Case Report

Misdiagnosing esophageal perforation as esophageal atresia

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ABSTRACT

We report a case of traumatic perforation of esophagus misdiagnosed as esophageal atresia in a 1.7 kg preterm (28 weeks) twin. Initial resistance to the passage of orogastric tube and failure of passage of contrast material down the esophagus prompted the diagnosis of esophageal atresia. Subsequently, the passage of orogastric tube as well as radiological findings at the age of 7 days made us change the diagnosis to traumatic perforation of esophagus. The baby was managed conservatively and discharged in good health at the age of 2 months. Literature is reviewed and the attention of pediatricians is drawn to this problem.

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Injury to esophagus caused by suction catheter, nasogastric and endotracheal tubes and laryngoscope blade is generally unrecognized until the baby develops signs of esophageal obstruction or radiographic evidence of pharyngeal perforation.[1] The clinical and x-ray findings of esophageal perforation are often confusing. The incidence is low and therefore its unfamiliarity to the pediatrician often results in critical delay in diagnosis and therapy.[2] In this communication, we report our experience with one case reported below and review literature aiming to draw the attention of pediatricians to this important problem.

Case Report. A 28-week preterm twin one weighing 1.7 kg was intubated in the labor ward by a junior resident due to respiratory distress and transferred to the neonatal intensive care unit where he deteriorated and oxygen saturation dropped to a very low level. Examination revealed reduced air entry bilaterally and pneumothorax was clinically suspected and a bilateral chest tubes were inserted, and the baby improved. An x-ray showed residual bilateral pneumothorax and pneumomediastinum. The baby was started on ampicillin and gentamycin and an attempt to pass an orogastric tube to decompress the stomach was met with resistance. Repeated attempts produced similar results. An x-ray showed mild distension of the hypopharynx but no coiling of the oropharyngeal tube and the tip was seen at the level of T6 **(Figure 1)**. As the clinical and x-ray findings were not typical of esophageal atresia, a contrast study, using minimal amount of omnipaque was performed. As the contrast was seen tracking along the oropharyngeal tube **(Figure 1 & 2)**, diagnosis of perforation of proximal pouch of an esophageal atresia was made and the baby was managed conservatively with total parenteral nutrition, frequent suction of proximal pouch, antibiotics and ventilatory support. On day 3, the baby became lethargic and sepsis was suspected. After sending blood, urine and cerebrospinal fluid for culture, antibiotics were changed to imipenem and vancomycin. On the 7th day, he was seen for the first time by the Surgeon. He pass successfully an orogastric tube without any resistance. Repeat

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Figure 1 - Anteroposterior chest x-ray showing residual pneumomediastinum and feeding tube far to the right of the endotracheal tube.

Figure 3 - X-ray taken at the age of 7 days showing normal path of the orogastric feeding tube with contrast.

Figure 2 - X-ray of chest lateral view showing the abnormal course of the feeding tube and the contrast anterior to the endotracheal tube in the mid chest.

Table 1 - Reports of esophageal perforation mimicking esophageal atresia.

Author	n of cases reported	n of cases mimicking esophageal atresia	Comment
Krasna et al[4]	11	4	2 operated mistakenly as esophageal atresia
Mollitt et al[6]	9	5	5 presented with difficulty in passage of catheter or tube
Gorinati et al[7]	1	1	NPO + BSA + TPN
Bonnard et al[8]	12	5	5 Thoracotomy 1 Gastrostomy 6 BSA + TPN
Bader et al[9]	2	2	NPO + BSA + TPN
Zorzi et al[10]	2	1	Operated as suspected case of esophageal atresia and perforation of proximal pouch
Vandenplas et al[11]	1	1	Double esophagus on contrast study BSA + TPN + NPO
Total	**38**	**19**	

n - number, NPO - nothing by mouth, BSA - broad spectrum antibiotics, TPN - total parenteral nutrition

contrast study **(Figure 3)** showed no evidence of esophageal atresia. On retrospective review of x-rays, we realized that the initial abnormal position of the feeding tube was due to a false tract, rather than esophageal atresia. The baby was then initially started on orogastric tube feeding from day 7 and later orally without any complication and discharged in good health at the age of 2 months.

