



Is Intussusception in an Adult with Active COVID-19 Infection a Surprise?

Marwa Gargouri^{1,2} · H ela Gargouri³ · Houda Ghorbel¹ · Ahmed Tlili⁴

Received: 2 March 2022 / Accepted: 7 May 2022
  Association of Surgeons of India 2022

Abstract

The severe acute respiratory syndrome coronavirus 2 (SARS COV2) had rapidly spread and caused a global pandemic worldwide. The most common symptoms in adults are respiratory with dry cough, dyspnea, and fever. Occasionally, extra-respiratory presentations may be seen such as gastrointestinal involvement with diarrhea, vomiting or abdominal pain. Acute intestinal intussusception is the most common cause of bowel obstruction in infants (2–4 months of age) but rarely could it be encountered in adult. It is a very rare gastro-intestinal manifestation of COVID-19 with an invagination of a segment of the bowel within a more distal one. The part that prolapses into the other is called the intussusceptum, and the part that receives it is called the intussusciens. Most of COVID-19 cases of AII are reported in the pediatric population between 4 and 10 months. Only a single case of small bowel obstruction secondary to ileo-colic intussusception in a COVID-19 infection adult was published on April 2021. We present here a challenging case of intussusception secondary to COVID-19 infection in an adult in the absence of respiratory symptoms. Our study presents the first case in Africa of AII in adult patients due to COVID-19.

Keywords SARS COV 2 · Intussusception · Adult · Gastro-intestinal manifestations

Abbreviations

ACE2	Angiotensin-converting enzyme 2
AII	Acute intestinal intussusception
SARS COV2	Severe acute respiratory syndrome coronavirus 2
COVID-19	Coronavirus disease 2019
GI	Gastro-intestinal
IV	Intravenous
mg/l	Milligram per liter
mmHg	Millimeter of mercury

PCR	Polymerase chain reaction
US	United State of America

Introduction

The first case of Coronavirus disease 2019 (COVID-19) began in Wuhan, China on December 2019, and had rapidly spread worldwide [1, 2]. Although respiratory symptoms are characteristics in adults, gastro-intestinal (GI) manifestations have been documented to occur more frequently in children [3, 4]. Diarrhea, vomiting, and abdominal pain are usual gastrointestinal symptoms that occur in 6.6% to 18% of pediatric patients with SARS CoV2 infection [5]. AII is a very rare COVID-19 symptom [3]. Some case reports of acute intestinal intussusception (AII) have been revealed in children as a manifestation of COVID-19 within the literature. Intussusception is the most common cause of bowel obstruction in infants, most commonly occurring between the ages of 4 and 10 months [4]. Viral illnesses are known to cause intussusception. Its incidence ranges between 0.24 and 2.4 per 1000 live births, while the mortality rate is 2.1 per 1 million live births in the USA. However, case fatality rates are much higher in Africa (9.4%) [4]. Intestinal

  H ela Gargouri
hela.gargouri@usf.tn

- ¹ Department of Infectious Diseases, Mohamed Sassi University Hospital, Gabes, Tunisia
- ² Department of Life Sciences, Research Laboratory of Environmental Toxicology-Microbiology and Health (LR17ES06), Faculty of Sciences of Sfax, University of Sfax, Sfax, Tunisia
- ³ Laboratory of Molecular and Cellular Screening Processes, Centre of Biotechnology of Sfax, University of Sfax, Sidi Mansour Road Km 6, BP 1177, 3018 Sfax, Tunisia
- ⁴ Department of Surgery, Mohamed Sassi University Hospital, Gabes, Tunisia

intussusception is rare in adults and represents only 1% of intestinal obstructions.

Worldwide, many pediatric cases of AII secondary to COVID-19 have been reported. Only Jackson et al. was the first documented case worldwide of ileo-colic AII in an adult with active COVID-19 infection [6].

We present here the first case of jejuno-jejunal AII as a gastro-intestinal manifestation of COVID-19 in an adult man in Africa with a favorable outcome.

Case Report

A 51-year-old man, without a relevant medical history, presented to the emergency department with complaints of episodic abdominal pains and vomiting for 5 days. No histories of respiratory symptoms or blood in the stool were reported.

The patient was conscious, asthenic with fever of 39 °C and blood pressure of 120/60 mmHg. The pulse was 108 per minutes, respiratory rate was 20 and oxygen saturation was 98% on room air. Physical examination revealed a soft abdomen with mild generalized tenderness on palpation. Inflammatory markers were raised C-reactive protein level was 223 mg/l and white cells count level of $17.7 \times 10^3/\mu\text{l}$ with 65% neutrophils. Renal and liver markers were unremarkable. The diagnosis of AII was confirmed by the abdominal computed tomography scan with intravenous contrast showing dilatation of the small bowel with jejuno-jejunal intussusception (Figs. 1 and 2).

