CASE REPORT

Near-Fatal Pleural Milk Collection Secondary to Orogastric Tube Induced Oesophageal Perforation in An Extremely Premature Infant

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ABSTRACT

We present a case of oesophageal perforation in an extremely premature neonate following orogastric tube insertion. This rare condition may cause significant morbidity and mortality if detected late. The suspicion of oesophageal perforation was raised after reviewing a chest radiograph and was confirmed by an upper gastrointestinal contrast study. The perforation healed spontaneously following conservative management consisting of nil by mouth, total parenteral nutrition, antibiotics and infusion of octreotide. Subsequently he was able to resume oral feeding without evidence of swallowing incoordination and discharged home at 3 months old. In an infant presented with worsening respiratory distress, the diagnosis should not be limited to only respiratory or cardiovascular pathology.
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INTRODUCTION

Neonatal oesophageal perforation following orogastric tube placement is a rare complication however it can be a devastating condition with high morbidity and mortality if recognized late. The incidence is about 1 in 124 in very low birth weight neonates and increased to 1 in 25 with those born below 750 grams (1). It may be asymptomatic and only detected if the chest radiograph shows malposition tip of the tube. In some infants, symptoms such as respiratory distress, vomiting or sepsis may develop. The management of neonatal oesophageal perforation is not well defined, however conservative management is more commonly employed than surgical management (1).

CASE REPORT

A male premature infant was born at 28 weeks with the birth weight of 840 grams via emergency lower segment Caesarean section for foetal intrauterine growth restriction with absent end diastolic flow. His mother had gestational hypertension and gestational diabetes mellitus. Antenatal dexamethasone was completed. He was born non – vigorous with poor breathing effort and required endotracheal intubation.

He was treated for severe respiratory distress syndrome and given endotracheal surfactant. Another complication of prematurity that he had was hemodynamically significant patent ductus arteriosus (PDA) which was successfully closed with paracetamol. Routine orogastric tube size 6Fr was inserted and expressed breast milk was started from day 2 and gradually increased. At Day 6 of life, he developed worsening respiratory distress with tachycardia and hypotension. Chest radiograph showed right lung consolidation and pleural effusion with orogastric tube deviated to the right side (Figure 1). This raised the suspicion of perforated oesophagus with right pleural effusion. His resuscitation required 20ml per kg 0.9% saline bolus and two inotropes which were dopamine and noradrenaline. Intravenous meropenem and metronidazole were also started for clinical sepsis.

To confirm the diagnosis, we performed upper gastro-

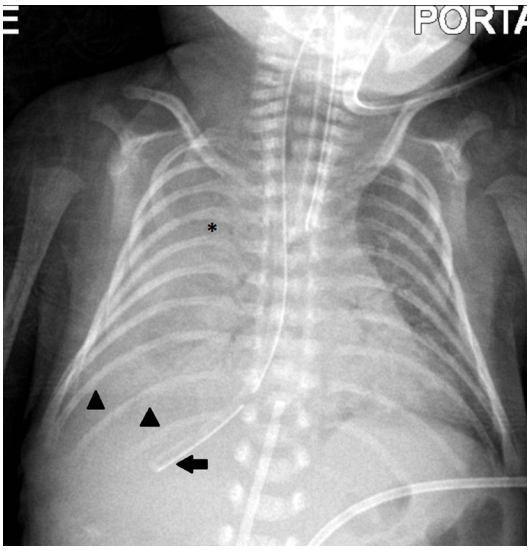

Figure 1: Chest radiograph shows right pleural effusion (arrowheads) and consolidative (*) changes. The orogastric tube tip (arrow) is seen at the right hypochondriac region.

intestinal tract contrast study which showed leakage of contrast into right pleural space at T6 to T8 suggestive of oesophageal perforation (Figure 2). His subsequent chest X-ray post contrast study showed right pleural collection due to leakage of contrast and fluids into the pleural cavity (Figure 3). A right chest tube size 6Fr was inserted for pleural drainage. Twenty mL of milk-like fluid was drained within 2 weeks. The drainage was removed after that to minimize risk of infection.

An infusion of octreotide at 1mcg/kg/hour was started to promote the healing of oesophageal injury. The duration of octreotide infusion was one month until the oesophagus clinically healed. He was kept nil by mouth for a total of six weeks with total parenteral nutrition support to allow complete healing process as this patient was extremely low birth weight and critically ill at the moment of diagnosis. Surgical repair was not done. Repeated upper gastrointestinal contrast study showed

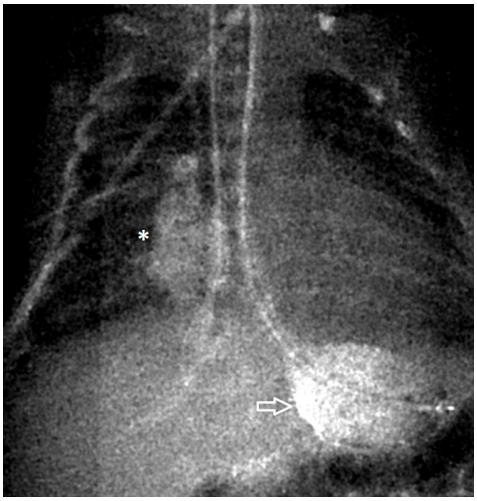

Figure 2: Contrast accumulation at the right pleural space (*) seen from previous orogastric tube due to oesophageal perforation. Also seen is the normal stomach contrast opacification at the left hypochondriac (open arrow) from new orogastric tube.

