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DELAYED PRESENTATION OF BLIND LOOP SYNDROME AS IRON DEFICIENCY ANAEMIA FOLLOWING ILEO-COLONIC ANASTOMOSIS: A RARE POSTOPERATIVE COMPLICATION

Lana El Chal[1], Philippe Attieh[1], Cynthia Ghraizi[1], Ibtihaj Saad[1], Karam Karam[2], Elias Fiani[2]

[1] Department of Internal Medicine, University of Balamand, Beirut, Lebanon
[2] Department of Gastroenterology and Hepatology, University of Balamand, Beirut, Lebanon

Corresponding author's e-mail: karamek7@gmail.com

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ABSTRACT

Blind loop syndrome is a malabsorptive condition resulting from intestinal stasis, which promotes bacterial overgrowth and leads to various gastrointestinal and systemic manifestations. It often occurs secondary to anatomical or motility abnormalities, particularly after gastrointestinal surgeries. We present the case of a 75-year-old male with a history of colon cancer status post right hemicolectomy with ileo-colonic anastomosis, who was incidentally found to have severe iron deficiency anaemia during a routine check-up. One year prior, follow-up endoscopies were normal. However, recent investigations revealed a hyperplastic polyp in the gastric cardia and, more importantly, a blind loop with ulcerations distal to the ileum on colonoscopy. Biopsies confirmed ulcerated ileal/colonic mucosa with granulation tissue. The patient underwent surgical resection of the blind loop with the creation of an ileo-transverse anastomosis. Postoperatively, he recovered well and was discharged on a regular diet. This case illustrates the importance of considering blind loop syndrome in patients with a history of bowel surgery who present with non-specific symptoms such as anaemia. It also highlights the potential for delayed onset and the diagnostic value of endoscopy when routine workups are inconclusive. Surgical correction remains the definitive treatment in anatomically driven cases, offering significant symptomatic relief and prevention of further complications.

KEYWORDS

Blind loop syndrome, iron deficiency anaemia, ileo-colonic anastomosis

LEARNING POINTS

- Blind loop syndrome should be suspected in patients with prior bowel surgeries.
- It can present as anaemia.
- It may present years after surgery.
- It may be more common than statistics suggest, as it is often underdiagnosed or misdiagnosed.

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INTRODUCTION/BACKGROUND

Although unlikely, blind loop syndrome is a malabsorptive disorder characterised by stagnation of a part of the intestine leading to functional impairment[1]. It could be the result of several aetiologies including surgical complications, inflammatory or functional disorders, or anatomic changes[2]. The stasis caused by blind loop syndrome leads to food build-up which favours bacterial overgrowth, and this translates into different symptoms and morbidities including diarrhoea, anaemia and malnutrition[2,3]. We report a case of a 75-year-old man with a history of colon cancer and right hemicolectomy presented for investigation of iron deficiency anaemia. Gastroscopy revealed a benign hyperplastic polyp; colonoscopy showed a blind loop with ulceration at the anastomotic site, and biopsies confirmed ulcerated ileal/colonic mucosa. He underwent surgical resection of the affected segment and creation of a new ileo-transverse anastomosis. The patient recovered well and was discharged on a regular diet five days postoperatively.

CASE DESCRIPTION

A 75-year-old man presented to our hospital for a scheduled outpatient colonoscopy. The patient is known to have hypertension and a history of colon cancer status post right hemicolectomy with ileo-colonic anastomosis two years previously.

One year prior to presentation, the patient had a gastroscopy and colonoscopy for follow-up and they were normal. However, he had recent laboratory work done as an outpatient for a check-up and was found to have iron deficiency anaemia with haemoglobin 7.2 g/dl, serum iron 6.9 µg/l, ferritin 24 ng/l, transferrin saturation 11% and total iron binding capacity 14 µmol/l. For further investigations, the patient was scheduled for a gastro-colonoscopy. During gastroscopy, multiple biopsies were taken from the gastric cardia which showed hyperplastic polyp with surface erosion and scattered intestinal metaplastic cells, without evidence of dysplasia. Biopsies from the stomach antrum, body and duodenum were normal. On colonoscopy, the patient was found to have an intact ileum part followed by a blind loop with ulcerations *(Fig. 1)*. Biopsies were taken from the blind segment to assess whether it was a continuation of the ileum or a part of the colon; results showed ileal/colonic mucosa with ulceration and granulation tissue formation. The patient was then scheduled for open laparotomy where we resected the previous anastomotic site and end to end ileo-transverse anastomosis was performed using a stapler. Postoperatively the patient was doing well and was discharged on a regular diet on day five after surgery.

