

# Intussusception as a Manifestation of COVID -19

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## ABSTRACT

COVID 19 has created a havoc in the world and has brought the world to a standstill. Every day we get to learn something new about the powerful virus. COVID has different varied clinical presentations. Besides respiratory symptoms many children present with GI symptoms during this 2<sup>nd</sup> wave of COVID.

We present a case of a 10 year male child who presented with features of intussusception with a history of URTI 5 days prior to acute abdomen. Unlike other cases where children respond nicely to post operative conventional treatment, this child went downhill in spite of aggressive management in PICU. In view of ongoing pandemic and mother who was found to be COVID positive, a thought if the child could be suffering from COVID and its complications. Throat swab for RTPCR SARS CoV-2 was found to be positive and acute viral inflammatory markers were found to be highly elevated. A diagnosis of Severe COVID-19 with cytokine storm manifesting as intussusception was made.

All children with acute abdomen should be evaluated for COVID 19. Out of all the atypical manifestations, intussusception being one of the rare manifestations of COVID 19<sup>[1]</sup>.

**Key Words:** Covid, intussusception, cytokine storm, RTPCR

## INTRODUCTION

Intussusception is the most common cause of intestinal obstruction between 5 months and 3 years of life and the most common cause of abdominal emergency in less than 2 years children<sup>[2]</sup>. Approximately 90% of cases of intussusception in children are idiopathic<sup>[2]</sup>. Viral infections causing upper respiratory tract infections mostly with adenovirus Type C or following post Rota virus vaccination are one of the etiological factors<sup>[2]</sup>. Introduction of complementary feeds at around 6 months and infection predisposes to mesenteric lymphoid hyperplasia and swelling of Peyer's patches which can act as a lead point for intussusception. This leads to strong peristaltic activity, and telescoping of one mucosal segment into another. Ileocolic intussusception is the most common form<sup>[2]</sup>.

A case series of 5 pediatric patients presenting with non-respiratory symptoms was conducted in Wuhan, China. Case 1 of that series was of a 10-month-old female with intussusception who tested positive for SARS-CoV-2<sup>[3]</sup>. SARS-COV2 expresses the spike glycoprotein that binds with high affinity to ACE2 to enter host cells<sup>[4]</sup>. ACE2 is highly expressed in type 2 alveolar cells in lungs and in GIT especially absorptive enterocytes in ileum and colon<sup>[4]</sup>. There is increased GI wall permeability to foreign pathogens once infected by SARS COV2<sup>[5]</sup>. A postulation that the virus could have invaded the ACE2 receptors in intestine like in respiratory system thereby causing hypertrophy of Peyer patches leading to Intussusception could be thought of ! Besides vomiting, pain abdomen and diarrhoea, a rare abdominal presentation of Covid 19 being intussusception.<sup>[1]</sup>

## CASE DETAILS

Here we present a case of a 10 month old male child who presented to Pediatric ER as a case of acute abdomen with chief complaints of low grade fever, cold and cough for 1 day, 5 days back prior to hospitalisation, intermittent crying, multiple episodes of bilious vomiting and red currant jelly stools for 2 days.

There was no history of difficulty in breathing, hematemesis, seizure, altered sensorium or decrease urination. No history of previous hospitalisation, any chronic illness or H/O contact with TB. The child is a neurodevelopment normal child, has been immunised as per NIS and antenatal and birth history were insignificant. Child was on complementary feeding along with breast feeding. There was no significant family history.

On examination at time of admission, patient was found to be afebrile, conscious but irritable. Vitals were stable. Per abdomen examination was found to be tender, distended, bowel sounds were sluggish. There was no mass or organomegaly. Other system examination revealed no abnormality.

With above history and clinical findings, a provisional diagnosis of Intussusception was made. RAT for COVID done on a routine basis was negative. USG A/P done on emergency basis was S/O intussusceptions (Fig A).

On D2 hospitalisation, Pediatrics Surgery team operated the child and thereafter the child was shifted to PICU for post-op management. On D2 evening, Child was found to be drowsy, BP was on the low range, PP was feeble, some pallor was present. Dopamine at 7 ug/kg/min was started after adequate fluid bolus along with the other conventional treatment.

