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Iatrogenic esophageal perforation in a premature neonate: A current nonoperative approach to management☆

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ABSTRACT

Esophageal perforation in the neonate is uncommon but requires a prompt diagnosis in order to prevent further complications. We describe a case of a premature neonate presenting with bloody oropharynx aspirate after orogastic tube placement. Findings on plain film radiograph were consistent with esophageal perforation. Due to the patient's hemodynamic stability, the patient was treated non-operatively with favorable results. The current management of esophageal perforation in the neonate is a non-operative approach.

Esophageal perforation is a rare but potentially fatal event with mortality rates estimated to be as high as 28% [1]. Premature neonates are more vulnerable to esophageal perforation than full-term neonates [1]. According to the literature, gastric tube insertion, esophagoscopy and attempted endotracheal tube intubation accounts for 71%–84% of perforations [2]. Symptoms depend on the site of perforation and may include respiratory distress, tachycardia, tachypnea, drooling and coughing [1]. We present a case of iatrogenic esophageal perforation in a premature neonate following orogastric (OG) tube placement.

1. Case report

A premature female neonate was delivered at 26 weeks gestation to a 33-year-old gravida 6, para 3, weighing 0.92 kg at time of delivery. Apgar scores were 3, 6, and 7 at 1, 5, and 10 min, respectively. The patient was without spontaneous respirations, promptly intubated and subsequently managed in the neonatal intensive care unit.

On day of life (DOL) 4 the patient self-extubated, was subsequently re-intubated and an OG tube was inserted. Bloody aspirate was found in the OG tube and the oropharynx. Previous OG tube placements had been uneventful. A plain radiograph was obtained demonstrating a widened distal loop of the OG tube exceeding the esophageal width (Fig. 1). The diagnosis of esophageal perforation was based on clinical presentation and findings on plain radiograph. The OG tube was removed.

On examination, the patient appeared to be alert and hemodynamically stable. An abdominal radiograph revealed the presence of air in the small bowel and colon. An echocardiogram was obtained without evidence of cardiac anomalies.

Given the patient's hemodynamic stability, the patient was treated non-operatively. Management included nil per os, avoidance of OG tube insertion, minimal oropharynx suctioning, antibiotics and total parenteral nutrition. On DOL12, a thin-barium esophagography was performed which showed passage of contrast from the esophagus to the stomach without extravasation (Fig. 2). At this time, a feeding tube was inserted and enteral feeding initiated. Chest radiography confirmed proper positioning of the tube (Fig. 3). On DOL33 the patient tolerated per os feeding and was discharged on DOL63. On subsequent follow-up, the patient is tolerating bottle feeding.

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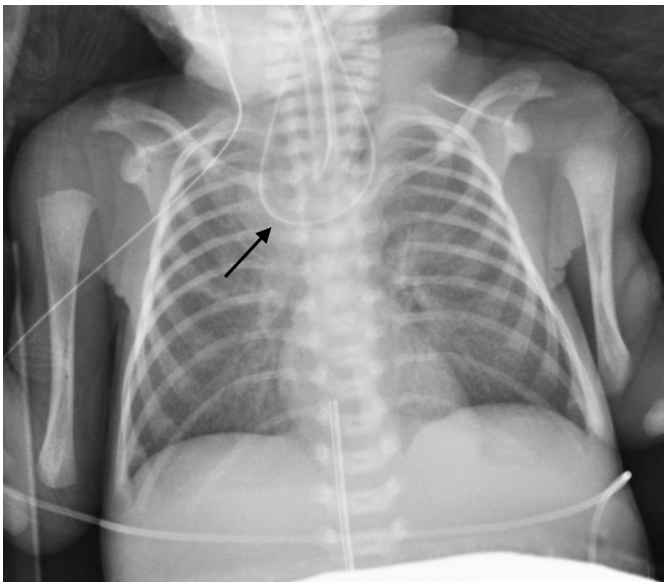

Fig. 1. Chest radiograph with coiling of OG tube.

