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CASE REPORT

Multifocal Crohn's disease involving the upper gastrointestinal tract: a complex case presentation and management approach

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Case presentation

A 38-year-old male patient from Mitchell's Plain, Cape Town presented to the Gastrointestinal (GI) unit at Groote Schuur Hospital with a longstanding history of upper GI symptoms dating back to 2017. He described recurrent episodes of nausea, vomiting, severe abdominal cramps, and post-prandial fullness. The patient reported an inability to tolerate meals, with symptoms typically occurring within 30 minutes of eating. The frequency and intensity of these episodes became progressively worse over time and were associated with anorexia and significant weight loss. Additionally, he experienced chronic, watery, non-bloody diarrhoea, with 6-7 episodes per day, as well as occasional fevers but no night sweats or history of tuberculosis contacts. He denied any history of dysphagia, odynophagia, or previous episodes of GI bleeding.

The patient also had a significant history of smoking, recreational drug use (marijuana), and previous heavy alcohol abuse. He had no family history of inflammatory bowel disease or GI malignancies, and no other comorbid illnesses.

Diagnostic workup and evaluation

Over the years, he underwent multiple upper GI endoscopies, which revealed the presence of a hiatus hernia, acute gastritis, duodenal polyps, and duodenitis. He received several courses of *Helicobacter pylori (H. pylori*) eradication and proton pump inhibitor (PPI) therapy, which provided only minimal relief. An oesophageal manometry study performed in 2019 demonstrated a normal lower oesophageal sphincter pressure with relaxation but ineffective oesophageal motility. He was subsequently lost to follow-up during the COVID period.

In February 2022, he was re-referred by the Mitchell's Plain District Hospital to our upper GI surgical team for further evaluation and management. His symptoms had persisted and became progressively more severe. He weighed 45 kg and had lost a total of 30 kg since his illness began. He was unable to eat and was diagnosed with gastric outlet obstruction.

Initial blood investigations conducted at this stage was relatively unremarkable, except for the presence of iron deficiency and mildly elevated C-Reactive Protein of 16 mg/L. His renal function and electrolytes, liver function tests and full blood count was normal. His vitamin B12 level was 687 pmol/L. His stool examination revealed no leucocytes, parasites, or pathogens. A faecal calprotectin was 41 ug/g.

Repeat upper GI endoscopies revealed persistent duodenitis with multiple duodenal polyps.

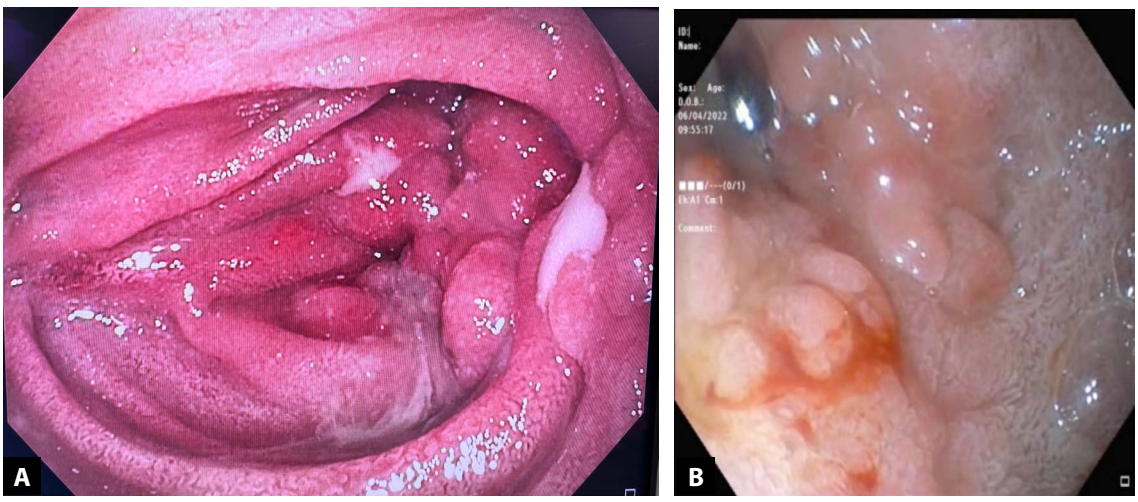

Figure 1: A and B demonstrate ulcerations, mucosal oedema and nodularity, cobble stoning and slough of the duodenum