His nasopharyngeal swab was tested positive for SARS COV2 using polymerase chain reaction.

The patient was admitted in the COVID-19 unit. After intubation and exploratory laparotomy, necrosis of the

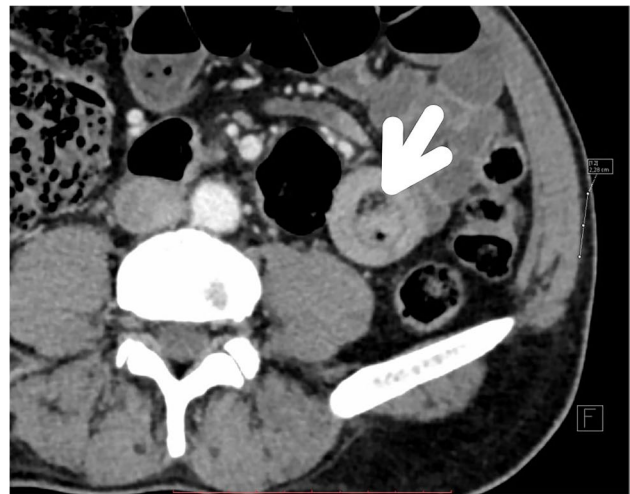


Fig. 2 Computed tomography scan (axial images) showing jejuno-jejunal intussusception arrow: jejuno-jejunal intussusception

small intestine was found, and jejunal resection followed by jejunio-jejunal anastomosis was performed. The anesthesiology team, all surgical and nursing staff wore a single-use N95, a face shield, goggles, a gown, and double gloves. The histological findings were dominated by ischemic necrosis, hemorrhage, edema and moderate lymphoid hyperplasia. Our patient was treated with vasoactive substances (dopamine) to improve circulation, antibiotics (cefotaxime and metronidazole), a methylprednisolone intravenous drip, and anti-thrombotic treatment.

After full recovery, the patient was discharged on postoperative day 5 without complications.

Discussion

According to our literature review, this is the first case such instance of SARS COV2 positive adult patient presenting with jejuno-jejunal AII as the primary manifestation. Jackson et al. showed the first case of ileo-colic intussusception in adult with COVID-19 infection [6]. Incidences of ileo-ileal and Jejuno-jejunal intussusception are considerably lower, compared to ileo-colic intussusception [7]. Worldwide, there are a few numbers of published pediatric cases with intussusception in children aged between 4 and 10 months as a gastrointestinal manifestation of COVID-19 infection [1, 3–5, 8, 9]. The exact pathological mechanism leading to the complication of AII in COVID-19 is not well understood.

Intussusception may be caused by anatomical causes, associated diseases and viral infections. Approximately 30% of pediatric intussusception cases have a preceding viral illness. Adenovirus and Rotavirus, Coronavirus, along with

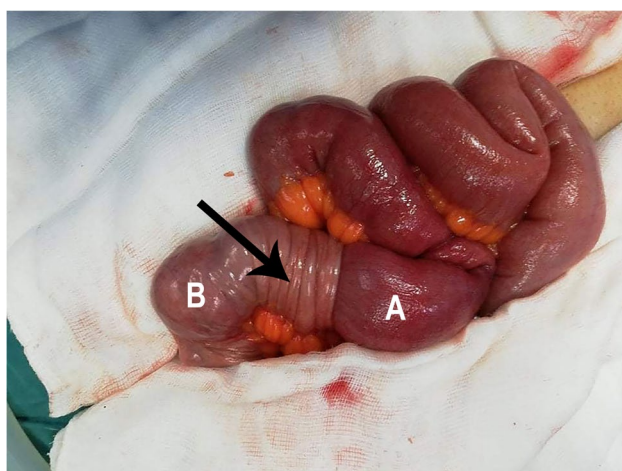


Fig. 1 Jejuno-jejunal intussusception Legend 1: Abdominal laparotomy showing a jejuno-jejunal intussusception extended over 4 cm in length with distended bowel above intussusception **A**. The intussusception **B**. The intussusciens Arrow: a jejuno-jejunal intussusception

some parasites, have been identified as agents which can cause intussusception. Infections can cause mesenteric lymphadenopathy and hypertrophy of Peyer patches, which can act as a lead point for the intussusception.

Infection of gut epithelial cells with local reactive mesenteric adenitis may explain this complication. In addition to that, it will be important to pay attention that the expression of angiotensin-converting enzyme 2 (ACE2) play the major role in coronavirus infection. In fact, the enzyme expression in cells is not exclusive to lung cells; it is present in the gastrointestinal tract, specifically in the epithelial tissue of the esophagus, ileum, and colon. Immunohistochemistry in human tissues had revealed the surface expression of the enzyme protein on enterocytes of small intestine.

