**CASE REPORT**

**PAEDIATRIC ILEOCOLIC INTUSSUSCEPTION ASSOCIATED WITH SARS-COV-2 INFECTION**

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**Abstract**

Paediatric intussusception is the most common cause of intestinal obstruction in paediatric population. Since 2019, the global pandemic caused by SARS-CoV-2 infection has significantly impacted worldwide healthcare. It has variable manifestations such as respiratory and extra-respiratory manifestations, and paediatric intussusception has been reported as one of the rare gastrointestinal manifestations of COVID-19. Though COVID-19 is mainly associated with respiratory manifestations, paediatric population may present with gastrointestinal symptoms such as vomiting, diarrhoea, abdominal pain and poor oral intake, before or with the onset of respiratory symptoms. Paediatric intussusception in COVID-19 is uncommon, and the initial presentation may be mistaken not as gastrointestinal manifestation of COVID-19. It is important for physicians to have a high clinical suspicion, especially in paediatric population, to differentiate between these entities. Early recognition and prompt intervention can improve patient care and prevent complications. This case also raises the possibility of role of SARS-COV-2 virus in etiopathological cause of paediatric intussusception. Here, we report a case of paediatric ileocolic intussusception in a patient with SARS-CoV-2 infection.

**Keywords:** Intussusception, Ileocolic, SARS-CoV-2, COVID-19, Paediatrics

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**Introduction**

Intussusception occurs when a proximal segment of the intestine is invaginated or telescoped to an adjacent distal part. It commonly occurs in patients between 4 and 36 months of age presenting as paediatric intestinal obstruction and abdominal emergency in paediatric population. Intussusception classically presented with triad of abdominal pain, palpable abdominal mass, and bloody stool (i.e., "red currant jelly stool").[1]. Lethargy, vomiting, and irritability are also common presenting complaints. The aetiology of intussusception is usually idiopathic, with several predisposing factors, such as viral infection, contributing to paediatric intussusception pathophysiology. [2] Since the emergence of COVID-19 worldwide, they were 64 reported cases of paediatric intussusception with confirmed SARS-CoV-2 infection.[3]

**Case presentation**

A seven-month-old full-term boy with no significant medical history, and normal developmental milestones, presented to our emergency department with a 2-day history of abdominal distention, vomiting, poor oral intake, and constipation. He developed fever episode for three days prior to the presentation and have had visited to the local clinic a day before, where he was positive for SARS-CoV-2 infection.

On examination, he was looking lethargic, has consolable crying. The vitals showed with a well perfused child with heart rate of 130 beats per minute and normal baseline respiratory rate, temperature and blood pressure. The patient's abdomen was soft and distended without any palpable masses. Digital rectal examination revealed a ‘red currant jelly’ stool. His laboratory blood tests showed a normal leucocyte

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count, renal profile, electrolyte, and blood gas values. His chest radiograph was normal, and, however, the abdominal radiograph showed dilated small bowel (Figure 1).

With the above history, the patient’s age, and the clinical presentation, a provisional diagnosis of intussusception was made. Abdominal ultrasound examination did not show pseudo kidney or target sign appearance. Computerised Tomography (CT) abdomen (Figure 2) revealed the presence of long segment bowel invagination within the bowel (bowel-within-bowel configuration), target sign, and the prolapsing part of the bowel or the intussusceptum was continuous with dilated, fluid-filled small bowel. The receiving bowel or the intussuscipiens appeared to be continuous with the collapsed ascending colon, suggestive of ileocolic intussusception.

Non-surgical treatment of hydrostatic reduction was performed using saline water and foley catheter via rectum under ultrasonographic guidance. This reduction method was unsuccessful as the intussusceptum failed to reduce. Urgent laparotomy was performed and the ileocolic intussusception (20 cm until caecum) was confirmed with 4 polyps noted as lead point. This was followed by the small bowel resection with anastomosis. He was then discharged with outpatient follow-up on postoperative day 11.

Discussion

There are various clinical manifestations of SARS-CoV-2 infection in children ranging from respiratory, gastrointestinal, renal, cardiovascular, and renal symptomatology. The most common gastrointestinal presentation in children is vomiting, diarrhoea, and abdominal pain. Although paediatric intussusception associated with COVID-19 is rare, it can manifest without any respiratory symptoms [4]. A meta-analysis shows a very low incidence of intussusception in paediatric population infected with SARS-CoV-2.[3]; but high index of suspicion in paediatric population presenting with gastrointestinal manifestation can help in the early detection and treatment of intussusceptions.

Most of paediatric intussusception is idiopathic, and the exact mechanism of how SARS-CoV-2 virus causes intussusception is not well understood. Previous literature have documented an association between viral pathogens such as adenovirus and rotavirus with the development of intussusception. It is hypothesised that the preceding infection causes the hyperplasia of intestinal lymphoid tissue and Peyer patches, which acts as the lead point for intussusception to occur [5]. Intussusception has associated with SARS-CoV-2 infection, raising the possibility of SARS-CoV-2 triggering the inflammatory responses of the intestinal lining and contributing to the development of intussusceptions. [6]

Laboratory abnormalities for most intussusception cases may reflect leucocytosis (may indicate perforation or gangrene process), dehydration, and electrolyte abnormalities (due to vomiting) [7-9]; but normal laboratory investigation does not exclude intussusception. An unremarkable plain abdominal radiograph also does not exclude intussusception as this is neither sensitive nor specific to diagnose the condition. However, intestinal obstruction and soft
tissue mass may be a predominant feature. Abdominal ultrasonography is the gold standard for the evaluation of suspected paediatric intussusception, yielding high sensitivity and specificity of 97% [10]. Ultrasound may show a ‘target/doughnut sign,’ ‘pseudo kidney’ sign, free fluid, or lead point. Though CT abdomen is the modality of choice in adult cases of acute abdomen, in paediatric population, it is usually done in selected cases where the ultrasound finding is inconclusive [11] or when an abdominal mass or a lead point is suspected, as CT scan procedure carries the risk of sedation, radiation, and intravenous contrast.

The primary management of intussusception is the reduction of the intussusception segment. An acute paediatric intussusception with stable haemodynamic component, patients are treated by non-surgical procedures (pneumatic or hydrostatic reduction) with a success rate of 70-90% and the recurrence in approximately 10% of cases after successful non-surgical reduction [12,13]. Surgical reduction is usually performed in failed pneumatic/hydrostatic reduction, hemodynamically unstable patients, or those with signs of intestinal perforation or peritonitis.[14]. This patient’s intussusception was detected early and prompt intervention to patient care is crucial. It is important to avoid delayed presentation or misdiagnosis of intussusception due to multiple co-morbidities such as perforation, sepsis, multi organ failure and even death.

Conclusion
The SARS-CoV-2-associated intussusception can present without respiratory symptoms. A high index of clinical suspicion, detailed history taking, thorough physical examination, and prompt intervention are essential to improve patient care. Paediatric intussusception should be considered while dealing with acute abdomen in SARS-CoV-2 infection.

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Conflict of interest
The author declare that they have no conflict of interest regarding the publication of this case report.

Ethical clearance
Informed consent for the usage of image and content for publications was obtained from the patient’s caretaker.

References