine cultures were positive for *Salmonella*. Despite multiple courses of antibiotics, she remained positive.

After undergoing a laparoscopic cholecystectomy, the patient became asymptomatic and stools remained negative. In chronic carriers for *Salmonella*, the gall bladder is the common reservoir for the bacteria and removing it is usually curative.

The possibility that the source of the may be in the biliary limb of her bariatric procedure and not in the gall bladder remained a concern.

In patients who have had a RYGB, cholecystectomy is an effective treatment.

All patients presenting with abdominal symptoms following RYGB should have stool and urine cultures taken as part of their work up.

BACKGROUND

Public Health England reported nearly 8500 cases of salmonella in 2015

The gall bladder is often the reservoir in patients who remain positive, and for chronic carriers, cholecystectomy is the treatment of choice. Most carriers remain asymptomatic.¹

Following bariatric surgery in 2011, as expected this patient lost a significant amount of weight. However, in 2012, she became unwell with crampy abdominal pain, diarrhoea and episodes of vomiting and her weight reduced to 40 kg. Many of her symptoms were initially attributed to her bariatric surgery. After extensive investigations, she was found to have positive stool and urine cultures for *Salmonella* and the source of her infection was initially thought to be due to overgrowth in the biliary limb of her gastric bypass. Despite multiple courses of antibiotics, she remained symptomatic. Laparoscopic cholecystectomy was curative.

Symptoms following gastric bypass surgery including excessive weight loss and abdominal pain are well recognised. We report this unusual case of a salmonella infection causing excessive weight loss and abdominal symptoms.

We want to highlight the fact that even in patients who have had a Roux-en-Y gastric bypass (RYGB) surgery, cholecystectomy is curative for chronic salmonella infection. We also recommend that routine stool and urine cultures should be undertaken as part of the work up for these patients presenting with abdominal symptoms. To our knowledge, this is the first case reported in the English literature of salmonella infection in a patient undergoing RYGB treated successfully with a cholecystectomy.

CASE PRESENTATION

A 55-year-old woman presented with a 2-year history of chronic abdominal pain, loose stools and weight loss. She also complained of episodes of epigastric pain radiating to her back with intermittent vomiting. She was investigated by her general practitioner (GP) and an ultrasound scan (USS) of her abdomen was normal. Routine blood tests were also normal. However, urine and stool tests were positive for *Salmonella*.

She was prescribed multiple courses of antibiotics, including ciprofloxacin, trimethoprim and azithromycin. Her symptoms temporarily improved with the antibiotics but returned within days of completing each course. Her stools cultures remained positive and she continued to be very troubled with her abdominal pain and vomiting and on presentation she weighed 40 kg.

In her medical history, the patient had undergone a RYGB 24 months ago. Initially, she did well and lost a significant amount of weight. Her symptoms started 12 months postoperatively following a trip to Turkey. She also suffered with fibromyalgia, depression and chronic fatigue and had a history of alcohol excess. There was a family history of bowel cancer. She was on a number of medications including fluoxetine, lansoprazole, methadone, mirtazapine and pregabalin.

The abdominal examination was unremarkable. A repeat ultrasound showed no evidence of gallstones or ascites and a normal liver. Oesophagogastroduodenoscopy (OGD) and colonoscopy were ordered and were normal. Routine blood tests were again all normal. Initially her symptoms were attributed to her bariatric surgery and she was referred to the dieticians. She also had a history of a lumbar laminectomy, therefore, an MRI scan of her spine was undertaken

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to exclude a bony source for her salmonella infection. As her symptoms did not settle and her stools remained positive for *Salmonella*, her case was again discussed with the microbiologist and gastroenterologists. Initial concerns were that the chronic infection was from bacterial overgrowth in the biliary limb of her gastric bypass rather than her gall bladder. Despite multiple antibiotic treatments, she remained symptomatic and following further advice from the microbiologists a laparoscopic cholecystectomy was undertaken. At 12-month postoperatively, all her abdominal symptoms remain settled and she had put on weight (47 kg). Postoperative stool tests on three occasions have remained negative for *Salmonella* and she has been discharged to the GP.

INVESTIGATIONS

Recommended investigations to exclude causes of excessive weight loss and abdominal pain:

- ▶ USS of abdomen and pelvis to exclude biliary causes.
- ▶ CT scan with contrast of abdomen and pelvis to exclude internal herniation and obstruction.
- ▶ OGD to exclude gastric pathology.
- ▶ Stool cultures.