On D3, the child was found to be more pale, vitals being HR 200/ min, RR 57/ min, BP 60/ 27 mmHg, spO<sub>2</sub> 87% on room air, cold extremities, peripheral pulses feeble, CRT>3 secs along with presence of low grade fever, cold and cough. Investigations were repeated like CBC with

CPS and RFT to rule out HUS like condition and postop hemorrhage. Child was treated in line of septic shock by fluid bolus, oxygen at 3L/min through nasal prongs, inotropes and broad spectrum iv antibiotics. As Hb was < 9gm/dl, one BT @ 10 ml/kg given. On D4, child further deteriorated. Child was drowsy with features of autonomic dysfunction. Child also had irregular heart beat, ectopic beats. Antibiotics were upgraded to Inj. Meropenem and Clindamycin. Aggressive management continued and continuous monitoring was done. Pediatric Surgery consultation was taken. Despite aggressive and prompt management the child deteriorated. The doctors were put in a diagnostic dilemma as none of the standardised treatment worked. On D5, Meanwhile the mother of the child who was present with the child throughout hospitalisation was found to have suffering from COVID like symptoms for past 2-3 days. She was tested for Covid RAT and found to be positive (FIG B). She was sent for home isolation with proper medical advice. This was the turning point where the Question was we dealing with a case of COVID triggered intussusception. Is it COVID cytokine storm which was causing this delayed recovery? In view of ongoing pandemic and non response to treatment, COVID workup was done. Child's RTPCR for COVID 19, anti COVID IgG (FIG C) was sent immediately along with other viral inflammatory markers. Inflammatory markers were found to be highly elevated. Injection Methylprednisolone @ 1mg / kg /dose BD along with Inj. Enoxaparin @ 1 mg/dose SC BD was started. On D8, Child showed dramatic signs of improvement, ionotropes were tapered, oxygen stopped and NGT feeding was started. On D7 RTPCR for Covid was positive. Child was isolated. A diagnosis of severe form of COVID 19 with cytokine storm was made. Surgical drain removed and dressing done. He gradually recovered and was discharged successfully (Fig D).

