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Case Report

Acquired Tracheo Esophageal Fistula: A Clinical Case report

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Abstract

A trachea esophageal fistula (TEF) is a congenital or acquired communication between the trachea and esophagus. TEFs often lead to severe and fatal pulmonary complications. It is a life threatening condition & usually occurs secondary to trauma or invasion of anatomic structures in the mediastinum by neoplasm and foreign bodies. It is uncommon for infants to ingest articles large enough to produce esophageal damage. Failure to diagnose foreign body ingestion at time can allow time for erosion into the wall of the esophagus with subsequent severe to profound injury to the esophagus, the trachea or both. Esophageal impacting of button batteries must be distinguished from impacting of other foreign bodies because of their severe complications. Button batteries represent a low percentage of all foreign bodies swallowed by children and esophageal location is even less frequent. Swallowed button batteries rarely remain in esophagus, Injuries can take place even after few hours; and therefore, endoscopy must be performed as soon as possible. We present a case of battery ingestion in a one-year-old infant resulting in acquired TEF. The history, diagnostic and surgical management was stressed in this case report.

Keywords: Acquired Trachea Esophageal Fistula; Infant; Battery Ingestion; Rigid Broncoscopy.

Introduction

Foreign body ingestion in children is a very common problem. It is estimated that 80% of all cases of swallowed foreign bodies occur in children, mainly between 6 months and 3 years of age. More than 90% of swallowed batteries pass through the gastrointestinal (GI) tract and do not cause a problem. Only, a minimum percentage of them remain in esophagus; moreover, these cases are developed with severe damage and later complications. Certain foreign bodies might cause severe injuries either because of their characteristic features or because of the level they become lodged at. An estimated 40 percent of foreign body ingestions in children are not witnessed, and in many cases, the child never develops symptoms. A retrospective review found that 50 percent of children with confirmed foreign body ingestions were asymptomatic. The incidence of button battery ingestion is about 10 cases in every million people every year, which is very low. If a battery becomes impacted in the esophagus, it may penetrate the esophageal wall and cause a tracheo-esophageal fistula (TEF). Thus early diagnosis and extraction of the battery are very important. Flexible versus rigid endoscopy for removal of foreign body impaction in the esophagus is useful. The risk of

development of TEF increases after the ingestion and its symptoms include food aspiration, fever, cyanosis, mediastinitis, pneumonia, and respiratory distress. The first step in suspected foreign body ingestion is a chest X-ray. In case more than several hours have passed since ingestion, it is recommended to perform a radiographic contrast test to rule out perforation.6 In some circumstances an esophageal foreign body may cause a meditational mass, which can be diagnosed by chest X-ray. Thoracotomy and fistula repair are also routine approaches. The present case report is describing history, diagnostic and management measures for the 1 year old infant with battery ingestion that ended as acquired trachea-esophageal fistula complicated with pneumonia.

Case Report

A one year female child with 7.8kg presented with complains of cough, vomiting after feeds, and difficulty in breathing on 7/09/2016 (2 days later on battery ingestion) parents brought child to AIIMS OPD, parents gave history of battery ingestion. Rigid Broncoscopy was done under general anesthesia and the foreign body was removed on 07/09/2016. In Investigation few large granular lymphocytes are noted. RBC size shows microcytes, few lymphochromic cells, few macrocytes and polychromophilic cells. Mild thrompocytopenia is present.after rigid broncoscopy the child was observed for any complication and got discharged home. After few days child game with the same complains associated with apple ingestion. She was diagnosed to have acquired trachea-esophageal fistula" & was admitted with a plan of surgery in order to keep the airway and GIT patent. Surgery: Thorocotomy was done on 08/09/2016. Wide tracheo-esophageal fistula 2-3cm proximal to larynx. Right thorocotomy was done, diverticulam of fistual, trachea and esophageal repair done. Tracheal repaird with using 5-0 prolene , esophageal repaird using 4-0 vicryl done with transverse closure of esophagotomy. Pleural flip applied between trachea and esophagus.

Child tolerated very well and showed significant improvement. Vitals are stable and general condition was good. Post operatively child was ordered for NPO, IV fluids, antibiotis and analgesics that includes IV fluids Iso –p 32ml.hour, Inj Cafotaxim 400mg IV 12 hourly, Inj Amikacin 80 mg IV 12 hourly, Chest tube care, and PCM suppository 170mg TDS. An NG tube was placed and feeding started on 2nd post operative period.on 11/09/2016 She was discharged with stable vital signs and NG tube in situ to be reviewed in OPD. On discharge advised to give 80 ml of NG feed at every 2 hours, syrup A-Z (Multivitamin) 1 tablespoon BD for 7 days, and Syp Iron 1spoon for 7 days were prescribed. Follow up done after 7 days in pediatric surgery OPD. NG tube was removed in OPD & child started to have oral feed.

