

Perforation of the upper and lower segments of atretic esophagus (type C) secondary to nasogastric tube insertion

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Abstract We report an unusual case of nasogastric tube, during insertion, perforating the upper and lower segments of atretic esophagus (type C) and ending up in the stomach. Symptoms and imaging of the newborn are presented and the causative factors of the incident discussed.

Keywords Neonatal surgery · Esophageal atresia · Nasogastric tube · Esophageal perforation

Background

In a newborn, esophageal perforation during a nasogastric tube insertion occurs, probably more frequently than reported in the literature [1–3]. The iatrogenic perforation may lead to serious complications and sometimes also to a misdiagnosis of underlying esophageal atresia [4, 5]. However, most esophagi were found normal. We present a case of a true esophageal atresia with a distal tracheoesophageal fistula, where an inserted nasogastric tube perforated both segments and ended up in the stomach.

Case

A full-term boy of 3,640 g was born after normal pregnancy; no polyhydramnios or abnormalities had been detected in prenatal ultrasonography. A couple of hours after his birth, the patient presented symptoms of excessive salivation, regurgitation at all feedings, and respiratory

distress. A small ventricular septum defect and syndactyly on left foot were also diagnosed. On the first day of his life, there were difficulties in inserting a nasogastric tube of polyvinyl chloride (PVC), but on the second attempt the tube was finally introduced into the stomach, which was confirmed with a plain X-ray (Fig. 1). The size of the tube was Ch 8, no guide wire was used. Because of continuing salivation in a newborn with minor anomalies, a contrast esophagography was performed without delay at age of 21 h. The imaging showed a narrowing of the esophageal lumen at the distal third. There was no leakage of the contrast medium, but the medium was well seen in the lower segment and in the stomach (Fig. 2). At age of 1 day the suggested diagnosis of esophageal stenosis led to an esophagoscopy which revealed a perforation in the tip of the atretic upper segment. A conventional thoracotomy, transpleural closure of the lower fistula and esophagoesophagostomy of somewhat overlapping upper and lower segments were performed. The recovery was uneventful. The preoperative laboratory values for infection were normal, and no signs of mediastinitis or pneumothorax were seen.

Discussion and conclusion

True perforations of the upper esophageal segments are not common and they are reported less often than perforations of the neonatal hypopharynx [1, 3, 4]. Our neonatal unit has been using PVC nasogastric tubes for years because these tubes are easier to insert than soft tubes made of silicon, which may coil in a normal esophagus and give a false diagnosis. These PVC tubes have not perforated the esophagus before, but some perforations of the hypopharynx have been reported at our unit. Apparently, successful

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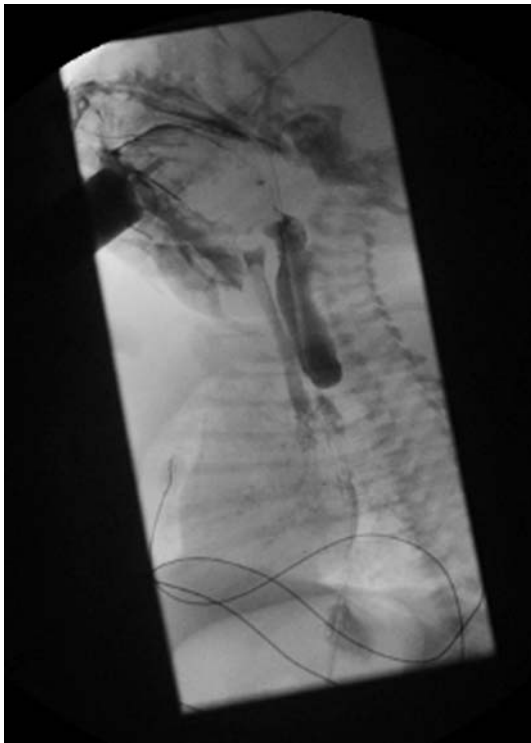


Fig. 1 A plain X-ray shows that a nasogastric tube is inserted through the esophagus into the stomach

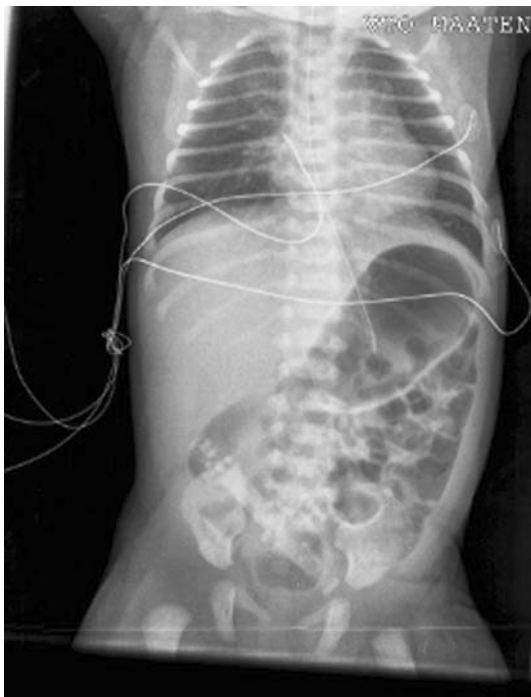


Fig. 2 Both the upper and lower esophageal pouches are outlined by a contrast medium. A nasogastric tube is seen inside the esophagus ending up in the stomach. Some of the contrast medium has entered the trachea by aspiration, but none leaked into the mediastinum

insertion of the nasogastric tube should usually exclude the possibility of esophageal atresia. Continuation of salivation in this baby with anomalies, however, strongly suggested abnormality in the esophagus. Further examinations and finally the operation revealed the real diagnosis. There are other causative factors which possibly led to the perforation of both segments of the atretic esophagus: segments were in close intimacy to each other without a gap and the upper pouch was not much dilated. Close proximity of the segments is a common finding. According to Foker et al. [6], more than third of cases with esophageal atresia had a short, less than 1-cm-wide gap. The position of the pouches in the present case resembled that of esophageal stenosis, although in this case there was no lumen seen.

A rare case of iatrogenic perforation of atretic esophageal upper and lower segment without complications was presented. Delayed diagnosis could have led to a mild infection. Gastro-intestinal symptoms in a newborn with minor anomalies should lead to suspicion of undiagnosed anomalies.

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