Discussion. Traumatic esophageal perforation mimicking esophageal atresia is rare and up to date approximately 19 cases had been reported and summarized in the literature **(Table 1)**. On the other hand, perforation of esophageal atresia is thought to be a more common occurrence in the neonate than it was described in the literature[3] and many cases of traumatic esophageal perforation can be misdiagnosed as esophageal atresia. This preterm baby was intubated hastily by an inexperienced resident in the delivery room. During the process it was possible that the esophagus was traumatized and a flap of mucosa was created which could have acted as a valve directing the orogastric tube along a false passage. It is well known that extension of the neck during intubation when esophagus is compressed against the cervical vertebra increases the risk of perforation.[4] Possible alternative mechanism is that trauma to the posterior pharynx could have caused spasm of cricopharyngeal muscle which form the introitus. This is the narrowest part of the esophagus which could have closed by reflex constriction during instrumentation.[2] Attempting to force the orogastric tube down the esophagus could have lead to perforation. Feeding tube due to faulty technique can cause perforation. Feeding tubes in our unit are usually inserted through the mouth. This method is more prone to cause trauma than the nasal route when the direction will be downward rather than posterior.[4] Krasna et al[4] has reported 11 cases of esophageal perforation and grouped their presentation into 4 types. Presenting as (i) esophageal atresia (4 cases) (ii) right pneumothorax and feeding tube in right chest (4 cases) (iii) right sided infiltrate and abnormal right extrapleural air collection (2 cases) and (iv) esophageal duplication (one case).

Esophageal perforation mimicking esophageal atresia is a well-recognized presentation. There are several reports of such presentation. Most present as inability to pass a feeding tube. Other presentations are frothing, and blood in the pharynx and inability to pass a feeding tube beyond mid chest. The presumed explanation is that pharyngeal injury causes circopharyngeal spasm leading to signs of proximal esophageal obstruction. Our case had pneumothorax and was wrongly thought to have esophageal atresia. This is because this was our first experience in the unit. Diagnosis may be made by carefully interpreting the plain x-ray, doing contrast study and by direct visualization. Grunebaum et al[5] had been described the normal radiographic relations of the nasogastric tube. On anteroposterior projection, the nasogastric tube lies slightly to the left of the tracheal tube or it. Beneath the tracheal bifurcation and at the level of mid thoracic vertebrae, the tube curves mildly to the right, away from the midline and then deviates slightly to the left lateral border at the lower thoracic vertebrae. Here, the nasogastric tube is passing through the region of the hiatus to join the cardia. On the lateral chest projection the nasogastric tube is in close contact with the endotracheal tube in front running parallel to and only slightly separated from the upper thoracic spine behind. At the level of the tracheal bifurcation the tube takes a gentle curve posteriorly and then anteriorly as the hiatus is reached. It meets the left diaphragm in its posterior half, anterior to the lower thoracic spine in a slightly oblique direction. Beneath the diaphragm, the tube continue its slight curve to join the cardia. Clues to diagnosis may be obtained from contrast study which may show collection of the contrast in the retropharyngeal pocket (pseudodiverticulum) or as narrow tract parallel and posterior to the esophageal column (submucosal perforation) or as a spillage of contrast material into the pleural cavity. An x-ray films of our patient was seen in **Figure 1** and **Figure 2**, which clearly shows the deviation of the orogastric tube from the normal course that was described above. Anteroposterior film also failed to demonstrate the dilated proximal esophageal pouch, which is usually seen in esophageal atresia. Further, the presence of pneumomediastrinum and pneumothorax should have aroused the suspicion but these findings were overlooked. Air fluid level and subcutaneous emphysema are additional signs of esophageal perforation which were absent in our case. Presence of double esophagus[5] in contrast study is another sign of esophageal perforation but contrast study in our patient did not show “double esophagus”. We did not attempt to visualize the perforation directly. In most cases, the esophageal perforation can be managed conservatively without direct repair of perforation, cervical or mediastinal drainage or gastrostomy.[6,12] Treatment should be selective and based not only on the type and extent of injury but the underlying condition of the newborn.[6] Our patient was managed conservatively with total parenteral nutrition, chest drainage, broad spectrum antibiotics and ventilation support. Feeding was initially started at the age of 7 days through orogastric tube. He was discharged at the age of 2 months. No complication was noted during follow-up.

In conclusion, attention of pediatricians is drawn to this important but rare clinical problem. Failure to pass orogastric tube does not always indicate esophageal atresia. Perforation of esophagus should always be suspected and x-ray should be discussed

with experienced radiologist or surgeon. Proper diagnosis of these cases can save them operative intervention as most cases can be managed conservatively as we did in our case.

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