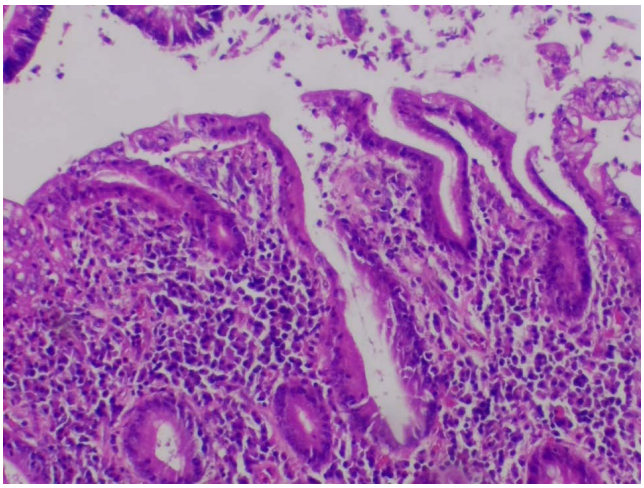

Figure 2: Jejunal mucosa with villous blunting

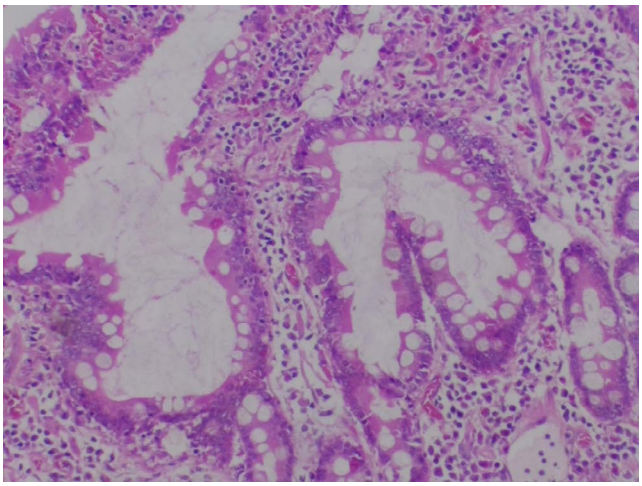

Figure 3: Jejunal crypts with crypt branching

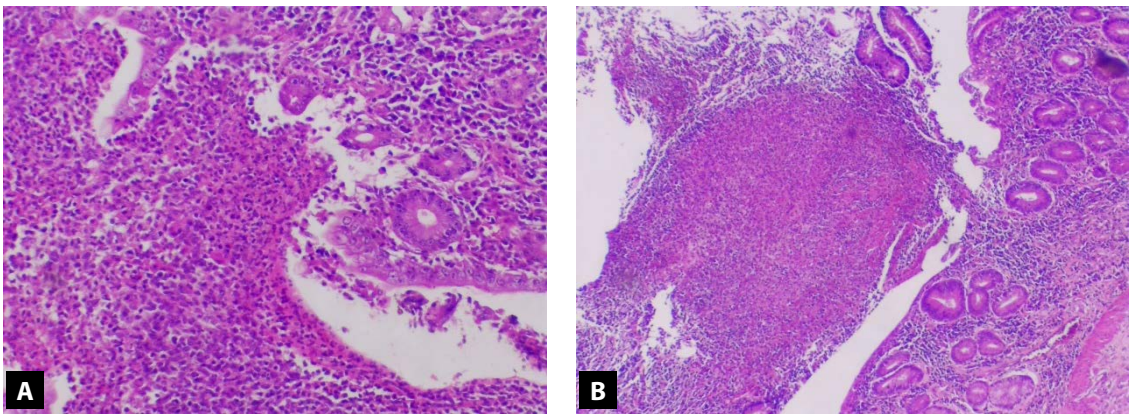

Figure 4: A and B demonstrating ulceration at 40X magnification and 200X magnification.

