CASE REPORT

Chronic subclinical perforation of a duodenal ulcer presenting with an abdominal abscess in a patient with seronegative rheumatoid arthritis

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SUMMARY

Peptic ulcer disease has been a major problem since the turn of this century with high morbidity and mortality. Perforation is less common, with an estimated incidence of 7–10 per 100 000. We present a young woman with rheumatoid arthritis presenting with anaemia. On work up, she was found to have a chronic abdominal abscess secondary to subclinical perforation of a duodenal ulcer. After undergoing percutaneous drainage, she became haemodynamically unstable and was taken for surgical washout and jejunostomy tube placement. A week later she had a decrease in the size of the abscess and was discharged home with drain and tube feeds. At her follow-up a few weeks later, she was tolerating goal tube feeds.

BACKGROUND

Peptic ulcer (PU) disease includes gastric as well as duodenal ulcers and has been a major problem since the turn of this century, with high morbidity and mortality.¹ The prevailing symptom of uncomplicated PU is epigastric pain, accompanied by bloating, early satiety and nausea. The most frequent complication of PU is bleeding, especially in patients over 60 years of age.^{2–3} Perforation is less common, with an estimated incidence of 7–10/100 000,⁴ and usually results in severe abdominal pain in combination with pneumoperitoneum on abdominal imaging.⁵

Rarely, patients may present with atypical symptoms because of comorbidities and/or ongoing medical therapies.^{6–8} In such instances, CT is the most valuable imaging modality for identifying the site and cause of gastrointestinal perforation. We present the case of a young woman who presented with atypical symptoms and was later found to have chronic abdominal abscess secondary to subclinical perforation of a duodenal ulcer.

CASE PRESENTATION

The patient, a 25-year-old woman diagnosed with seronegative rheumatoid arthritis 3 years prior, presented to our hospital with joint pains and swelling, primarily in the elbows, knees, ankles and fingers, which had progressed over the past few months. She had been on methotrexate for 2 years, with intermittent relief, and had undergone trials of hydroxychloroquine, adalimumab, rituximab, abatacept and etanercept. Prednisone had helped her and at the time of our clinical encounter she was on 40 mg/day. Her review of systems was positive

for foot dermatitis and black stools consistent with her history of anaemia. Her physical examination revealed a short, thin, chronically ill-appearing young woman. Her proximal interphalangeal joints, wrists, elbows, knees and ankles had evidence of synovitis. Her neck was tender in the midline from the occiput down to C7.

INVESTIGATIONS

Initial laboratory investigations revealed haematocrit of 23.7%, haemoglobin 7.4 mg/dL, mean cell volume 64 fL, white cell count $14.3 \times 10^9/L$ and platelets $691 \times 10^9/L$. Iron was 11 µg/dL and total iron binding capacity 308 µg/dL, iron saturation was 4% and absolute reticulocyte index was 0.0357. Sedimentation rate was high at 67 mm/h and C reactive protein was also high at 134.1 mg/L. Esophagogastroduodenoscopy (EGD) revealed focal distortion of architecture with mucin loss of enterocytes, foveolar metaplasia and focal neutrophilic activity, suggestive of non-specific duodenitis. Colonoscopy was unremarkable. Bone marrow biopsy showed normal flow cytometry and iron-deficiency anaemia. Liver ultrasound was negative for biliary disease and cholestasis. Owing to her continued anaemic state, the patient was admitted for transfusions.

TREATMENT

On admission, the patient was found to be febrile with a temperature of 38.7°C, with mild abdominal tenderness to palpation overall, and mild distention. Her repeat laboratory investigations revealed similar values as above. Blood and urine cultures were negative as well. A CT of the abdomen and pelvis (figure 1) revealed a large abscess seen in the anterior right upper quadrant of the abdomen measuring 19 cm×16 cm×10 cm, with perihepatic free fluid, marked thickening, and irregularity of the gastric antrum and duodenal bulb. No bowel obstruction was seen. Subsequently, the patient underwent a CT-guided percutaneous drainage of the abdominal abscess through which thick brown purulent material was aspirated and sent for culture. It grew *Klebsiella pneumonia* sensitive to ciprofloxacin. Surgery was then consulted for further evaluation and management. Considering the large abscess cavity, the patient was sent to interventional radiology for drain upsizing and aspiration. In total, 900 mL of thick fluid was aspirated with great difficulty, as the drain kept clogging. Infectious disease was also consulted, which

