An Interesting Rare Case of Subcutaneous Emphysema

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ABSTRACT

Subcutaneous emphysema in the region of neck is an uncommon presentation in cases admitted in medical wards.Esophageal perforation is the most serious cause of subcutaneous emphysema and may be associated with high mortality.Foreign body impaction as a cause of perforation of esophagus is rare in adults and diagnosis may be difficult in initial stage if clear history is not narrated, or if the patients present late and especially if it is associated with complications, like secondary infection. We report a case of subcutaneous emphysema in neck , which developed due to penetration of esophagus and larynx by a foreign body, (a mutton piece). The subcutaneous emphysema got secondarily infected and caused airway compromise. The patient improved when the mutton piece, which was found partly in the esophagus and partly in the larynx on CT scan, was surgically removed.

INTRODUCTION

Subcutaneous emphysema is an uncommon clinical entity managed by physicians and when present is commonly associated with pneumothorax. Trauma, necrotizing infections and instrumentation being the common causes, esophageal perforation is the most serious condition leading to subcutaneous emphysema. Foreign body impaction or penetration resulting in perforation of esophagus is rare in adults, though common in children. Esophageal perforation, a potentially life threatening condition is more frequently noted in lower esophagus. However, perforation caused by foreign body obstruction is more frequently reported in cervical part of esophagus 1,2 and is followed by neck emphysema and carotid –pharyngeal fistula. Other complications like pleural effusion pneumomediastinum, hydropneumothorax, air in the subdiaphragmatic space, aspiration pneumonia, esophago-aortic fistula or cardiac tamponade and mediastinitis are more commonly observed in lower esophageal perforation3 .Boerhaave's syndrome, esophageal perforation caused by forceful or resisted vomiting associated with raised intraesophageal pressure and ingestion of caustic products are other causes. Coins, crayons, buttons and marbles are the common foreign bodies recovered from esophagus in children, fish bone and chicken bone are common in adults. Others include food bolus, fruit pits, tooth pics and dentures. Prisoners and psychiatric patients may ingest multiple or bizarre objects including packages of drugs (body packing) or razor blades4 . Sharp objects and objects which remain in esophagus for more than 24 hours are high risk foreign bodies for development of fistula, stricture or erosion through wall. Radiographs can detect foreign bodies in 90% but in presence of complications it can fail the diagnosis in 50% of foreign bodies in the neck region. CT scan is useful for diagnosis when X- ray is negative and for detection of perforated espophagus.Most of the foreign bodies can be removed via esophagoscopy and rigid esophagoscopy may be preferred over flexible if foreign body is sharp because larger area is visualized and removal may be easy.5 Surgery may be required for management of esophageal perforation especially if associated with complications and located in lower 1/3rd of esophagus and Boerhaave's syndrome Esophageal perforation carries a high mortality if associated with complications, in Boerhaave's syndrome and In the cases who report late .

A 55 years old male patient was brought in the emergency room on 8th April 2010 with the complaints of Breathlessness and cough with expectoration since 8 days Fever, pain and swelling in neck, dysphagia , change in voice and chest pain 6 days prior to

admission. Patient was a chronic smoker (20 bidies per day for the past 25 years)and an occasional alcoholic(40 grams per week)On clinical examination patient was Afebrile, had tachycardia (128/min) Dyspneic, (respiratory ate36/min. His Blood Pressure was normal(130/80) ,had grade II clubbing and a hoarse voice. However cyanosis was not present. His Jugular Venous pressure was raised. Engorged, Tortous, Distended Non pulsatile neck Veins were visible on the Anterior chest wall and Both the arms. Palpable crepitus (subcutaneous l emphysema was present on Right posterior triangle, Anterior aspect of neck and and also on left side of neck. Hamman's sign –(crunchy sound synchronous with heart beat suggestive of mediastinal emphysema) was not present. Left supraclavicular and sternomastoid group of lymph nodes were palpable 1.5 cm in diameter and were tender. Patient had laryngeal stridor. Respiratory system examination revealed decreased breath sounds on both sides and bilateral occasional rhonchi .Cardiovascular system examination was normal except tachycardia.