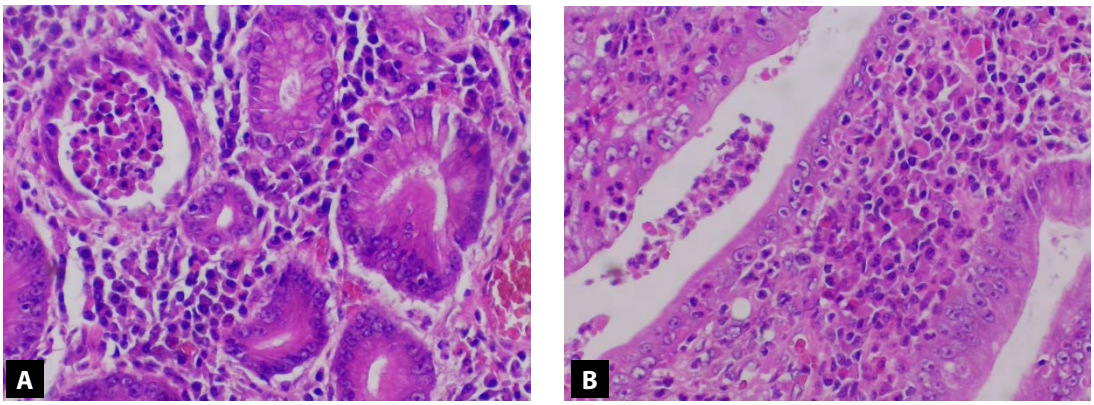

Figure 5: A and B demonstrating cryptitis and crypt abscess is seen in the left upper corner respectively.

Histological examination of the duodenal and jejunal biopsies demonstrated chronic active duodenitis and jejunitis with ulceration, but no evidence of *H. pylori*, tuberculosis, fungi, parasites, or viral inclusions.

A computed tomography (CT) enterography of his abdomen in March 2022 revealed a prominent and distended stomach and duodenum (Figure 6). There was significant bowel wall thickening and mucosal enhancement in the 3rd and 4th part of the duodenum. A follow-up barium meal and follow-through confirmed the presence of incomplete gastric outlet obstruction. (Figure 7)

