

## **A Child Presenting with Respiratory and Circulatory Compromise Secondary to Gross Constipation**

S. Mohamed<sup>1</sup>, A. Rodriguez Herrera<sup>1</sup>, R. Okumu<sup>2</sup>, M. Akram<sup>3</sup>

1. Paediatric Department, St. Luke's General Hospital, Kilkenny, Ireland.
2. Radiology Department, St. Luke's General Hospital, Kilkenny, Ireland.
3. Paediatric Department, University Hospital Waterford, Waterford, Ireland.

### **Abstract**

#### **Presentation**

We describe the unusual implications of long-standing constipation in a child presenting with respiratory and circulatory compromise.

#### **Diagnosis**

His abdominal and chest x-rays were very remarkable for gross constipation resulting in inadequate lung expansion.

#### **Treatment**

He initially received supplemental oxygen and an intravenous bolus of Normal saline for management of shock and was subsequently started on laxatives.

#### **Conclusion**

The respiratory and cardiovascular compromise occurred secondary to the progressive increase in intra-abdominal pressure.

### **Introduction**

Children with long standing constipation can develop serious sequelae if left untreated. We discuss the case of a child presenting with respiratory and circulatory compromise secondary to long standing constipation.

## Case Presentation

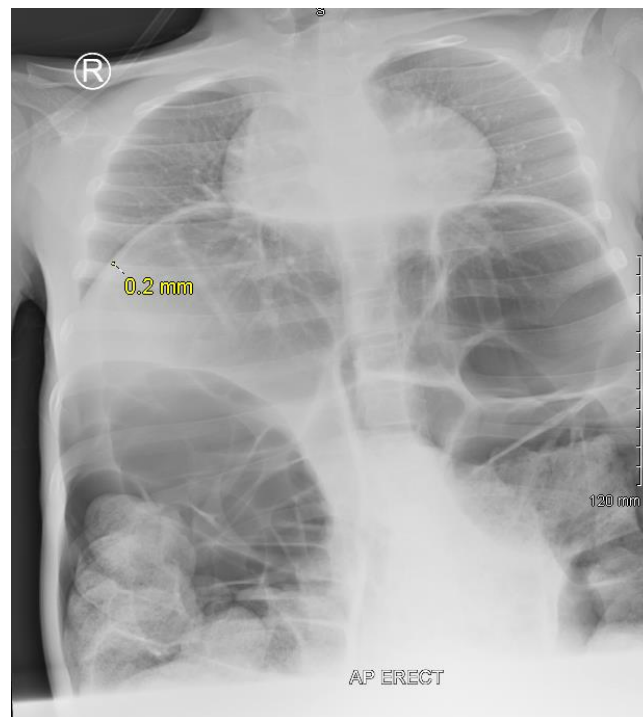
A 14 years old boy presented to our Emergency department with abdominal distension and shortness of breath. The abdominal distension was intermittently occurring for the previous 2 weeks. He was also complaining of abdominal pain and reduced appetite.

He had a past history of constipation not managed by any medications, occasionally associated with overflow soiling. He mentioned that lying down and passing flatus had given him some relief. He was passing urine normally.

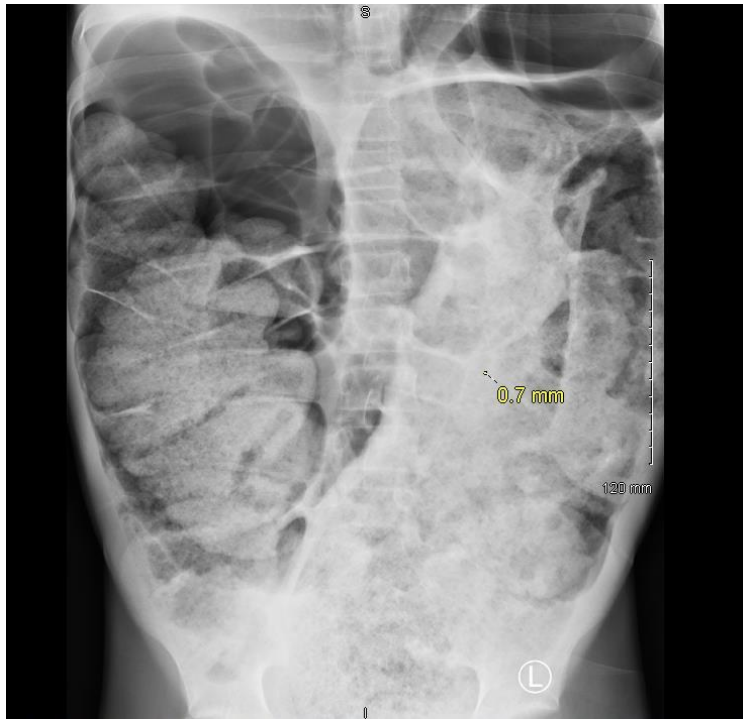
On assessment he was alert but pale looking, he was distressed but able to talk. He was afebrile, his heart rate was 136/min, blood pressure was 136/76, respiratory rate was 26/min, oxygen saturations were 98% in room air.

