

# Megaloblastic Anemia Associated with Small Bowel Resection in an Adult Patient

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## Abstract

Megaloblastic anemia is characterized by macro-ovalocytosis, cytopenias, and nucleocytoplasmic maturation asynchrony of marrow erythroblast. The development of megaloblastic anemia is usually insidious in onset, and symptoms are present only in severely anemic patients. We managed a 57-year-old male who presented at the Hematology clinic on account of recurrent anemia associated with paraesthesia involving the lower limbs, 4-years-post small bowel resection. Peripheral blood film and bone marrow cytology revealed megaloblastic changes. The anemia and paraesthesia resolved with parenteral cyanocobalamin.

**Keywords:** Bowel resection, megaloblastic anemia, neuropathy, paraesthesia

## INTRODUCTION

Megaloblastic anemia is due to deficiencies of Vitamin B12 and or Folic acid. The primary dietary sources of Vitamin B12 are meat, eggs, fish, and dairy products.<sup>[1]</sup> A normal adult has about 2 to 3 mg of vitamin B12, sufficient for 2–4 years stored in the liver.<sup>[2]</sup> Pernicious anemia is the most frequent cause of Vitamin B12 deficiency and it is associated with autoimmune gastric atrophy leading to a reduction in intrinsic factor production. Vitamin B12 deficiency may also develop following gastrectomy or ileal resection, malabsorption syndrome, fish tapeworm infestation, and pancreatic insufficiency.<sup>[3,4]</sup>

Megaloblastic anemia is usually characterized by nucleocytoplasmic maturation asynchrony of the megaloblasts. This condition is due to impaired DNA synthesis which inhibits nuclear division while cytoplasmic maturation which depends mainly on RNA and protein synthesis is less impaired.<sup>[5]</sup> Development of megaloblastic anemia is usually insidious in onset and symptoms are present only in severely anemic patients. Thus, the patient may not relate the anemia to the previous bowel resection unless the clinician explores the past medical history. Other differentials such as myeloproliferative diseases, alcoholism, parasitic infections, and drugs should be explored in medical history.<sup>[5]</sup>

Neurological manifestations are usually that of paraesthesia and lancinating pains caused by peripheral neuropathy

affecting mainly the lower extremities which may mimic symptoms of spinal canal stenosis.<sup>[1]</sup> Megaloblastic anemia has been reported following small bowel resection in infants and children but a rare complication of small bowel resection in adults.<sup>[4,6,7]</sup> We highlighted our experience with the clinical presentation and management of megaloblastic anemia secondary to bowel resection.

## CASE REPORT

A 57-year-old male who presented to the Hematology clinic following referral from a Primary Healthcare Centre on account of recurrent anemia associated with paraesthesia of the lower limbs. He has had five units of blood transfused within three months. No history of the passage of bloody stool, hematuria, hematemesis, or hemoptysis. He resides in the rural community and feeds mainly on yam, vegetables and bush meat. Medical history revealed he had extensive bowel resection involving the ileum four years before presentation

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**How to cite this article:** Ibijola AA, Okunlola AI. Megaloblastic anemia associated with small bowel resection in an adult patient. *Niger J Med* 2021;30:210-1.

**Submitted:** 12-Sep-2020

**Revised:** 07-Jan-2021

**Accepted:** 12-Jan-2021

**Published:** 22-Apr-2021

### Access this article online

Quick Response Code:



**Website:**  
www.njmonline.org

**DOI:**  
10.4103/NJM.NJM\_156\_20

on account of acute abdomen. His past medical record before bowel resection showed packed cell volume (PCV) 47%, white blood cells (WBC)  $7.2 \times 10^9/L$ , and normal film appearance.

Examination revealed a middle-aged man with severe pallor, tachycardia, Hunter's glossitis, and splenomegaly of 6-cm below left coastal margin. The examination of other systems was normal. Clinical diagnosis of recurrent anemia was made. The full blood count showed PCV 24%, WBC  $3.0 \times 10^9/L$  MCV 106 fl. Peripheral blood film revealed macroovalocytosis, occasional circulating megaloblasts and hypersegmented neutrophils. Bone marrow cytology revealed nucleo-cytoplasmic maturation asynchrony and giant metamyelocytes. However, serum Vitamin B12, red cell folate, intrinsic factor antibodies, endoscopy, and biopsy were not done due to financial constraints.

A diagnosis of megaloblastic anemia was made based on the peripheral blood film and bone marrow cytology findings. He was admitted and had therapeutic trial with parenteral cyanocobalamin 1000  $\mu\text{g}$  thrice weekly for two weeks.<sup>[8,9]</sup> There was progressive improvement in the PCV from 24% to 34% with improvement in the peripheral neuropathy. He was commenced on the maintenance dose of 1000  $\mu\text{g}$  monthly which he had for six consecutive months before he was lost to follow-up. He re-presented 2 1/2 years after initial treatment with a repeat history of recurrent blood transfusion at a private hospital associated with recurrent paraesthesia in the lower limbs. Repeat full blood count showed PCV 31%, WBC  $6.2 \times 10^9/L$ . Full investigation and management have been severely hampered due to financial constraint. He has been scheduled to recommence cyanocobalamin and follow-up with medical social workers.

## DISCUSSION

Megaloblastic anemia is nutritional anemia due to deficiency of Vitamin B12 or Folic acid.<sup>[10]</sup> The primary dietary sources of Vitamin B12 in man are meats, eggs, fish, and milk products as Vitamin B12 cannot be synthesized by the mammalian species.<sup>[2]</sup> Human, therefore, depend entirely on dietary sources of Vitamin B12. The average daily intake is about 4  $\mu\text{g}$  while the physiological need is about 0.5–1.0  $\mu\text{g}/\text{day}$ .<sup>[10]</sup>

The index patient resides in the rural community and feeds mainly on the natural diet which is supposed to provide adequate nutrition if the natural pathway for digestion and absorption of food is intact. The onset of the anemia and paraesthesia correlate with the likely period of depletion of the body store of the Vitamin B12. Patient education and proper follow-up schedule which are an integral part of functioning health-care delivery system could have prevented late diagnosis and unnecessary multiple blood transfusions. There were gaps in this patient's care and he had a repeat of poor follow-up record and recurrent symptoms after initial care which was due to financial constraint. Oral cyanocobalamin is cheaper and it has been shown to have similar safety and efficacy profile with the more expensive parenteral medication.<sup>[8]</sup> However, the oral option which could have been tried to reduce the financial burden and enhance compliance could not suffice in the case

of this patient due to the small bowel resection. There is need for patient-centered care that will incorporate community service to avert avoidable death or morbidity from treatable complications of care.

In this index patient, there was bowel resection involving distal ileum and he subsequently developed megaloblastic anemia four years after the surgery. The findings in this patient corroborate with the fact that patients who had bowel resections may not be able to absorb vitamin B12 and will invariably develop megaloblastic anemia in future as soon as the body store in the liver is exhausted which usually takes 2–4 years.<sup>[5]</sup>

## CONCLUSION

Megaloblastic anemia is a rare complication of small bowel resection which may present up to 4 years postoperation. There should be of plan for hematologic follow-up for this group of patients for prompt diagnosis to reduce mortality and morbidity from this treatable complication of small bowel resection.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient has given his consent for his images and The patient understood that his name and initials will not be published and effort were made to conceal his identity but anonymity cannot be guaranteed.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

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