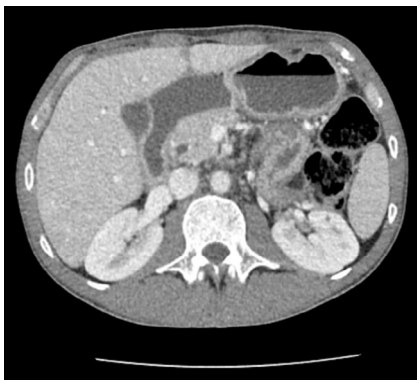

Figure 6: Computed tomography (CT) enterography in March 2022

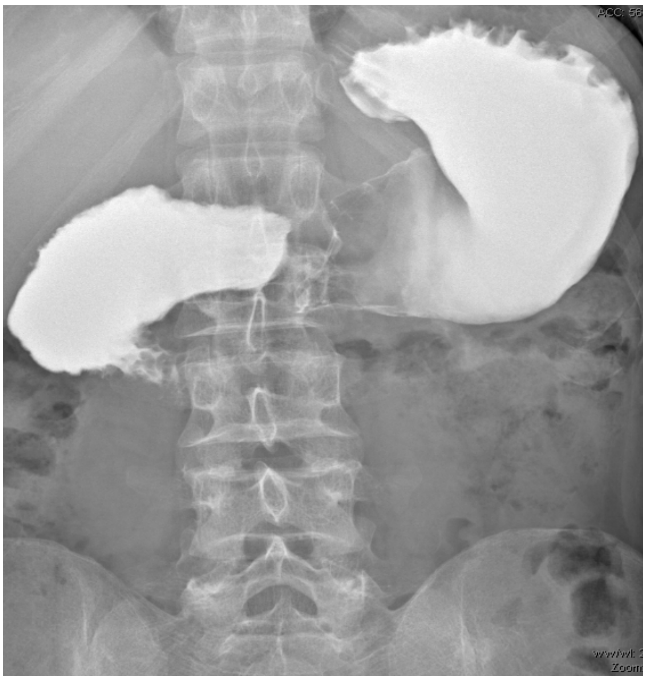

Figure 7: Barium meal and follow-through in March 2022

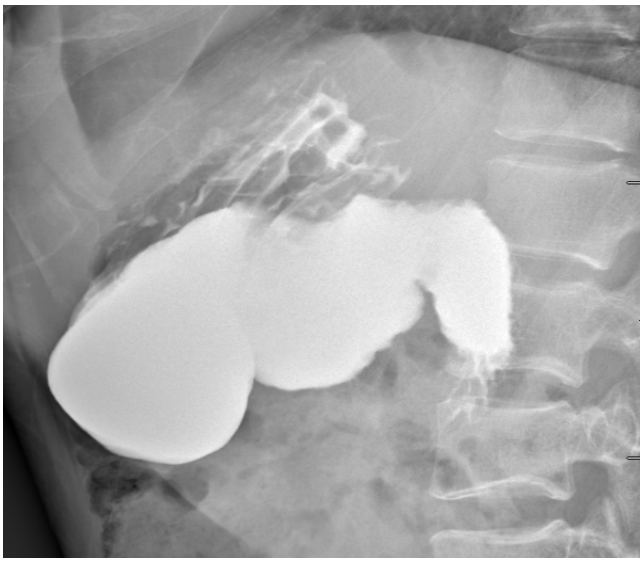

Figure 8: Barium meal and follow-through in March 2022

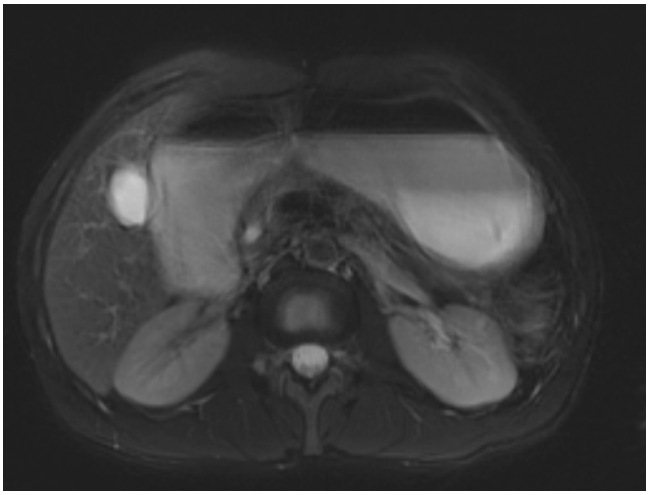

Figure 9: Magnetic resonance cholangiopancreatography (MRCP) in May 2022

A magnetic resonance cholangiopancreatography (MRCP) performed in May 2022 demonstrated significant interval change from the initial CT-enterogram in March 2022 (Figure 9). There was an abrupt change in the diameter of the D2/D3 junction with significant luminal narrowing and upstream dilatation of D2, D1 and the stomach. The proximal jejunum was thick-walled with an irregular lumen, thickened folds and mucosal enhancement. These features were compatible with an inflammatory stricture of the D2/D3 and significant bowel wall oedema of the jejunum causing gastric outlet obstruction.

Surgical intervention and diagnosis

Given the patient's refractory and obstructive symptoms, progressive weight loss, and radiological findings, an exploratory laparotomy was performed in June 2022. The laparotomy revealed extensive involvement of the entire small bowel with abnormal thickening of the bowel wall and multiple areas of early diverticular formation. Only the distal 100 cm of the small bowel appeared macroscopically normal.

Instead of the planned gastrojejunostomy, a jejunal bypass onto the duodenum with a Roux-en-Y entero-enterostomy was performed, considering the diffuse small bowel involvement. Histopathological examination of the resected small bowel segment revealed findings consistent with Crohn's disease, including architectural distortion, crypt distension, mucosal ulcerations, and transmural inflammation.