Abdominal exam showed a massively distended abdomen, tense on palpation. An abdominal mass was felt in the left lower quadrant that was non tender, there was no visceromegaly. Examination of the perianal area was difficult due to soiling, but no abnormalities were found on exam. The rest of his systemic examination was unremarkable.

His initial investigations including full blood count, renal and liver function tests were normal. Coeliac screen and thyroid function tests were also normal.



**Figure 1:** Chest and abdominal x-rays on day 1 of admission showing inadequate lung expansion. The distended loops of colon in the upper abdomen caused elevation of the diaphragm, consistent with splinting of the diaphragm.



**Figure 2:** Abdominal x-ray on day 1 of admission showing marked faecal loading of the colon and rectum with marked dilatation of the large bowel.

His initial chest x-ray (Figure 1) and abdominal x-ray images (Figure 2) showed marked faecal loading of the colon and rectum with marked dilatation of the large bowel. The distended loops of colon in the upper abdomen caused elevation of the diaphragm, consistent with splinting of the diaphragm. The lungs showed inadequate expansion, however there was no major collapse or consolidation.

He initially received supplemental oxygen and an intravenous bolus of Normal saline for management of shock as he was pale and tachycardic then he was started on intravenous maintenance fluids. His heart rate started normalizing following the bolus.

He was appropriately started on laxatives.

He passed a large soft stool after which his abdominal girth was noted to decrease. He continued to pass semi solid stools during his admission with significant improvement of his symptoms.

Repeated x-ray images on day 3 of admission showed significant improvement in the aeration of the lung bases. There was marked interval reduction in the colonic dilatation in the upper abdomen since the previous x-ray despite the persistence of extensive faecal loading of the colon and rectum.

He was discharged home on day 6 of admission and advised to continue regular laxatives. He was reviewed 3 weeks later at the outpatient's department and had remained well, therefore the laxatives were weaned off gradually. His case was discussed with the social services due to his late presentation; the case was closed later on as there were no child protection or serious child welfare concerns.

## **Discussion**

As depicted in our patient during his acute deterioration, the bowel dilation secondary to the faecal loading resulted in an increasing intra-abdominal pressure and compression of intra-abdominal vasculature.<sup>1 2</sup>

Compression of the venous system leads to venous occlusion and a reduction in cardiac preload, while arterial compression leads to reduced arterial compliance and an increased afterload. The combined effects subsequently lead to a reduced cardiac output. The cardiac output may further be compromised by an increase in intra-thoracic pressure due to diaphragmatic splinting and elevation. This occurs through direct compression of the heart leading to reduction of the right and left ventricle end-diastolic volumes.<sup>2</sup>

Consequently, our patient presented as a case of shock, with pallor, tachycardia and respiratory distress. The child was initially appropriately treated as such with aggressive fluid resuscitation and oxygen supplementation.

The respiratory distress occurred secondary to the displacement of the hemi-diaphragms cephalad<sup>3</sup>, limiting alveolar gas filling and leading to a ventilation-perfusion mismatch. Radiologically, the colonic dilatation was appreciated, and the respiratory sequelae was recognized by his markedly elevated hemi-diaphragms<sup>4</sup> and inadequate lung expansion.

Despite extensive testing, a diagnosis of functional constipation still holds. Hirschsprung's disease was out ruled due to the age of presentation.<sup>5</sup> Furthermore, with close monitoring, the treating team was successful in reinstating a healthy bowel regimen following his discharge. This rare case supports that aggressive treatment of constipation is imperative as neglecting long standing constipation can have serious implications.<sup>6</sup>

### **Declaration of Conflicts of Interest:**

The authors have no conflicts of interest to disclose.

### **Corresponding Author:**

Salma Mohamed  
Paediatric Department,  
St. Luke's General Hospital,  
Kilkenny,  
Ireland.  
E-mail: salma.eldaw@gmail.com

### **References:**

1. Serrano Falcón B, Barceló López M, Mateos Muñoz B, Álvarez Sánchez A, Rey E. Fecal impaction: a systematic review of its medical complications. *BMC Geriatr.* 2016; 16(4).

2. Malbrain M, De Waele J, De Keulenaer B. What every ICU clinician needs to know about the cardiovascular effects caused by abdominal hypertension. *Anaesthesiology Intensive Therapy*. 2015; 47(4): 388-99.
3. Milanese A, Schechter NL, Ganeshanathan M. Constipation presenting as respiratory distress. *J Adolesc Health Care*. 1986; 7(4): 255-8.
4. Flageole H, Ouahed J, Walton J, Yousef Y. Abdominal Compartment Syndrome Secondary to Chronic Constipation. *Case Rep Pediatr*. 2011.
5. Ghosh A, Griffiths D. Rectal biopsy in the investigation of constipation. *Archives of Disease in Childhood*. 1998; 79: 266-268.
6. Wrenn K. Fecal impaction. *N Engl J Med*. 1989; 321(10): 658-662.