Article published online: 2023-04-17

Multiple Small Bowel Intussusceptions in the Setting of Anabolic Steroid Use

Alex Davies[1] Michael Sangiorgio[2] Ashwin Patwardhan[3]

[1] Department of Medical Services, Royal Hobart Hospital, Australia
[2] Department of General Medicine, Royal Hobart Hospital, Australia
[3] Department of Gastroenterology, Royal Melbourne Hospital, Australia

Address for correspondence Ashwin Patwardhan, MBBS, Department of Gastroenterology, Royal Melbourne Hospital, Australia (e-mail: Ashwin.s.patwardhan@gmail.com).

J Gastrointestinal Abdominal Radiol ISGAR 2024;7:79–81.

Abstract

Adult intussusception is a rare phenomenon and often provides a unique diagnostic challenge, typically involving extensive investigation to rule out sinister pathology. We present the case of a healthy 28-year-old male, who presented with symptoms suggestive of small bowel obstruction. Computed tomography displayed evidence of a small bowel intussusception; however, thorough investigation was unremarkable, besides a marked polycythemia. The patient represented several months later with another bowel obstruction, at which time he disclosed the regular use of androgenous anabolic steroids (AAS), which are recognized to induce polycythemia. AAS increase the risk of thromboembolic events and have more recently been implicated as a risk factor for intussusception. This case aims to highlight the increasing prevalence of AAS use, and the importance of its consideration in diagnostic dilemmas, particularly in otherwise healthy adults presenting with intussusception.

Keywords
- anabolic
- bowel
- intussusception
- steroids

Introduction

Intussusception is a rare phenomenon in adults, accounting for just 1 to 5% of all bowel obstructions.[1] The majority of cases have an identifiable lead point, with neoplasms accounting for two-thirds of cases, 50% of which are malignant. Benign differentials for adult intussusception are varied, including postoperative adhesions, infections, and anatomical anomalies.[2]

Our case involves a healthy 28-year-old male, who after extensive investigation was found to have none of the above. He did, however, report a history of anabolic steroid use; this has been postulated as a cause of adult intussusception, and was first described by Cavanagh et al in 2015, and then in two further cases.[3–5] Given increasing rates of anabolic steroid use, in young adults presenting with small bowel intussusception without a clear mechanical cause, androgenous anabolic steroids (AAS) use should be considered as a possible etiology

Case Report

A 28-year-old male presented to the emergency department of a metropolitan hospital with severe abdominal pain. He reported a 3-day history of gradually increasing abdominal pain that was sharp in nature, with associated nausea, vomiting, and constipation.

Computed tomography (CT) of the abdomen demonstrated multiple areas of small bowel intussusception. He was extensively investigated, with concern for a small bowel lymphoma. Carcinoembryonic antigen levels, lactate dehydrogenase levels, and chromogranin A levels were all normal. Serum hemoglobin was elevated at 154 g/L with a hematocrit of 0.47 L/L. Helicobacter pylori testing, human immunodeficiency virus serology, celiac testing, and flow cytometry were all negative. Push enteroscopy found possible thickening of the jejunal folds, but no mucosal abnormality, and no histological evidence of lymphoma. He then had a diagnostic laparoscopy

article published online
April 17, 2023

DOI https://doi.org/10.1055/s-0043-1763482.
ISSN 2581-9933.

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Fig. 1 Computed tomography of the patient's abdomen taken during the initial presentation. This demonstrates multiple (at least 5) areas of small bowel intussusception, the longest a 10-cm segment of jejunojejunal intussusception. A 79 mm × 69 mm × 63 mm heterogeneous soft tissue mass is seen at the apex of the intussusceptions, originally thought to represent small bowel lymphoma, however, this was later ruled out.

2 months later which found no clear pathological lead point (►**Fig. 1**).

His past medical history included only a single episode of acute alcoholic pancreatitis, with no significant comorbidities. He did, however, report using numerous recreational and nonprescribed medications including methylenedioxymethamphetamine, codeine, pregabalin, tapentadol, and intravenous cocaine. He is also an avid weightlifter and used anabolic steroids year-round, including testosterone, fluoxymesterone, and (most recently) methyltrienolone.

He began using AAS at the age of 21, with consistent use up to hospital presentation. He had trialled multiple agents, but most recently commenced methyltrienolone, approximately 5 months before presenting. He reported side effects including abdominal pain and nausea that initially prevented him from adhering to a consistent dosing schedule; however, he reported administering three doses per week for 2 weeks prior to presenting to hospital.

He then ceased the methyltrienolone and remained off it for a few months after his hospital admission, during which period he was asymptomatic, having no abdominal pain, nausea, or constipation.