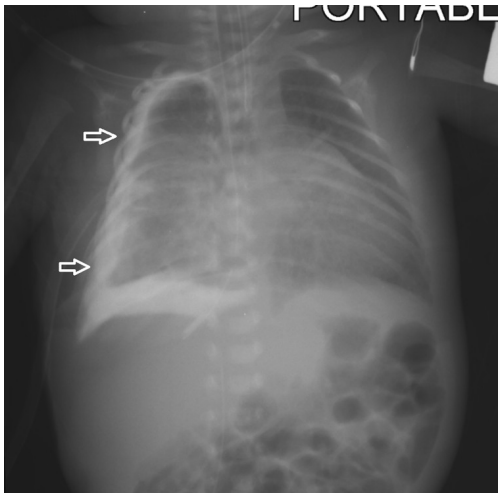

Figure 3: Accumulation of contrast within the right pleural cavity

no leakage from oesophagus (Figure 4). Enteral feeding was reintroduced and well tolerated. His clinical condition remained well and he was discharged home at three months old with no major clinical sequalae. His neurodevelopment has been appropriate to his age during follow up at our centre.

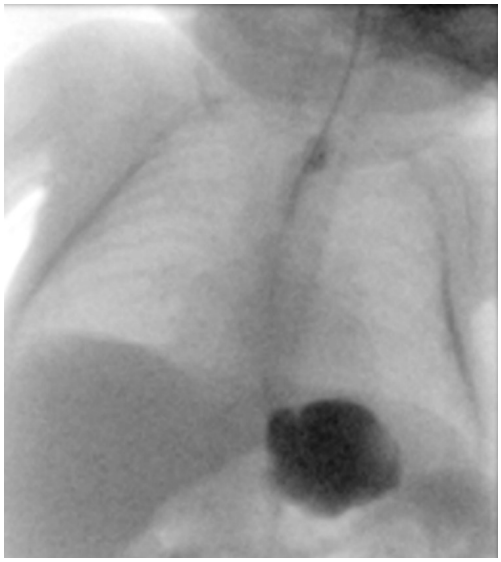

Figure 4: Previous right pleural contrast accumulation was not demonstrable in repeat fluoroscopy study

DISCUSSION

Oesophageal perforation in premature infant is rare with limited literature available. It can be due to iatrogenic and typically occurs under several circumstances: multiple attempts at intubation, insertion of an orogastric tube and suction of the pharynx (1). The mechanism of iatrogenic oesophageal perforation secondary to orogastric tube insertion was described by Sorensen et al (1). We currently use orogastric tube made from polyvinyl chloride (PVC) in our centre. It is not tissue compatible and becomes brittle compared to polyurethane (PUR) and silicone. PUR and silicone are tissue compatible. However, silicon is too flexible making its use impracti-

cal. Another problem is the immature oesophagus wall in premature infants offers minimal resistance leading to unnoticed perforations.

Despite the importance of confirming orogastric tube placement, routine chest radiograph for every insertion of orogastric tube not always practiced in many settings due to the risk of multiple radiation exposure. Symptoms such as bleeding from orogastric tube, blood stained oronasal suction, haemodynamic deterioration, vomiting and respiratory distress may present following perforation. However, in rare cases, the perforations may be asymptomatic and only noticed when chest radiograph is performed for other reasons or when feeding is introduced to the baby. Clinicians must remain vigilant that symptoms can be nonspecific and overlap with other conditions. In this patient, he presented with signs of mediastinitis such as respiratory distress and shock-like symptoms.

When reviewing such chest radiographs, other differential diagnosis to be excluded are malrotation, congenital diaphragmatic hernia and oesophageal atresia (2). Upper gastrointestinal tract contrast study can help to exclude malrotation. In congenital diaphragmatic hernia, the contrast will be visualized in the stomach with herniation into the thoracic cavity. Flexible endoscopy can be used to visualize the perforation site however its usage depends on the weight of the patient and the size we had was not suitable for premature babies. Hence in our case, oesophagogram is the method of choice to confirm the perforation site by observing the site of leakage.

In a case series by Eguchi et al, six patients were treated conservatively with antibiotics, kept nil by mouth and only two patients required thoracocentesis with good outcome (3). The management of oesophageal perforation in neonate is mainly conservative including removing the orogastric tube, keep nil by mouth, administration of antibiotics and total parenteral nutrition (1). The injury is allowed to heal spontaneously in 10 to 14 days. Oesophagogram can be repeated to confirm the patency of oesophagus before reinserting orogastric tube and commencement of enteral feeding (2).

In our patient, we started octreotide infusion. Octreotide has been reported to reduce the length of hospital stay among children although there is limited evidence in neonatal population (1). Octreotide is a somatostatin analogue which decrease gastrin, vasoactive intestinal polypeptide, motilin, neurotensin, acetylcholine, secretin, cholecystokinin, and gastric inhibitory peptide release (4). By reducing secretions and early drainage of fluid, perforations tend to close more rapidly. However, further studies are needed to establish its clinical usefulness.

CONCLUSION

Neonatal oesophageal perforation is usually traumatic secondary to orogastric tube insertion. Careful interpretation of chest radiograph is essential to avoid missing this important diagnosis. Confirmatory investigations such as oesophagogram are crucial and other imaging like abdominal ultrasound may be necessary to exclude other potential differential diagnosis. The mainstay of treatment includes antibiotics, keeping baby nil by mouth, pleural drainage and total parenteral nutrition. Before initiating enteral feeding, it is important to repeat oesophagogram to ensure patency of oesophagus.

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