In adults, Wang et al. reported that gastro-intestinal symptoms are rarely described as first manifestation of COVID-19 before developing respiratory symptoms (10.1%)[10]. Intussusception is a pediatric pathology and rarely observed in adult patients. It remains unclear why COVID infection adults appear less severely affected than child. It is suspected to be due to a combination of differences in immune system function as well as a variation of expression of the angiotensin-converting enzyme 2 receptor through which the virus infects. According to Jackson et al., in adults, approximately half of cases are secondary to malignancy requiring surgical intervention rather than endoscopic decompression which is the first-line treatment in pediatrics' patients [6]. We highlight the importance of paying attention to serious and less common clinical manifestations of SARS COV2 other than fever and dry cough. Patients may present atypically with episodic abdominal pain, diarrhea or darkened stools.

Conclusion

Our case presents that Coronavirus disease 2019 could be implicated in acute intestinal intussusception in adults' patients with non-specific gastro-intestinal symptoms. To date, it has been difficult to establish the association between the Coronavirus and acute intestinal intussusception. Front-line clinicians have to consider Coronavirus infection when dealing with gastrointestinal symptoms. When the pathology is diagnosed early, we have more chances for a successful management of the Coronavirus disease and avoidance of severe complications.

Our study is one example where with timely diagnosis and management can improve the outcomes of patients.

Acknowledgements This work was supported by the Ministry of health and the Ministry of Higher Education and Scientific Research of Tunisia. The authors are thankful to Mohamed Arbi BEN YOUNES, Oualid SBAI, Naoures ISSAOUI and Ichrak YAHYAOUI for providing necessary help.

Author Contribution Marwa GARGOURI and HÉLA GARGOURI analyzed the data and prepared the manuscript.

Marwa GARGOURI, Houda GHORBEL and Ahmed TLILI contributed to the collection and curation of patient's clinical information.

Funding The research was funded by the Ministry of Health and the Ministry of Higher Education and Scientific Research of Tunisia.

Declarations

Ethics approval and consent to participate Informed consent from all participants or their legal representatives was obtained in accordance with the guidelines of the Regional Ethics Committee, Gabes, Tunisia.

References

1. Cai X, Ma Y, Li S, Chen Y, Rong Z, Li W et al (2020) Clinical characteristics of 5 COVID-19 cases with non-respiratory symptoms as the first manifestation in children. *Front Pediatr*: 258
2. Pirola L, Palermo A, Mulinacci G, Ratti L, Fichera M, Invernizzi P, Viganò C, Massironi S et al (2021) Acute mesenteric ischemia and small bowel imaging findings in COVID-19: a comprehensive review of the literature. *World J Gastrointest Surg*: 702
3. Bazuaye-Ekwuyasi EA, Camacho AC, Saenz Rios F, Torck A, John Choi W, Aigbivbalu EE, Mehdi MQ, Shelton KJ, Radhakrishnan GL, Radhakrishnan RS & Swischuk L E et al (2020) Intussusception in a child with COVID-19 in the USA. *Emerg Radiol*: 761–764
4. Moazzam Z, Salim A, Ashraf A, Jehan F, Arshad M et al (2020) Intussusception in an infant as a manifestation of COVID-19. *J Pediatr Surg Case Rep*: 101533
5. Guerrón N and Figueroa LM (2021) Intussusception and COVID19, successful mechanic reduction, case report. *Global Pediatr Health*: 2333794X211019693
6. Jackson KM and Sabbota. AL (2021) Right hemicolectomy for ileocolonic intussusception in an adult with active COVID-19 infection: a case report. *J Surg Case Rep*: rjab205
7. Güney LH, Fakıoğlu E, Acer T, Ötgin İ, EArslan E, Akılı M S, Hiçsönmez A (2016) Is every intussusception treatment an emergency intervention or surgery?. *Ulus TravmaAcilCerrahiDerg*: 2
8. Makrinioti H, MacDonald A, Lu X, Wallace S, Jobson M, Zhang F, Shao J, Bretherton J, Mehmood T, Eyre E, Wong A, Pakkiri L, Saxena A, Wong G (2020) Intussusception in 2 children with severe acute respiratory syndrome coronavirus-2 infection. *J Pediatr Infect Dis Soc*: 504–506
9. Noviello C, Bolletini T, Mercedes R, Papparella A, Nobile S, Cobellis G et al (2021) COVID-19 can cause severe intussusception in infants: case report and literature review. *Pediatr Infect Dis J*: e437
10. Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, Wang B, Xiang H et al. (2020) Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus–infected pneumonia in Wuhan, China. *Jama* : 1061–1069

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.