Postoperative course and management

At the 2-month postoperative follow-up visit, the patient reported ongoing symptoms and was found to be severely malnourished, weighing only 40 kg. A follow-up faecal calprotectin was elevated at 783 ug/g.

A follow-up magnetic resonance enterography (MRE) and barium meal and follow-through in December 2022 demonstrated interval improvement in his gastric outlet obstruction compared to previous studies but ongoing long-segment inflammation of his duodenum and jejunum.

The patient was treated with methotrexate and adalimumab, he had a very good clinical response with an improvement in his upper GI symptoms. He was eventually able to tolerate fluids and solids, with subsequent clinical resolution of his gastric outlet obstruction. His appetite improved and he gained 15 kg in weight over the following 6 months.

Discussion

This case report highlights the complex and challenging nature of Crohn's disease involving the upper GI tract, also known as "foregut Crohn's". The understanding and recognition of this entity have evolved significantly since the landmark work of Crohn, Ginzburg, and Oppenheimer in the 1930s.[4] Whilst Crohn's disease classically affects the terminal ileum and colon, involvement of the oesophagus, stomach, and duodenum can occur in a small subset of patients, often posing significant diagnostic and management difficulties. Indeed, isolated upper

GI[1] disease is exceedingly rare. These patients are at an increased risk of complications, such as strictures, with a higher likelihood of requiring surgical intervention.[5]

Foregut Crohn's disease is widely recognised as an underdiagnosed entity, with a reported prevalence ranging from 0.5% to 4% of all Crohn's disease cases. The initial presentation of upper GI symptoms, such as nausea, vomiting, abdominal pain, and weight loss, can often be non-specific and misleading, leading to delays in accurate diagnosis.[6] In our patient, the longstanding history of symptoms, initially attributed to a hiatus hernia and gastro-oesophageal reflux disease (GORD), exemplifies the diagnostic pitfalls associated with foregut Crohn's.

A key observation in this case is the extensive involvement of the proximal small bowel, with most of the small intestine appearing abnormally thickened and displaying early diverticular changes during the surgical exploration. This pattern of diffuse small bowel involvement is a hallmark of the "gastroduodenal Crohn's" phenotype, wherein the duodenum and proximal jejunum are most affected.[6] In contrast to the classic distal small bowel and colonic Crohn's disease, this variant often presents with more obstructive symptoms, such as nausea, vomiting, and weight loss, as highlighted in our case.

The diagnostic workup in this patient involved a combination of endoscopic, radiographic, and surgical assessments. The following diagnostic modalities may assist in the evaluation of these complicated patients.[5-12]

1. **Imaging and histology**: A combination of imaging modalities and histological evaluation is often required to diagnose Crohn's disease of the upper GI tract. Endoscopic features alone may be relatively non-specific but can demonstrate characteristic findings like Crohn's disease in the lower GI tract. One key distinguishing feature is that Crohn's disease ulcers tend to be linear, whereas peptic ulcers are typically circular. Common endoscopic findings include mucosal nodularity, cobble stoning, thickened folds, and ulcerations.
2. **Advanced imaging CT-enterography** and **magnetic resonance-enterography (MRE)** are usually more sensitive in detecting the characteristic features of foregut Crohn's disease. These modalities can identify early findings, such as mucosal nodularity and thickened folds, as well as later complications like fistulising disease, strictures, and impaired GI motility.
3. **Capsule endoscopy** may be beneficial in evaluating the small bowel, but caution is warranted in the presence of strictures, which could potentially cause capsule retention.

Whilst upper endoscopy may demonstrate non-specific features, such as mucosal nodularity, ulcerations, and strictures, the diagnosis of foregut Crohn's ultimately requires a high index of suspicion and a multidisciplinary approach.[13] In our patient, the intraoperative findings and subsequent histopathological examination of the resected small bowel segment were crucial in establishing the definitive diagnosis of Crohn's disease.