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Figure 1 CT of the abdomen and pelvis revealing a large abscess, 19 cm×16 cm×10 cm, in the right upper quadrant of the abdomen with perihepatic free fluid, marked thickening, and irregularity of the gastric antrum and duodenal bulb: (A) axial and (B) coronal.

recommended piperacillin/tazobactam with added fluconazole. The drain output remained persistently elevated at about 1 L/day. Repeat drain study a few days later identified the communication of the abscess with the second portion of the duodenum (figure 2). Soon after, the patient became hypotensive, tachycardic and in severe abdominal pain, with acute metabolic acidosis. Subsequently, she was consented for exploratory laparotomy and jejunostomy tube placement.

There was dense inflammation noted in the right upper quadrant with some filmy adhesions from the liver and gallbladder to the anterior abdominal wall. There was a thick mass adherent to the liver, gallbladder and duodenum, as well as to the right lower quadrant. There was no evidence of free fluid in this region. The area was soft and spongy, but easily compressible.

Figure 2 Fistulogram of the right upper quadrant drain revealed communication with loops of bowel representing the second portion of the duodenum.

Figure 3 Follow-up CT of the abdomen and pelvis a few days later revealed interval decrease and near resolution of the right upper quadrant abscess: (A) axial and (B) coronal.

There was no evidence of bowel oedema or necrosis. Moving forward, adhesions were taken down to identify the walled-off area in an effort to identify if there were any loculated pockets; there were none. Ultimately, the decision was made to continue the drain that was in place draining bile and not to enter the sac so as to prevent spread of the perforation and to keep it contained, and a jejunostomy tube was placed.

OUTCOME AND FOLLOW-UP

Postoperatively, the patient did extremely well and began tolerating her tube feeds. A week later, repeat CT showed decrease in the size of the draining abscess and the patient was discharged home with instructions for using the drain and tube feeds (figure 3).

At her follow-up a few weeks later, she was tolerating goal tube feeds, in addition to being orally fed. She had gained weight and was recovering extremely well.

DISCUSSION

Perforated PUs represent the major cause of gastrointestinal perforation and the second most common complication of PU

disease.⁹ Surgical intervention for perforated ulcer has taken a turn during the past few decades, and duodenography or gastrography with omentoplasty have replaced gastric resection as emergency operations.^{10 11}

Patients usually present with severe abdominal pain, though they may have atypical⁶ symptoms and/or they may be overlooked due to comorbidities⁷ or concurrent therapies.⁸ Our patient presented with primarily worsening severe joint pains and a history of black stools. Her EGD did not reveal any significant ulceration except some duodenitis. It is reasonable to assume that the area of concern had either sealed off by then or it may have been missed. While most gastroduodenal perforations will manifest, some may go undetected due to a self-sealed perforation or perforation contained by adjacent organs.^{5 12} However, it is surprising that this patient did not report of more severe abdominal pain. It is possible that the anti-inflammatory effects of her immunomodulators and prolonged use of steroids inhibited a florid immune response.

Nonetheless, after being admitted, the patient did undergo CT of the abdomen and pelvis, which revealed a right upper quadrant abscess. This further highlights the importance of