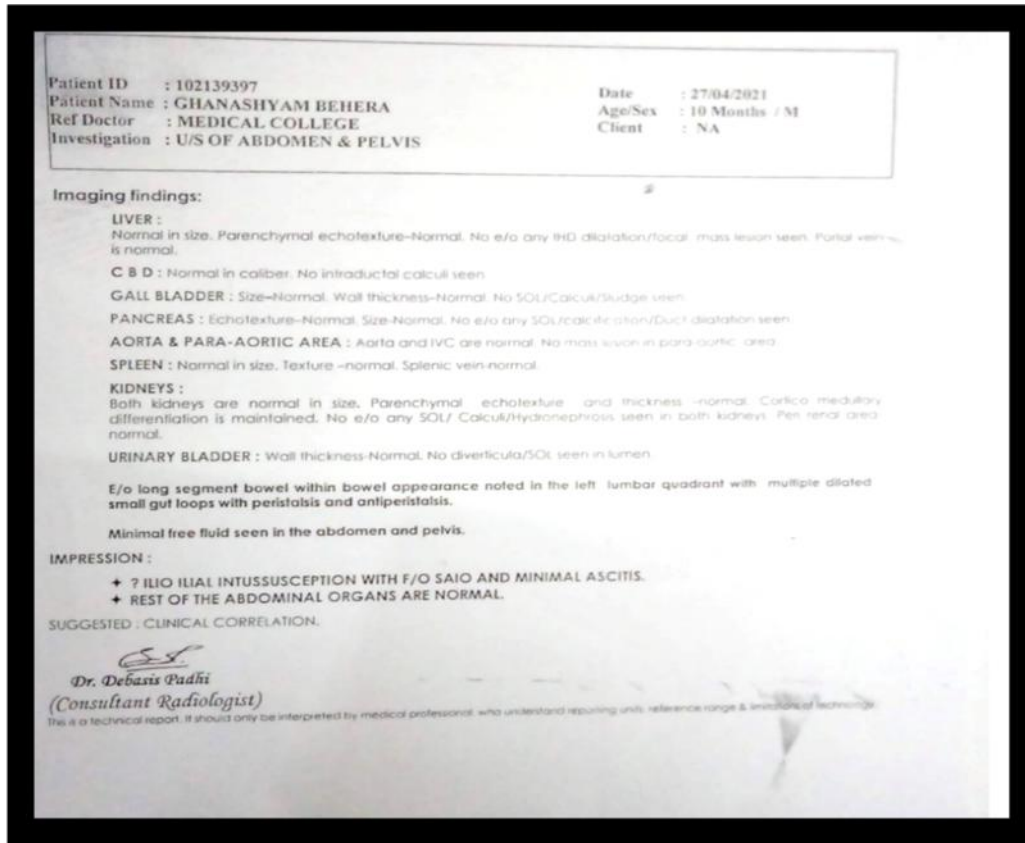


Fig A : showing Ilio ilial intussusceptions

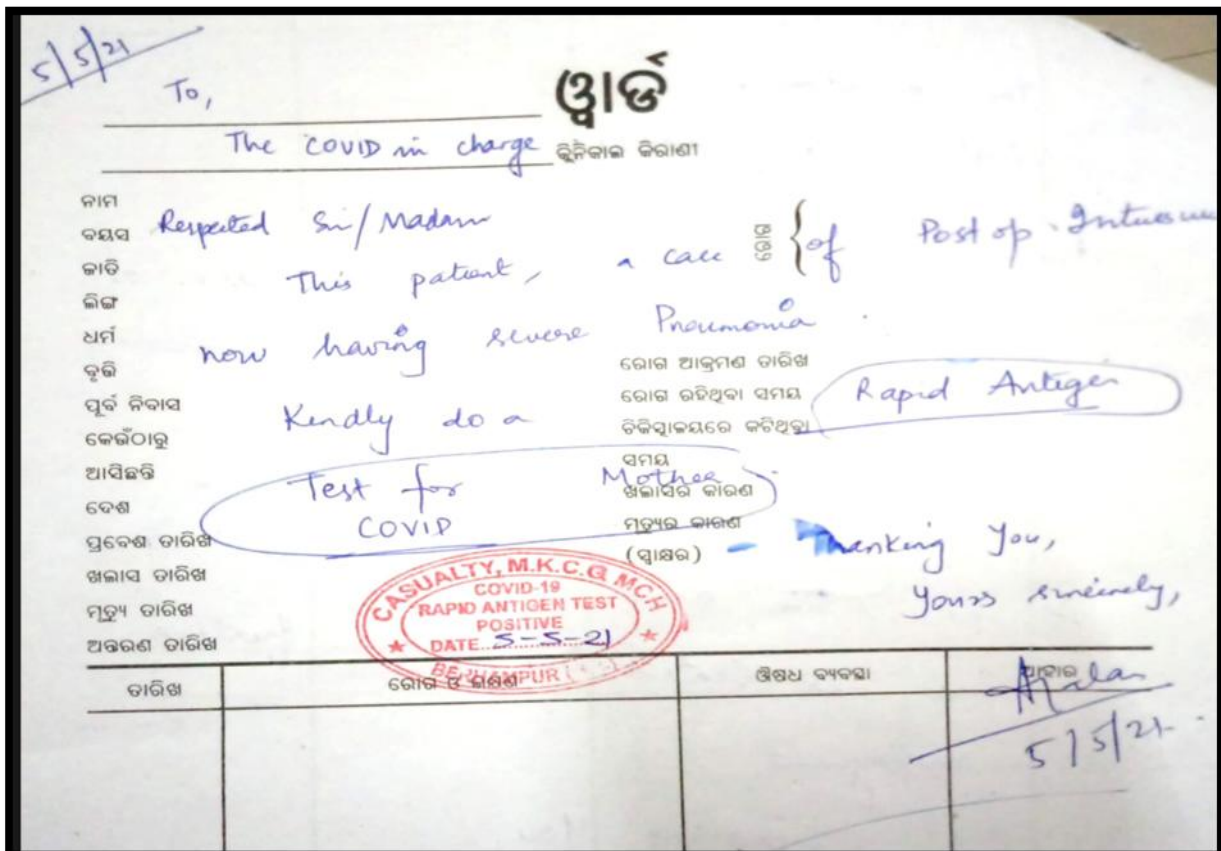


Fig B : showing COVID RAT of mother positive

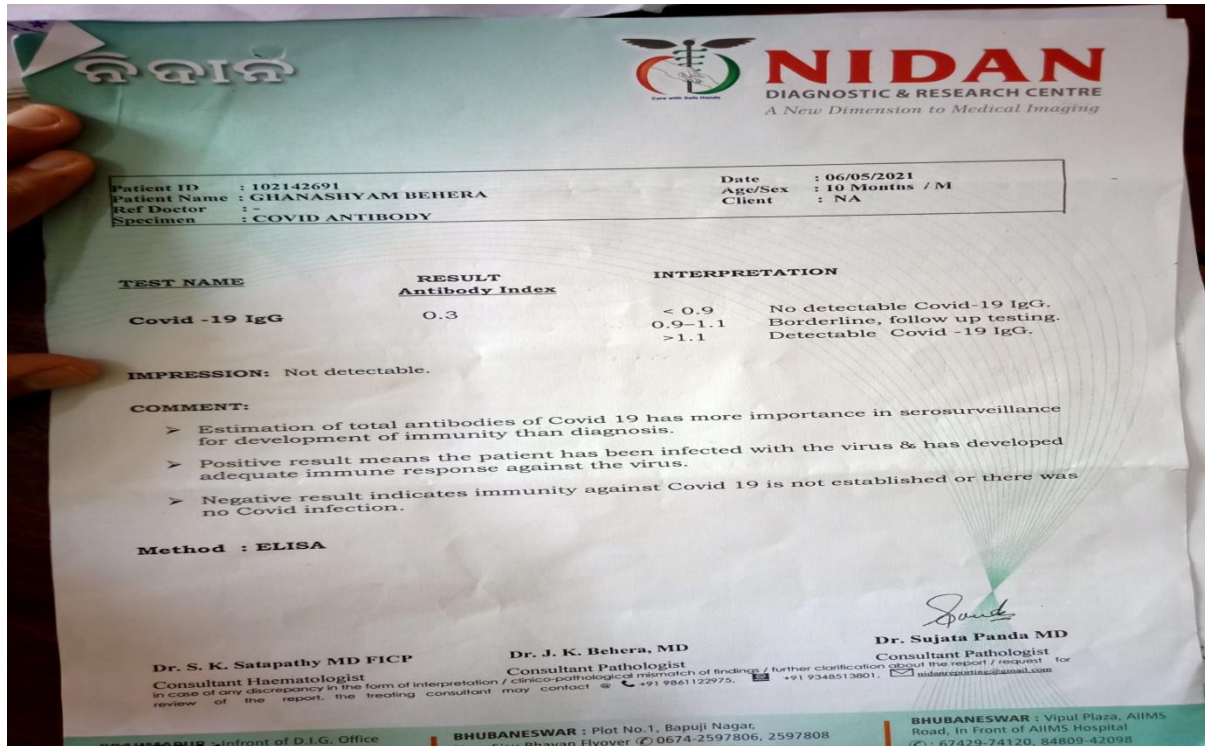


Fig C : showing COVID 19 IgG Negative

TABLE 1 showing elevated inflammatory markers

Investigations	Results D5 hospitalisation	Results D8 hospitalisation
CRP(Q) (0.0 – 6.0mg/l)	7.30	0.57
Serum Ferritin	> 750	257.02
D- Dimer (0.0-0.5mg/l)	7.17	4.0
LDH (225- 450 u/l)	2095	1605



Fig D : showing BABY at time of discharge

## DISCUSSION

Unlike respiratory symptoms, abdominal symptoms are more common presentation of COVID 19 in children. Children suffer from milder infections due to COVID 19 unlike adults [6]. As

postulations about 3<sup>rd</sup> wave of COVID 19 affecting children has been made. Therefore paediatricians should be more alert to such atypical manifestations. Only strong suspicion, timely diagnosis and prompt treatment can save the life of such patients.

Evidence regarding COVID 19 is still evolving. We should keep in mind COVID 19 in patients who present with increasing inflammatory markers and abdominal symptoms. ACE2 receptors which are present in the brush border of intestinal mucosa are the key inflammatory regulators in intestine [1]. The entry of virus invades the ACE2 receptors in intestine causing inflammation and widespread immune activation. This leads to mesenteric lymphoid hyperplasia and hypertrophy of intestinal Peyer's patches [7]. There is delay in peristaltic activity in the gut leading to telescoping of adjacent bowel loops into each causing intussusception [8]. Therefore pediatricians and surgeons should be conscious about the fact that intussusception and acute abdomen are one of the presentation of COVID in children [7].