DIFFERENTIAL DIAGNOSIS

Causes of chronic abdominal pain after RYGB.

- ▶ Psychiatric: eating disorders.
- ▶ Functional: irritable bowel syndrome, dumping syndrome and constipation.
- ▶ Biliary: cholelithiasis, cholangitis and pancreatitis.
- ▶ Gastrointestinal: gastric ulcers, gastric fistulas, gastro-oesophageal reflux disease, internal hernias, incisional hernias, inflammatory bowel disease and adhesions.

TREATMENT

Laparoscopic cholecystectomy.

OUTCOME AND FOLLOW-UP

Following laparoscopic cholecystectomy, the patient made an excellent postoperative recovery and at 12-month follow-up, she had gained 7 kg weight with complete resolution of her abdominal pain.

DISCUSSION

Salmonella infection is rare in developed countries. Most carriers are asymptomatic and the gall bladder is the known reservoir for chronic infection. In patients who have undergone a gastric bypass surgery, the reduced acid/gastric secretions may increase the risk to several bacterial infections.² The use of proton pump inhibitors (PPIs) and the association with the risk of enteric infections has been reported previously.³ Patients undergoing RYGB are routinely prescribed PPIs following surgery, further reducing acid suppression and increasing the risk to infections transmitted through the oral-faecal route. In some patients postsurgery, the combination of malnutrition and hypochlorhydria may contribute to the development of a salmonella infection.

Chronic abdominal pain and excessive weight loss are recognised complications of RYGB. Between 15% and 30% of patients will attend the accident and emergency department or require admission within 3 years of RYGB.⁴ The differential diagnosis for chronic abdominal pain includes many causes, some of which may be life threatening.⁵ Abdominal pain is an

important cause of chronic morbidity and is a difficult diagnostic dilemma. Most patients, like ours, undergo a number of investigations to exclude causes directly related to the procedure. Excessive weight loss is also a recognised complication and requires specialist input. Our patient presented with both chronic abdominal pain and excessive weight loss resulting in malnutrition. Initial investigations including OGD, colonoscopy and abdominal scanning were normal. Specialist dietetic input did not improve symptoms.

Salmonella infection and infection from other pathogens transmitted through the oral-faecal route remain a risk to patients undergoing gastric surgery.⁶ As this procedure becomes more common in less developed countries, we may see a rise in this cohort of patients. Patients travelling to endemic areas should be warned of the risks and a history of travel to such areas may be helpful.

We report the first case of chronic infection caused by *Salmonella* and cured by laparoscopic cholecystectomy after RYGB. Many algorithms have been reported in the literature for the investigation and management of chronic abdominal pain and excessive weight loss following RYGB,^{5 7} but none of them have included stool and urine culture as part of the work up.

We recommend that all patients presenting with abdominal pain should have a culture of stools and urine performed as a routine part of their investigations. Currently, routine concomitant cholecystectomy is not justified during RYGB surgery.⁸

Contributors ZS: collected notes, ensured the consent was obtained, submitted the paper, wrote the case report from the notes and discussed it with the corresponding author and the other two authors, ensured final uploading of the paper to the BMJ and checked the references. ZAS: wrote the summary/background and proof read the case report and did background research on line about the subject matter. FH: wrote the discussion helped by ZAS. MS: provided guidance and proof read the paper.

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Learning points

- ▶ Excessive weight loss and gastrointestinal (GI) symptoms after gastric bypass surgery may be due to causes unrelated to the procedure. *Salmonella* infection is more likely after gastric bypass surgery because of the loss of the protective role stomach acid plays in defence against ingested organisms.
- ▶ As bariatric surgery becomes more widespread, the risk of chronic infection with *Salmonella* in countries where this is common should raise concerns. The combination of malnutrition and hypochlorhydria may contribute to the development of salmonella infection.
- ▶ Even in patients with a Roux-en-Y gastric bypass, the source of infection is the gall bladder and not the biliary limb.
- ▶ Patients travelling to high-risk areas should be advised about the potential risks of contracting pathogens that can be ingested.
- ▶ Stool tests should be routinely performed in patients with chronic GI complaints after bariatric surgery.

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