Patient was investigated with the aim of finding the cause of subcutaneous emphysema as there was no history of trauma,instrumentation or surgery, Dental infection, and no clinical signs of pneumothorax on examination. Patient's X-ray revealed signs of COPD and presence of Subcutaneous Emphysema on right side in the region of neck extending upto anterior chest wall.

As this case had subcutaneous emphysema in neck region, no evidence of pneumothorax- on X-ray chest ,and history of dysphagia it was thought that whether the air leak is from oesophagus .Patient was subjected for CT scan neck and thorax which revealed interesting finding in the form of Thin LInear Foreign body approximately 3.5 3..8cm in length placed obliquely with medial end placed in lumen of upper cervical oesophagus just below the level of cricoids and lateral end placed in between the posterior tip of left thyroid cartilage and left common carotid artery.CT scan also demonstrated Subcutaneous Emphysema involving neck upper thoracic chest wall also extending along trachea and oesophagus in superior mediastenum. However there was no evidence of pnemothorax .

Retrospectively, on asking the history patient told that a Mutton piece got stuck in throat 10 days prior to admission immediately after which patient had sense of obstruction in throat region.Odynophagia and breathlessness .Patient drank lot of water,ate bananas and actually massaged his throat for about 1 hour.Next day morning he noticed swelling in neck and subsequent symptoms already mentioned earlier,went to rural health care centre was admitted for 3 -4 days .but had no relief ,his symptons worsened and hence referred to our institute.However before this, he did not reveal this History of foreign body obstruction to his family members and Doctors.

Patient's Haemogram,Blood counts and kidney function tests were normal at the time of admission Serum sodium and potassium was also within normal limits.patient maintained Oxygen saturation at 96% and blood pH ,pO2 pCO2 HCO3 was normal. As patient had Airway compromise,Emergency Tracheostomy was performed under local anaesthesia and cuffed tracheostomy tube of 8.5 size was inserted .

With the aim to remove foreign body, esophagoscopy was performed on 9th April 2010 with a rigid esophagoscope 4.5, which revealed clear pyriform fossa on both sides. Bilateral anterior triangle and right subcutaneous plane was dissected and 4-5 cc of pus could be drained along with serous fluid. Milking of air was done to relieve subcutaneous emphysema. However, no foreign could be visualized or removed. On 12th April 2010, under general anaesthesia, via tracheostomy, left horizontal incision was extended medially after dissecting layers straps of muscles separated,thyroid cartilage was exposed on left side and vertically placed whitish foreign body on posterior aspect of left thyroid lamina was removed. Hemostasis was achieved and rubber drain inserted.

Patient received supportive treatment in the form of Oxygen inhalation, injectable ceftriaxone, Metronidazole, Intravenous fluids, deriphylline,

nebulised salbutamol and steroids and ranitidine. Patient was kept nil by mouth for about 2 weeks. After 2 weeks patient developed fever, swelling of neck and breathlessness increased. Chest radiograph revealed consolidation left lower lobe, and blood urea and creatinine values increased. Septicemia was suspected and patient was treated with higher antibiotics (Imipenem Cilastatin). Patient responded to antibiotics, pneumonia resolved and swelling in neck decreased. Ryle's Tube of size 14 could be inserted and patient was subsequently put on Ryle's tube Feeding.
On 11th May2010, for deciding whether perforation has healed completely or not, an oral contrast bolus was administered which delineated a fistulous tract arising from left lateral wall of esophagus just below the thyroid lamina and extending anterolaterally to surgical scar. CT scan, however did not demonstrate any obvious direct trachea-esophageal communication, except a small contrast seen into the trachea on delayed scan image, possibly due to contrast from above in the region of pyriform fossa (from oral contrast agent, aspiration). Great vessels, thyroid gland, neck musculature, were normal and no obvious lymphadenopathy was present.

Patient was again kept nil by mouth and the leak stopped. Ryle's tube feeding could be successfully restarted. On 22nd May2010 Tracheostomy tube was deflated, Fenestrated tube passed, and strapping done. Tracheostomy tube could be removed on 23rd May, 2010. Patient accepted oral feeds on 24th may 2010 and was successfully discharged from the hospital.