Eseoma et al in USA reported the fourth case of intussusception as a rare manifestation of COVID 19 in the world [9]. Lu et al presented a case of a 10 month old infant with intussusception who progressed to multiorgan dysfunction and succumbed in 4 weeks [10]. Unusual presentation of COVID 19 as intussusception by Lalita Rajalakshmi et al presented a case on a 8 months old infant with features of intussusception and fever without respiratory symptoms who improved after pneumatic reduction [5]. In Cai et al. study patient needed exploration laparotomy with resection and anastomosis of necrotic small intestine and later succumbed due to multiorgan failure. [3]. Patient in Moazzam et al. recovered well and was discharged 7 days after reduction [7].

Our index child initially had initial URTI like symptoms prior to GI symptoms and a strong contact history with COVID positive mother. His COVID 19 RTPCR positive reports with highly raised inflammatory viral markers and the response to COVID treatment were pointers to this atypical rare manifestation of COVID 19. Covid 19 caused initial URTI, invaded the ACE2 receptors in gastrointestinal tract with its spike glycoprotein thereby causing

widespread activation and inflammation. Child improved after starting steroids and low molecular weight heparin. During the ongoing pandemic, COVID-19 must be considered in patients with increased inflammatory variables and abdominal symptoms [11]. So we conclude this case as intussusception with COVID 19 positive but exact casual association is yet to be established [12]. More studies and reports are needed to establish the causality.

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