DISCUSSION

Blind loop syndrome, also called stagnant loop syndrome, is a malabsorptive gastrointestinal disease requiring clinical attention. In many causes it can lead to motility disorders, inflammatory diseases and anatomic abnormalities being the most common issues. Afferent loop syndrome, anastomosis and surgical complications such as fistulas and strictures might lead to food stagnation and bacterial overgrowth. It predominantly arises after surgical interventions, particularly a right hemicolectomy with ileo-anastomosis, due to subsequent dilation and delayed nutrient transit, resulting in food stagnation and bacterial overgrowth; furthermore, ulcerations may occur in this area[2]. Motility disorders such as diabetic gastroparesis and Parkinson's disease, or inflammatory diseases such as radiation enteritis and diverticulitis might be major causes[1].

Although it is uncommon, blind loop syndrome has a combination of symptoms that strongly suggest its presence. These can be diarrhoea, steatorrhoea, abdominal pain, malnutrition leading to different vitamins deficiencies and their consequences, megaloblastic anaemia, iron deficiency anaemia, hypocalcaemia, ulcerations and sometimes bleeding[1,2]. In our case, the patient presented with iron deficiency anaemia two years postoperatively, likely resulting from mucosal injury and malabsorption process in the blind segment.

Motility disorders or anatomical problems post colectomy and anastomosis can cause food stasis in the proximal small intestine, which blocks the lumen flow. As food accumulates progressively, it becomes a central point for bacterial overgrowth[1].

Based on the literature, the most common bacteria are anaerobes such as *Lactobacillus*, *Bacteroides*, *Escherichia coli* and *Streptococcus*. But the pathophysiology by which these bacteria induce cobalamin (vitamin B12) deficiency remains uncertain. One hypothesis states that these bacteria release toxins that harm the gastrointestinal tract, whereas another theory indicates that they consume the available vitamin B12 in the lumen for their growth[1]. Not only is vitamin B12 affected, but fat absorption is also disrupted in blind loop syndrome. Typically, fat-rich food is emulsified by bile acids in the duodenum. The normal flora deconjugate a small amount of bile acids, which are then excreted in the stool. However,

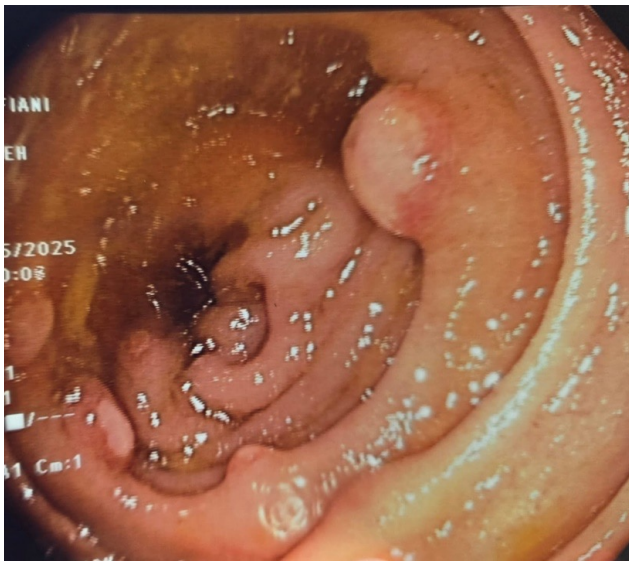


Figure 1. Colonoscopy showing intact ileum part followed by a blind loop with ulcerations.

in cases of bacterial overgrowth, an increased presence of bacteria leads to a higher concentration of unconjugated bile acids, resulting in steatorrhoea and fatty stools[1].

Moving on to the diagnostic tools, many tests are used to assess blind loop syndrome. Radiological tests play an important role in identifying it such as X-rays, computed tomography scans, computed tomography enterography and barium swallow. A barium swallow study is essential since it visualises gastrointestinal transit and motility, revealing abnormalities consistent with this motility disorder and detecting anomalies such as fistulas and jejunal diverticulosis[1]. In case of strong clinical suspicion, a hydrogen and bile acid breath test, faecal fat test and D-xylose absorption test can be performed. A faecal fat test is important to identify steatorrhoea, followed by the hydrogen breath test and D-xylose test so that bacterial overgrowth can be identified[1]. In our case, surveillance endoscopies one year earlier were normal; however, a recent colonoscopy revealed a blind loop distal to the ileum with ulcerations consistent with blind loop syndrome, and no other diagnostic tools were used. This finding demonstrates the delayed onset of the condition pointing out the importance of maintaining a high suspicion for blind loop syndrome in patients with history of bowel surgeries presenting with unexplained nutritional deficiencies, such as iron deficiency anaemia, or patients who presents non-specific gastrointestinal symptoms, and it highlights the value of endoscopy in identifying structural aetiology when routine evaluations are inconclusive.