He then recommenced the methyltrienolone, and after 3 weeks of regular dosing he represented to hospital, with severe abdominal pain, nausea, vomiting, and constipation.

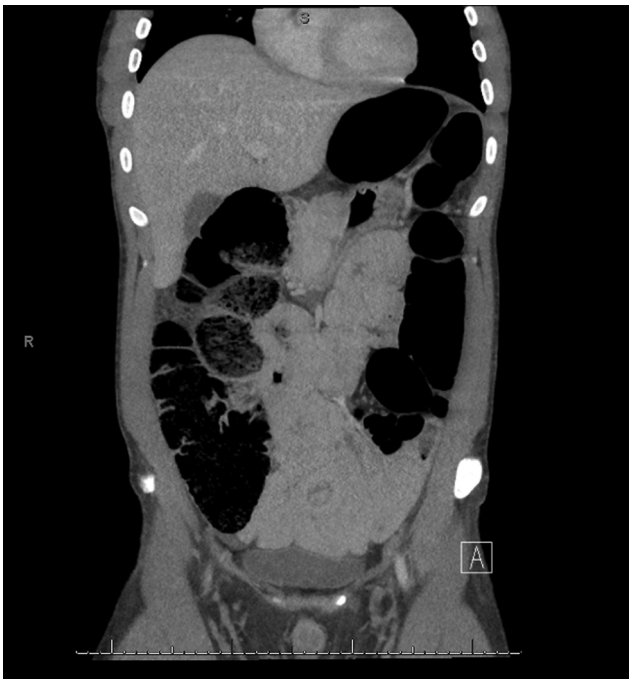

Fig. 2 Coronal computed tomography (CT) imaging of the abdomen taken during the most recent admission. Demonstrates unchanged circumferential thickening of the small bowel wall with ileal-ileal intussusception. Also demonstrates a markedly distended colon and fecal loading with no clear transition point.

On representation he was hemodynamically stable, with a mildly distended, but diffusely tender abdomen. Blood samples showed an elevated hemoglobin at 169 g/L with a hematocrit of 0.51 L/L, a leukocytosis of 16.9 /nL, a neutrophilia of 13.7/nL, and a mildly raised C-reactive protein at 28 mg/L. CT of the abdomen and pelvis once again demonstrated small bowel intussusception, as well as a markedly dilated colon, with significant fecal loading in the ascending and proximal transverse colon (►**Fig. 2**).

His pseudo-obstruction was successfully treated with neostigmine (a cholinergic medication, which indirectly acts on nicotinic and muscarinic receptors). Administration induced multiple large bowel motions, after which his symptoms completely resolved. He was discharged the following day.

He was followed up in clinic 2 months later and reported complete resolution of his symptoms, and had not taken any anabolic steroids since discharge.

Discussion

It is well documented that AAS use carries an increased risk of thromboembolic events particularly myocardial infarction, stroke, and pulmonary embolism.[6] Anabolic steroids have several effects that increase the risk of thromboembolic events, including increased platelet aggregation,[7] direct endothelial damage, and changes to lipid metabolism.[8] AAS use has also been reported to cause erythrocytosis, resulting in a secondary polycythemia and increased blood viscosity, further increasing the risk of thromboembolic events.[9] Our patient had a markedly elevated hemoglobin during both presentations, at 154 and 169 g/L, respectively,

with corresponding raised hematocrits of 0.47 and 0.51 L/L. Mesenteric ischemia from AAS use could theoretically result in bowel wall thickening, which could then act as a mechanical lead point for intussusception. With no other lead point identified, it is likely that our patient's intussusception was secondary to his AAS use. This theory was first described by Cavanaugh et al in 2015 and again by De Robles et al in 2020 and Goyal et al in 2020.[3–5]

AAS use is a growing public health concern, with significantly increased use among both professional and amateur athletes being reported throughout the United Kingdom and United States. McVeigh and Begley estimate the prevalence of AAS use in the United Kingdom has risen from 1.88 per 1,000 population in 1995 to 5.72 per 1,000 population in 2015.[10,11] Of further concern is the fact that patients taking AAS are unlikely to disclose this to their physicians. Pope et al also suggest that physicians rarely question patients on AAS while obtaining routine histories,[12] which could lead to underreporting of AAS use and lack of consideration of AAS use as a possible contributor in atypical clinical presentations of thromboembolic events.

AAS use is on the rise and while many adverse effects are well documented, some clinical sequelae are not clearly understood. While AAS use is an increasingly recognized risk factor for ischemic heart disease and cerebrovascular events, our case highlights a unique diagnostic and management challenge. Given the increasing prevalence of AAS use, and patient tendency to underreport use, AAS use should be considered in otherwise healthy adults presenting with small bowel intussusception without a clear lead point.

Conflict of Interest
None declared.

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