The management of upper GI Crohn's disease is particularly challenging and often requires a tailored, multidisciplinary approach involving gastroenterologists, surgeons, radiologists, dietitians, and the rest of the allied healthcare professionals.[13] Medical therapy is often used to improve symptoms and, the underlying bowel inflammation, and is a bridge for more definitive endoscopic or surgical options.[14] It is also used an adjunct whilst the nutritional status of the patient is optimised, often requiring a lengthy inpatient process in the setting of an intestinal failure unit.[14] Commonly used medical therapies include:

- PPIs can provide symptomatic relief in most patients without the need for immunosuppression. However, PPIs do not address the underlying mucosal inflammatory disease.
- Concomitant treatment of *H. pylori* infection if present, is recommended as part of the management approach.
- Many patients with upper GI Crohn's disease may already be receiving systemic therapies, such as steroids, immunosuppressants, and biologics, for the management of their lower GI Crohn's disease. These often need to be adjusted and tailored for the individual needs of each patient. Our patient benefitted tremendously from the initiation of an anti-tumour necrosis factor (TNF) agent.

Patients with upper GI Crohn's disease often have refractory symptoms or obstructive complications requiring endoscopic or surgical interventions.[9,15] Endoscopic treatment, when available, is limited to patients with a single, short-segment stricture (less than 4cm) that is amenable to dilatation. This may be a less invasive approach compared to surgery. However, it is not a long-term solution and usually offers only temporary relief. In a study by Matsui *et al*, successful endoscopic dilatation using 18-20mm balloons was reported in five patients with short segment strictures.[16]

In a larger Chinese study, 67 endoscopic dilatations were performed for upper GI Crohn's strictures, with a 92.5% success rate and a complication rate of only 3%. However, at two years of follow-up, nine patients still required surgery, and only a quarter of patients achieved long-term success with endoscopic dilatation alone. Factors associated with successful endoscopic dilatation included a stricture length less than 4cm and the absence of ulceration at the stricture site. Patients who continue to smoke or required multiple dilatations for recurrent strictures are more likely to require surgery.[17]

However, many patients with upper GI Crohn's disease require surgical intervention**.** This is applicable to approximately one-third of patients with duodenal Crohn's disease. The main indications for surgery include refractory obstructive symptoms despite maximal medical therapy and failed endoscopic therapy. Surgical options include resection, bypass or stricturoplasty.[18-22]

1. **Resection** – Resection of affected duodenal Crohn's disease is an uncommon indication and carries a high morbidity.

This is particularly relevant for proximal duodenal resections (pancreaticoduodenectomy). Segmental resection of strictures distal to the ampulla may be considered, with end-to-end or end-to-side anastomosis to the proximal jejunum, whilst monitoring for postoperative recurrence.

2. **Bypass** - Bypass procedures, such as Roux-en-Y gastrojejunostomy or antecolic gastrojejunostomy, are often preferred over resection. These bypass techniques can effectively manage obstructive symptoms while avoiding the complications associated with resection. Potential postoperative issues include delayed gastric emptying, ongoing inflammation in the bypassed limb, and anastomotic complications. Our patient underwent a jejunal bypass onto the duodenum with a Roux-en-Y entero-enterostomy, which was considered a more appropriate surgical approach given the diffuse small bowel involvement.
3. **Stricturoplasty** - Stricturoplasty is the most utilised surgical technique for duodenal Crohn's disease. It is well-documented, safe, and an effective bowel-preserving procedure. Different techniques, such as the Heineke-Mikulicz technique for shorter strictures (< 10 cm) and the Finney technique for longer strictures (>10 cm), are utilised. The extensive mobilisation required for duodenal stricturoplasty is a technical challenge that may limit its use.

Conclusion

This case report highlights several key points in the management of upper GI Crohn's disease. Foregut Crohn's is a difficult-to-treat phenotype, often associated with delayed diagnosis due to non-specific symptoms. The clinical course tends to be protracted and complicated, with the most common presentation being duodenal strictures leading to gastric outlet obstruction. Optimising the patient's medical treatment and nutritional status is critical, given the significant risk of complications and high likelihood of requiring endoscopic or surgical interventions. The management of foregut Crohn's carries substantial morbidity, emphasising the need for a multidisciplinary collaborative approach involving gastroenterologists, surgeons, radiologists, histopathologists and dietitians.

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