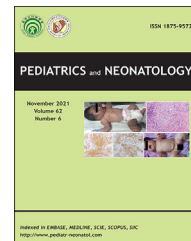


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Letter to the Editor

## Watch your numbers! Avoiding gastric perforation from feeding tubes in neonates



A premature 34-week-old newborn weighing 1.8 kg was admitted to the Neonatal Unit following delivery for maternal preeclampsia. She was edematous at birth, and though her weight was on the 16.9th centile by the Fenton chart, her length was only 39 cm (2.1st centile). The newborn had mild respiratory distress syndrome and was placed on nasal continuous positive airway pressure for <24 h and subsequently on room air. Her risk for necrotizing enterocolitis was deemed low in the absence of additional risk factors.

An 8 French orogastric tube (OGT) was inserted 18 cm deep on admission for enteral feeding. The chest radiograph revealed the OGT tip to be abutting the stomach wall along the greater curvature but its position was not adjusted (Fig. 1a). Her milk feedings were tolerated well.

At 72 h of life, she developed acute abdominal distension with significant pneumoperitoneum on abdominal X-rays (Fig. 1b). Laparotomy revealed a 0.3-cm perforation over the greater curvature of the stomach (Fig. 1c). The perforation's edges were healthy and uniform and repaired primarily. The rest of the intestines were healthy. Postoperatively, the newborn recovered well and intraoperative cultures returned negative. As the size and location of the perforation approximated that of a feeding tube, iatrogenic perforation was suspected. Retrospectively, based on the newborn's birth weight and length, a smaller sized 6 French OGT was thought to be more appropriate. Similarly, the depth of insertion using surface measurements via the nose–ear–mid-umbilicus (NEMU) method for OGT insertion—the distance from the corner of the mouth to the right ear lobe (or tragus as per hospital guidelines) to the midpoint

of the umbilicus—was only 16 cm. Open disclosure was conducted with the newborn's parents.

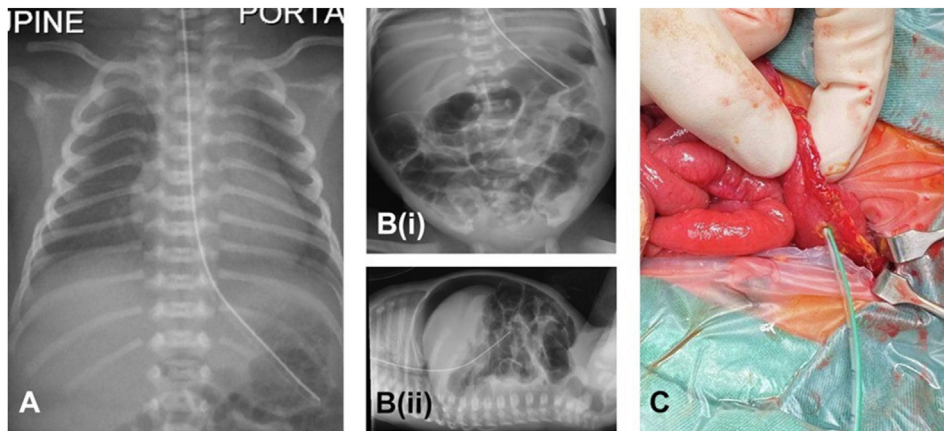
Gastric perforation accounts for 7% of neonatal gastrointestinal perforations<sup>1</sup> associated with bag-mask ventilation and OGT insertion.<sup>2</sup> More prominent gaps in the musculature layer at the greater curvature of the stomach in the premature infant are hypothesized to be areas of relative weakness. An OGT tip abutting this area, hence, may contribute to iatrogenic perforation and can be defined intraoperatively as puncture wounds or short lacerations. Acute abdominal distension is the most common clinical presentation of gastric perforation, mimicking symptoms of necrotizing enterocolitis. Early diagnosis and appropriate management of neonatal gastric perforation result in good clinical outcomes.

Using an appropriately sized OGT and accurate measurement of insertion depth according to standard guidelines is important, which include the NEMU or age-related, height-based method.<sup>3</sup> Weight-appropriate guidelines are present for OGT insertion depth; however, we recommend caution in a child whose weight is not proportionate to the length. The correct location of an OGT should be angled toward but not bending along or touching the greater curvature of the stomach, with the tube tip or side orifice in the body of the stomach.

Confirmatory imaging of an OGT is not routine; however, any radiologically diagnosed malpositioned feeding tube must be immediately repositioned to avoid risk of adverse events. The procedure of feeding tube insertion, although commonplace in practice, must be done vigilantly.

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**Figure 1** (A) Day 1 chest X-ray with malpositioned orogastric tube (OGT) abutting the greater curvature of the stomach. (B) (i) X-ray demonstrating pneumoperitoneum, again with malpositioned OGT and (ii) X-ray demonstrating pneumoperitoneum on the lateral decubitus view. (C) Surgeon demonstrating site of gastric perforation using an OGT.

### Author contribution

Dr Ng and Dr Sinnathamby conceptualized, gathered information and drafted the manuscript. All authors critically reviewed the manuscript for important intellectual content, revised and approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

### Patient consent

The parent of the child whose data is presented in the manuscript has given consent to use investigation results and images for the purpose of Research.

### Declaration of competing interest

None.

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