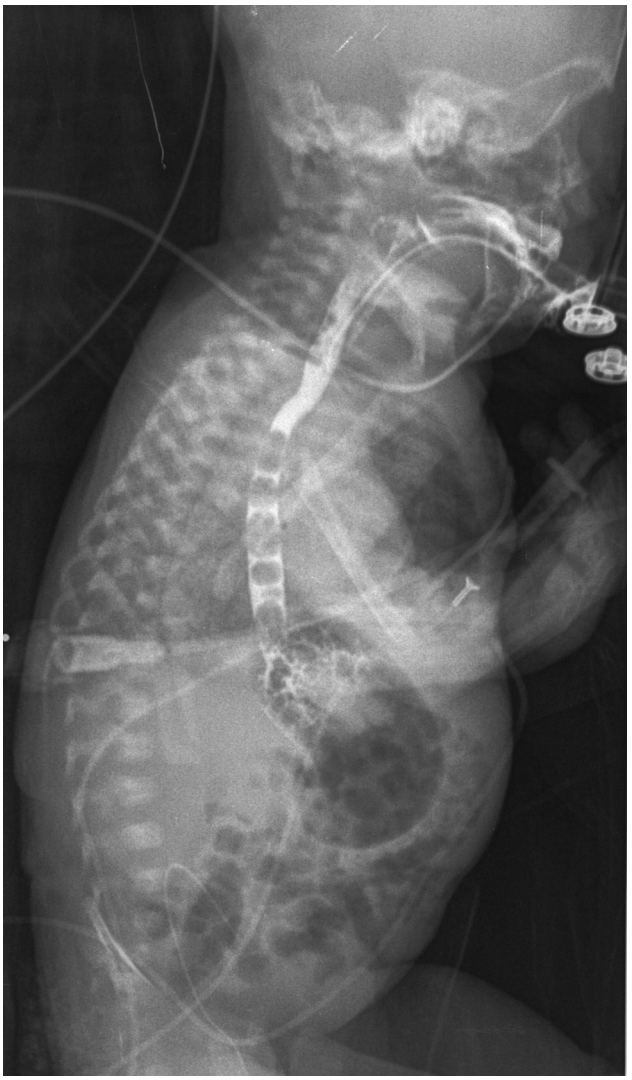

Fig. 2. Thin barium esophagography without extravasation of contrast.

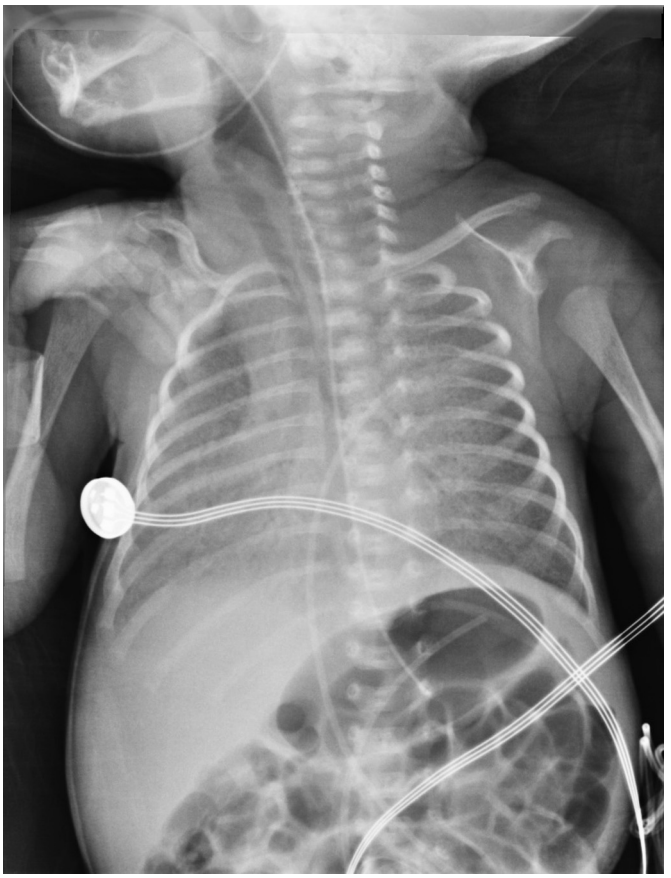

Fig. 3. Plain radiograph with proper placement of OG tube.

2. Discussion

Esophageal perforation in the neonate is unusual but associated with mortality rates as high as 28% [1]. Prompt diagnosis is essential to prevent further complications such as mediastinitis, empyema, sepsis, and multi-organ failure [2]. Neonatal esophageal perforation is typically iatrogenic and often due to multiple intubation attempts, oropharyngeal suctioning, nasogastric or OG tube insertion [1]. In neonates, the pharyngoesophageal junction is the most frequent site of perforation likely due to anatomical narrowing as well as constriction due to instrumentation [1].

In the first 24 h after perforation, neonates tend to present with fever, hypersalivation, choking, coughing, or cyanosis after feeding [1]. Symptoms of esophageal perforation depend on its location. Patients with thoracic perforations may present with subcutaneous emphysema and signs of respiratory distress including tachycardia, tachypnea and grunting [1]. Patients with intra-abdominal esophageal perforations often present with signs of peritonitis, dysphagia, and drooling [1]. Esophageal perforation should be considered in the presence of bloody aspirate following difficult intubation or OG tube insertion [1]. Radiographic findings may include pneumothorax, pleural effusion, subcutaneous emphysema, pneumopericardium, pneumomediastinum, as well as abnormal OG tube location [1].

It is important to consider esophageal atresia in this clinical setting. Further studies should investigate the presence of congenital malformations including cardiac, renal and pulmonary anomalies [3].

Historically, the surgical treatment of esophageal perforation in neonates was based on adult population groups [2]. A surgical approach to neonate esophageal perforation is well described in the

literature [1,4]. Since the underlying causes of perforation and the neonates healing ability differs from the adult population, a different management approach is warranted [2]. The treatment of esophageal perforation in neonates has moved toward non-operative management with surgery only indicated for patients whose condition deteriorates [1,2,5]. Management includes nil per os, adequate fluid resuscitation, parenteral nutrition, and respiratory support [5]. Additionally, appropriate broad-spectrum antibiotic therapy is indicated [5].

3. Conclusion

We present a case of esophageal perforation in a premature neonate following OG tube insertion treated non-operatively. Although limited to a series of case reports, the literature suggests a non-operative approach in hemodynamically stable patients who respond favorably [2]. This approach is preferential due to the high morbidity and mortality associated with surgical interventions [6].

Conflict of interest

We wish to confirm that there are no known conflicts of interest associated with this publication and there has been no financial support for this work that could have influenced its outcome.

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