Discussion

For the child thorocotomy was done as a surgical management to on 08/09/2016 inorder to protect tha patient airway. Wide tracheo-esophageal fistula 2-3cm proximal to larynx. Right thorocotomy was done, diverticulam of fistual, trachea and esophageal repair done. Tracheal repaird with using 5-0 prolene, esophageal repaird using 4-0 vicryl done with transverse closure of esophagotomy. Pleural flip applied between trachea and esophagus. Surgical approach was considered to be effective approach than conservative management to treat acquired TEF for the this child. This case report is supported by Yalçin. et all study on Management of acquired tracheoesophageal fistula with various clinical presentations. The result showed Five girls and two boys with a median age of 36 months (range, 2-156 months) were treated for acquired tracheoesophageal fistula. The presenting symptoms were respiratory difficulty (n = 3), coughing (n = 2), and dysphagia with coughing (n = 2), with a median duration of 30 days (range, 1-730 days). The etiologies were disc battery ingestion (n = 3), placement of endoesophageal prosthesis for caustic esophageal stricture (n = 2), corrosive ingestion with extensive burn (n = 1), and blunt chest trauma with subsequent emergency tracheotomy (n = 1). The site of the fistulae were proximal (n = 3) and middle (n = 1) trachea, left main bronchus (n = 1), and nearly the entire posterior wall of the trachea (n = 2). The patients were variously managed: conservatively with eventual spontaneous closure (n = 1), primary repair (n = 2), and colon interposition after cervical esophagostomy (n = 4) based on the clinical evaluation on admission and the follow-up status. Stenosis of the proximal esophagus (n = 2) and esophagocolonic anastomosis (n = 2) were the only complications encountered after treatment and were successfully managed with dilatation. The best therapeutic approach for acquired tracheoesophageal fistula can be determined with careful consideration of relevant parameters on admission, including medical history, presenting findings, etiology, and characteristics of the fistula, in addition to the clinical evaluation in

the follow-up period. In general, conservative management should precede definitive surgical intervention both to allow for possible spontaneous closure and also to achieve optimal preoperative status. Primary repair or a staged surgical approach can be best selected by giving priority to the patient's airway security.

Acquired trachea-esophageal fistula (TEF) is a rare complication of foreign body ingestion, and most commonly occurs when older children ingest button-type batteries or coins [1,2,3]. To our knowledge, there have been no reports of an acquired trachea-esophageal fistula in an infant. This is of note because the small size of the airway in children less than one year of age can readily and rapidly produce devastating hypoxic injury during attempts to diagnose and make the necessary anatomic repairs.

According to the American Association of Poison Control Centers for the year 2005, there were 5100 cases of non-automotive battery ingestion and 12,740 cases of ingestion of toys or coins in children less than 6 years of age. Despite this huge volume, outcomes are usually good. There were 16 major reaction outcomes and 1 death from battery ingestion and 5 major reaction outcomes and 0 deaths from coin or toy ingestion. Many of these ingestions are not witnessed, and it has been shown that nearly 50% of children with known foreign body ingestion are asymptomatic. Thus it is likely that the true number of uneventful foreign body ingestions in children is much higher.

Button batteries represent about 2% of all foreign bodies, although this percentage seems to be increasing. Epidemiology of button battery ingestion seems to be changing trends in the last years and there are more cases of severe complications related to them, which were reported recently. They seldom remain in the esophagus; however, these few cases are prone to develop severe injury even after some hours.

Button batteries that are located in esophagus can cause damage mainly by four different and independent mechanisms.

- First, they might cause damage in surrounding tissue because of direct pressure, as any other foreign body, although this mechanism alone should not cause severe injuries.
- Secondly, batteries containing mercury have been proved to release it, making its absorption to systemic circulation possible and, therefore, risking systemic toxicity.
- Alkaline leakage can take place when button batteries are immersed in saline solution. It may cause caustic damage in esophageal mucosa as well. Alkaline burns are characterized by liquefactive necrosis, fat saponification, and inflammatory cell infiltration and they represent the most severe histologic damage caused in surrounding tissues.
- Finally, experimental models in animals have shown that a button battery can complete an electrolyte circuit when lodged in esophagus, releasing enough electrical energy to burn surrounding tissues immediately and, in addition, the generation of this external electrolytic current might hydrolyze tissue fluids and produce hydroxide at the battery's negative pole.

Management of esophageal button battery requires early diagnosis, therefore suspecting diagnosis in children with characteristics foreign body ingestion is mandatory. Obtaining a thorough history from caretakers or potential witnesses to the ingestion will be helpful in identifying a foreign body. A chest X-ray image should be performed whenever ingestion is suspected, even in the presence of non-specific symptoms, if foreign body ingestion cannot be ruled out by clinical history. A chest X-ray image will be enough to recognize the round foreign body with double-ring shadow or double density, which makes it different from a coin. They are also slightly more translucent and show a step-off on lateral radiographic views, which can easily be obtained if there is any doubt.

Once diagnosis is established, endoscopy should be performed as soon as possible. Some other methods have been reported to remove the battery as using emetics, a Foley catheter or a magnet. They do not seem to be safe enough and a complete exploration of esophagus should be performed in order to check esophageal mucosa, to assess injury caused and to rule out early complications.

When the button battery is located beyond the stomach, serial radiographic examinations should be used to monitor its progress and to ensure it continues to advance through the intestinal tract.

When an elementory body is found, it seems reasonable to set a nasogastric tube, start gastric protection treatment with proton-pump inhibitors, and nil per oral until either a radiological contrast study or endoscopy is performed 2 or 3 days later to make sure there is no further damage.

Esophageal stenosis is probably the most common complication after elementory body due to button battery ingestion, even if it is seems to be under-reported. Endoscopic balloon dilatation seems to be

a safe and effective solution in these cases. .

Finally, prevention is the best management of all. Parents and caretakers should be aware of the potential danger of button battery ingestion and the importance of providing immediate care. Security of devices containing button batteries should be reviewed in order to find the way they cannot be released by children. In addition, the permanence of the battery in esophagus determines the risk of severe injuries; and therefore, the establishment of a maximum size by manufactures will diminish the probability they become lodged there. None of the more severe consequences of battery ingestion were reported to happen in small batteries.

Conclusion

Even though The incidence of button battery ingestion is about 10 cases in every million people every the incidence of button battery ingestion is increasing in the last years and the early diagnosis when they become lodged in esophagus, is of capital importance to diminish the risk of potential fatal complications. Endoscopic/bronchoscopic removal and a close follow-up by a multi-disciplinary group of physicians are essential to deal with both early and late complications.

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