Patient's perspective

- ▶ The 3 years prior to the CT scan that identified the abscess were my most challenging years both physically and psychologically of my life. I had a variety of symptoms including, but not limited to, joint pains, cracked hands and feet, hair thinning and loss, weight loss, anemia, stomach pains and cessation of menstrual cycle. I visited an internal medicine doctor who referred me to specialists so soon all of the symptoms were being treated separately. I saw a hematologist who ran a variety of tests including a bone marrow biopsy and prescribe me iron to bring my hemoglobin level up, but it continued to go down. I saw a rheumatologist who diagnosed me with seronegative rheumatoid arthritis, a variety of treatments were prescribe including oral medications, self-injections and infusions, but all failed to show results and my joints continued to swell. I also was seeing a dermatologist who conducted several tests to determine the cause of the fissures on my feet and hands and diagnosed me with psoriasis and I was prescribed a variety of ointments which showed no results. The most disabling of the symptoms was my joint inflammation, I could not squat, make a fist, run and despite being below my recommend BMI had not seen my wrist bones, knuckles, or ankle bones for quite some time. Stairs become terrifying and opening things such as a water bottle became impossible. My brother moved in with me to help me and dependency on others in my early 20 s became a dreaded reality. Despite a plethora of medications for arthritis the inflammation continued to worsen and because this is what was causing me the most immediate dysfunction in my life, significantly limiting my mobility, this symptom is where much of my complaints and the medical treatment focused in on.
- ▶ Mayo was not a second opinion for me but a fourth opinion, although hopeless at this point there was another explanation besides the perfect storm of random diseases, my mother convinced me to go as she saw her daughter withering away in front of her. The first visits were much like the other doctor visits; I had seronegative arthritis, anemia, and my reproduction system looked like a post-menopausal woman. I was admitted to the hospital purely for the purpose of a blood transfusion and then was going to travel back home, but a doctor in the hospital, who will forever be my hero, decided to do a CT scan. I remember her coming to show me the CT scan pointing out that the fluid filled area that took over half my stomach was an abscess. Although ugly and invasive, I was so excited to see that abscess because it was an answer. I had 7 liters drained from the abscess shortly after the discovery and I remember feeling a sudden relief in my stomach as prior to that it was in a constant state of bloat. My first surgery was a result of a false alarm of me going septic, and because my organs were so inflamed a drain and feeding tube was put into place. I was then told to wait, wait until the inflammation of my organs went down and we would then figure out the next step from there. Within days my joints were no longer inflamed. Within weeks my hands and feet healed. Within months my menstruation returned, my hemoglobin returned to average levels and I started to gain weight. All these facts remain, almost 5 years later.
- ▶ I transferred back to a hospital in my home state where I received my second surgery about 3 months later. The surgeon placed a patch over the hole in the duodenum with success. I was prescribed a daily antacid for ulcer prevention. About 13 months later I went into the doctor with stomach pains and was admitted to the hospital for a CT scan and the images brought concern that another abscess developed. I was transferred to the care of my previous surgeon who treated me as an inpatient with antibiotics for about a week, that cleared up the infection that was the result of the abnormalities in the CT scan. Besides that no other issues have arisen since my second surgery.
- ▶ Prior to my visit to Mayo I thought the rest of my life would be limited in regard to what I could do physically. In my early 20 s my life was extremely restricted and painful. I was given a second chance to life because of Mayo and cannot describe how good it still feels to be able to do the small things like kneel down or clench my fist, and the more important things like be independent. At one point I was told arthritis would be a struggle the rest of my life but since the abscess was drained I have not had any inflammation or joint pain and have not taken any medication for arthritis.

imaging studies to look for signs of perforation in high-risk patients such as ours. CT scan may be useful not only to look for direct findings of gastrointestinal perforation such as contrast extravasation,^{13 14} but also to reveal any free intraperitoneal air or other signs.^{12 14–16} Even after the abscess was discovered, it was unclear where it had originated from, until the follow-up imaging after percutaneous drainage revealed a communication with the second portion of the duodenum.

Unfortunately, the patient became unstable and warranted a surgical intervention. On exploration, she had a copious amount of adhesions around the abscess. Even after taking down the walled-off cavity, it was evident that the drain had contained the perforation and it would be better not to undertake any extensive reconstruction. Subsequently, a jejunostomy tube was placed to help heal the primary site of perforation and provide the patient with enteral feeding support. Even though there have been reported cases of abscesses related to gastrointestinal perforation,¹⁵ the majority have been dealt with by primary repair. To the best of our knowledge, conservative management involving containing the perforation and giving it time to heal has not been reported for duodenal perforations.

Learning points

- ▶ Peptic ulcer disease is a major problem, with high morbidity and mortality, with perforation resulting in an incidence of 7–10/100 000.
- ▶ Severe abdominal pain is the most common symptom, although patients can present with atypical symptoms.
- ▶ Imaging, involving CT of the abdomen, is the mainstay of diagnosing patients who are haemodynamically stable.
- ▶ Management usually involves surgical intervention; however, conservative management may play a role in select patients.

Contributors ABC was involved in treating the patient. AA and ABC gathered data and analysed it for the manuscript. AA and ABC drafted the manuscript and approved the final version.

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