



## Neonatal Aerophagia Dilemma – A Gastrointestinal Functional Disorder: Role of Imaging Studies

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### Authors' contributions

*This work is carried out in collaboration between all authors. Author BBS designed the study, wrote the protocol, and wrote the first draft of the manuscript. Author Shashi Sharma managed the literature searches. Author Sandeep Sharma managed the experimental process. Author PR helped in the design of the study and author Shweta Sharma helped in literature searches and final design. All authors read and approved the final manuscript.*

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Case Study

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### ABSTRACT

Aerophagia is excessive swallowing of air which goes to stomach through oesophagus and causes abdominal distention. This may alert the parents of pediatric age group especially neonates and causes anxiety. Although it's a functional condition, the clinical presentation can suggest malabsorption or obstruction, leading to unnecessary tests and investigations. We present a 15 days -old neonate who was brought to the pediatric surgical emergency with one such condition

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and was managed conservatively after imaging studies ruled out any underlying pathology. The case was discharged without any surgical intervention.

**Keywords:** Aerophagia; neonate; imaging studies.

## 1. INTRODUCTION

Aerophagia or Aerophagy is passing of excessive air to the stomach which in turn leads to manageable transient abdominal signs and symptoms. Infants have more air in their stomachs and large bowels comparing to adult, without symptoms. If they have aerophagia, symptoms as bloating, belching, flatulence, distension, constipation and abdominal pain may appear. We will describe below a 15 day old with similar type of ailment.

## 2. CASE REPORT

15 days-old infant was admitted in pediatric emergency with four days history of distended abdomen and excessive crying. There was history of non bilious projectile intermittent vomiting. There was no abnormal pre or perinatal obstetric history. There was no record of Apgar score, birth weight and length because of lack of medical assistance on rural zone where family lives. The child was of normal weight and height at birth as parents' statement. The infant was evaluated by surgical team with the view of impending surgical intervention. On examination, the infant weighted 2.5 kg, was lethargic and had distention of the abdomen with olive shaped mass when feeling the upper abdomen. The bowel sounds were increased. Rectal examination was unremarkable. Nasogastric tube was placed. The aspiration was clear yellowish fluid. After hydration the child recovered normal neurological status. The routine laboratory investigations including electrolytes were within normal limits for age. The diagnosis hypothesis was hypertrophic pyloric stenosis (HPS). Informed consent was taken from the parents for carrying out all the investigations and management. Plain abdomen X-ray has shown the distended abdominal gut loops without evidence of obstruction (Fig. 1). Abdominal ultrasound (USG) examination has ruled out hypertrophy of the pylorus and other related abnormalities. Gastrografin swallow upper gastrointestinal series was done to rule out any abnormality. The study revealed the normal opacification of gut loops without any gross distention or obstruction (Figs. 2a, b and c). The infant was placed under observation with

intravenous line for maintaining the fluids and nutrients. The child was discharged after 48 hour observation without the previous signs and symptoms of the pseudo-obstruction.



**Fig. 1. Plain abdominal X-ray AP view. The stomach and small bowel loops are distended with air (black hollow arrow). No evidence of any fluid level suggestive of obstruction. The air shadows are seen right up to distal large bowel (black star)**

## 3. DISCUSSION

The presence of gas in the gastrointestinal system has two origins: the air swallowed and the breakdown products of the undigested food. Aerophagia is commonly seen in infants and children because of excessive crying or not feeding the child with proper diet. The excess of the air is swallowed when cricopharyngeal sphincter does not regulate breathing and feeding mechanisms [1]. The passing of the gas through GI tract is a natural process but can cause discomfort if excessive. Pathological aerophagia occurs when air swallowed results in abdominal distension and other symptoms as bloating, belching, flatulence, constipation and abdominal pain. In severe cases it can lead to pneumoperitoneum, volvulus of colon and intestinal perforation. Sometimes the gas is automatically absorbed with either passage of time or by flatulence which is more commonly seen in infants and toddlers [2,3].



