

# Membranous diaphragm presenting as esophageal atresia in a neonate

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## ABSTRACT

Whenever a newborn infant presents with excessive salivation and failure to pass nasogastric tube, one of the 5 major types of esophageal atresia is suspected. We report a rare case where a newborn infant presented with features of esophageal atresia due to membranous diaphragm.

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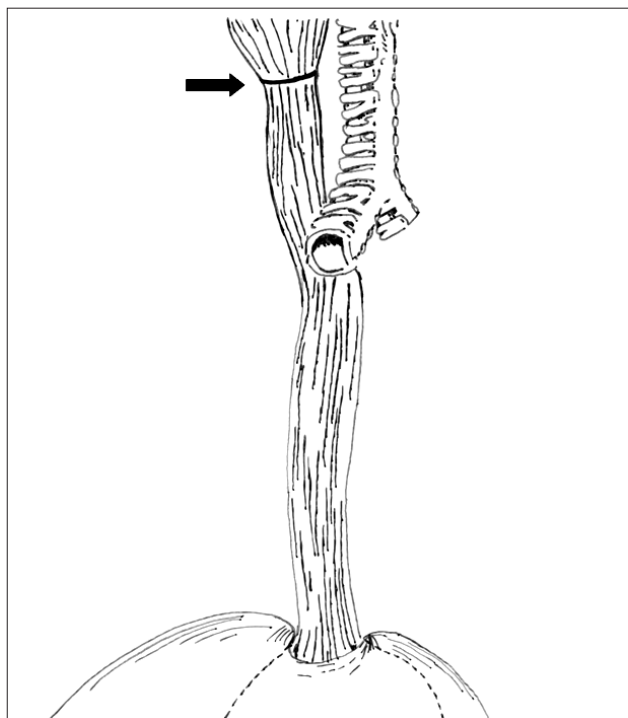
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Esophageal atresia (EA) is a common congenital anomaly. Although many types have been described, proximal atresia and distal trachea-esophageal fistula are the most common. We report a case, where a newborn was presented with features of EA due to membranous diaphragm (MD) (**Figure 1**). This appears to be a new subtype of type IV membranous atresia (MA), as described by Kluth.<sup>1</sup>

**Case Report.** A full term male infant with a birth weight of 3.5 kg was referred shortly after birth with choking after feeding and excessive salivation requiring frequent oral suction. An attempt to pass a nasogastric tube (NGT) into the stomach failed. The x-ray image showed the NGT had slipped into the right bronchus. The stomach was distended with air. A diagnosis of EA with tracheo-esophageal fistula was made and he was prepared for surgery. When the anesthetist tried to introduce the NGT into the upper pouch with the help of indirect laryngoscope, it was found that the upper

pouch of esophagus was very shallow. This could explain why the tube slips into the bronchus. At thoracotomy through the right 4th intercostal space, the esophagus appeared intact. On tracing the esophagus up to the thoracic inlet, it was noticed that the NGT was obstructed. There was dilation of the proximal esophagus with narrowing at the junction (site of MD) and a normal caliber distal esophagus. No tracheo-esophageal fistula was seen. Transection of the esophagus below the level of suspected obstruction revealed MD, which was obstructing the NGT. The membrane was excised and the NGT passed easily into the stomach, and an end to end anastomosis was performed. Postoperatively, he was extubated after 2 days and had an uneventful recovery. A contrast study one week post-thoracotomy showed esophageal patency with no leakage. The followed up for almost 2 years, since the operation and has been gaining weight and growing. However, he has gastro-esophageal reflux and is now undergoing treatment.

**Discussion.** Whenever a newborn infant presents with frothing and excessive salivation at birth, a diagnosis of EA is made, and this is further confirmed by inability to pass an NGT into the stomach. In most centers, an operation is scheduled based on the above findings, and the presence of air in the stomach. No further contrast studies are usually performed. The presence of MD has been described previously by Abel.<sup>2</sup> Nihoul-Fekete et al<sup>3</sup> referred to it as one of the 3 varieties of congenital esophageal stenosis; presence of tracheobronchial remnants and fibromuscular stenosis being the other 2. However, most descriptions of congenital stenosis have been in infants usually around 6 months of age, at the time of introduction of solid foods. The pathology involves the middle or lower esophagus.<sup>4</sup> Kluth<sup>1</sup> described a variety of EA due to MD, and refers to it as MA. He has further classified this group as type IV EA, and mentions various subtypes. In our case, presentation was at birth with features of EA. This appears to fit into the type IV MA category. However, MD was at a higher level (**Figure 1**) than the various subtypes previously described. Thus, we feel



**Figure 1** - Membranous diaphragm (arrow-membranous diaphragm).

that our case is a different subtype of type IV MA. It is difficult to explain the presence of air in the stomach in the absence of tracheo-esophageal fistula. It can be speculated that this was possibly due to a small hole in the MD, which was not visible to the naked eye.

It could be argued that such a case should have been managed endoscopically. However, our initial diagnosis was EA, therefore we did not contemplate endoscopy. In summary, we presented a newborn infant who had symptoms of EA and was found to have MD, a new subtype of type IV MA.

## References

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## Case Reports

Case reports will only be considered for unusual topics that add something new to the literature. All Case Reports should include at least one figure. Written informed consent for publication must accompany any photograph in which the subject can be identified. Figures should be submitted with a 300 dpi resolution when submitting electronically or printed on high-contrast glossy paper when submitting print copies. The abstract should be unstructured, and the introductory section should always include the objective and reason why the author is presenting this particular case. References should be up to date, preferably not exceeding 15.