The treatment of blind loop syndrome ranges from medical to surgical management along with nutritional support. Medical treatment mainly consists of antibiotics with anaerobes coverage such as tetracyclines (used before), metronidazole or rifaximin. One course of antibiotics is sufficient to work on the bacterial overgrowth caused by blind loop syndrome. If unresolved on different antibiotic courses, surgical management might be an option. If blind loop syndrome and bacterial overgrowth are caused by an anatomical issue, surgery is important to resect the blind loop and remake the anastomosis[1]. Since malnutrition and vitamin B12 might be a result of blind loop syndrome, a high calorie, low-fat diet is needed to correct underlying deficiencies[1].

Previous cases of blind loop syndrome following abdominal surgeries have been reported. Pal et al. reported a 54-year-old diabetic man with prior right hemicolectomy for caecal cancer who presented with peritonitis. Imaging revealed pneumoperitoneum and an inflamed ileal loop. An exploratory laparotomy found a micro-perforated blind loop; resection and re-anastomosis were performed. Recovery was uneventful[4]. Kubo et al. reported a 79-year-old man with prior ileus surgery and long-term antithrombotic use who experienced recurrent melaena. Imaging revealed a blind pouch with side-to-side anastomosis causing an anastomotic ulcer. Laparoscopic resection resolved the symptoms, and he remained stable for six months postoperatively[5]. Furthermore, Sinha et al. describes a 75-year-old man with prior abdominal surgery presented with bowel obstruction and sepsis. An exploratory laparotomy revealed a gangrenous colon and prior ileo-sigmoid anastomosis. Resection and Hartmann's procedure were performed, but the patient died postoperatively from sepsis and multi-organ failure[6]. In addition, a 68-year-old woman with prior bowel surgery presented with persistent abdominal pain, emesis and diarrhoea. Imaging revealed inflammatory small bowel changes, and exploratory laparotomy identified adhesions, internal hernia and obstructing enteroliths. Surgical resection resolved symptoms, and she remained well postoperatively[7]. Three cases reported by Valle et al. (2014) describe instances of blind loop syndrome complications, specifically perforation, following side-to-side ileo-colonic anastomosis[2]. Similarly, Bucknall et al. described two cases of a blind loop resulting from side-to-side anastomoses of ileum to colon[8].

Our case is unique due to its late-onset presentation of blind loop syndrome two years following a right hemicolectomy with ileo-colonic anastomosis, which is rarely reported in literature. Most blind loop syndrome cases tend to present earlier or with more overt gastrointestinal symptoms, while our patient presented solely with severe iron deficiency anaemia. Surveillance endoscopies performed one year earlier were normal, highlighting the insidious and delayed development of the condition. Additionally, the presence of a blind loop with ulceration at the anastomotic site, despite a prior normal colonoscopy, emphasises the progressive nature of the anatomical complication. Unlike previously reported cases where blind loop syndrome was often associated with obstruction, sepsis – or perforation in our case – was managed electively, without acute surgical urgency. The resolution of symptoms following surgical resection confirms the anatomical basis of the pathology. This case underlines the importance of maintaining suspicion for blind loop syndrome in patients with prior bowel surgeries and unexplained anaemia.

CONCLUSION

Although unlikely, blind loop syndrome is an important complication that should be considered years after gastrointestinal surgery, such as hemicolectomy with ileo-colonic anastomosis. This case highlights the atypical presentation of blind loop syndrome as isolated iron deficiency anaemia without overt gastrointestinal symptoms. It underscores the need for high clinical suspicion in patients with prior bowel surgeries presenting with unexplained anaemia or malabsorption. Timely endoscopic evaluation and appropriate surgical intervention are essential for diagnosis and management. Recognition of this condition can prevent long-term complications and improve patient outcomes, as demonstrated by the successful resolution of symptoms following surgical correction in our patient.

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