**Fig. 2. Gastrografin swallow upper GI series. (a) AP view shows opacified early small bowel loops without obstruction (black hollow arrows). (b) Left lateral view of abdomen shows opacified small bowel loops (black hollow arrow) and the gas shadow could be seen till distal end of the large bowel (white hollow arrow). (c) Right lateral view of abdomen shows normal duodeno-jejunal flexure (large black hollow arrow) and the gas shadow clearly seen at the distal end of the large bowel (small hollow black arrow)**

The characteristic picture of aerophagia is abdominal distention that progressively increases during the day (minimum in the early morning and maximum in the late evening), increased flatus during sleep, increased bowel sounds on auscultation of distended abdomen. In addition the abdominal radiograph done in the late afternoon shows an air distended stomach and decreased gas in the small and large bowel without signs of obstruction [4]. The diagnostic criteria is based on Rome III criteria for functional diseases in children where G3, G4, H1 and H2 criteria play crucial role in clinching the diagnosis [5]. 8.8% of the children have also got additional mental retardation. Aerophagia can be present in normal children with anxiety after psychological stressful event. It is mandatory to make differential diagnosis with other functional motility disorders as gastroparesis, megacolon and intestinal pseudo obstruction, and pathological diseases such as malabsorption and obstruction of GI tract. Routine screening USG examination is done to rule out hypertrophic pyloric stenosis or any other pathology. Plain abdominal x-ray in the morning and in late afternoon with increasing gas in GI tract in the last one. These x-rays were not carried out in our case as the reporting was in emergency. Gastrografin contrast swallow upper series is done after explaining the total procedure and its results [6]. After diagnosis of functional aerophagia, the treatment should be "parents" reassurance of functional condition. The other additional managements include neuropsychiatric consultation for stressful events, speech therapy for making conscious of inadequacy of the air swallowing behavior, diet

free of beverages containing gas and prescribe simethicone or dimethicone to reduce gas formation. The correct diagnosis for these patients can avoid unnecessary investigations and surgical interventions and alleviate parents' concern. In our case, being in neonatal period, the follow up should be carried out with the consultation with pediatrician and the treatment should include dimethicone or simethicone as needed.

#### 4. CONCLUSION

Patients with functional aerophagia should be treated with multidisciplinary approach so that unnecessary investigations and surgical interventions can be avoided. Parents' education relieves their concerns and improve acceptance of such condition.

#### ETHICAL APPROVAL

It is not applicable.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

#### REFERENCES

1. Hwang JB, Choi WJ, Kim JS, Lee SY, Jung CH, Lee YH, Kam S. Clinical features of pathologic childhood aerophagia: early recognition and early diagnostic criteria. *J Pediatr Gastroenterol Nutr.* 2005;41:612-615.

2. Bredenoord AJ, Weusten BL, Timmer R, Smout AJ. Psychological factors affect the frequency of belching in patients with aerophagia. *Am J Gastroenterol*. 2006;101: 2777-2781.
3. Loening-Baucke V. Aerophagia as causes of gaseous abdominal distention in a toddler. *J Pediatr Gastroenterol Nutr*. 2000; 31(2):204-207.
4. Bredenoord AJ. Management of belching, hiccups, and aerophagia. *Clin Gastroenterol Hepatol*. 2013;11:6-12.
5. Helgeland H, Flagstad G, Grotta J, Vandvik PO, Kristensen H, Markestad T. Diagnosing pediatric functional abdominal pain in children (4-15 years old) according to the Rome III Criteria: Results from a Norwegian prospective study. *J Pediatr Gastroenterol Nutr*. 2009;49:309-315.
6. De Giorgio R, Cogliandro RF, Barbara G, Corinaldesi R, Stanghellini V. Chronic intestinal pseudo-obstruction: Clinical features, diagnosis, and therapy. *Gastroenterol Clin North Am*. 2011;40(4): 787-807.

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