Discussion

Subcutaneous emphysema in the region of neck , unaccompanied by pneumothorax is a rare medical condition encountered by physicians. Esophageal perforation because of foreign body penetration is a life threatening condition and may have high mortality if patient presents late. Though cases of foreign bodies in the esophagus present frequently, in our case, diagnosis was initially difficult because history of foreign body impaction was not narrated by the patient. Cases of foreign body obstruction are seen frequently in children, our patient was an adult. Perforation of esophagus is reported to be more common lower 1/3rd in adults, in our case, it was demonstrated in upper 1/3 rd Conway Wc 6has mentioned that 75% of children have entrapment of Foreign bodies at upper esophageal sphincter and 70% of adults have foreign bodies at lower esophageal sphincter.

Eroglu et al7 has reported site of esophageal perforation to be more common in lower 1/3rd than upper 1/3rd .Lower 1/3rd perforation is more commonly associated with extensive mediastinal emphysema, mediastinitis and may involve pleura causing pneumothorax .perforation in the upper 1/3rd would result in surgical emphysema involving neck region and mediastinal emphysema in superior mediastinum. As presented late, our patient already had complications in the form of secondary infection , Subcutaneous and Mediastinal Emphysema.Complications of esophageal foreign body ingestion are in the form of mucosal scrathes,abrasions,perforation secondary infections or abscesses.Pneumomediastinum,mediastinitis,pneumothorax,pericarditis or tamponade and injuries to aorta or pulmonary vasculature is also reported rarely resulting in fatal haemorrhages. 8 Our case had no evidence of pneumothorax because the perforation was present in lower 1/3rd of the esophagus(cervical part).

Foreign body in the present case is quite large in size, could be sharp and has caused through and through perforation from the wall of the esophagus, so as to enter into the thyroid cartilage and thereby L.aryngeal Airways. History of external massage done by the patient himself in order to relieve the sense of obstruction might have been responsible for the displacement of foreign body ,perforating the wall of esophagus and entering the Laryngeal Airways. There are only a few case reports about the foreign bodies entering through esophagus ,perforating and penetrating into the Laryngeal Airways in the Literature. A Salisu9,in 2010 reported a foreign body in a magician which penetrated through the esophagus

and and was found partly in the esophagus and partly in the Larynx. Sao Paulo 10in April 2009 studied 3000 cases of foreign bodies in Gastro-intestinal tract and reported extraluminal migration of foreign bodies in 4 cases ,2 in the neck and 1 towards aorta which resulted in death because of haemorrhage. Author has reported that before penetration there is a foreign body fixation on the wall of esophagus causing peri esophagitis and peripharyngitis which can evolve into abscess. Perforation is followed by chest pain, fever, subcutaneous emphysema, dyspnea and dysphagia. These symptoms do not help to achieve a clear diagnosis because they overlap with symptoms of other disorders of same anatomical region or with intraluminal foreign bodies .

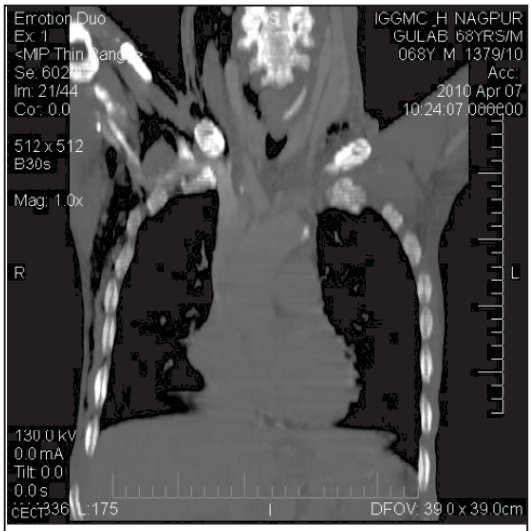
Katsetos Mc 11 described esophageal oerforation and mediastinitis from Fishbone ingestion. Radiographs can detect radio-opaque foreign bodies,but may not be useful in presence of complications , if the foreign bodies are radioluscent and located in the neck region. CT scan is useful for diagnosis when X- ray is negative. Barium swallow is contraindicated in cases where esophageal perforation is suspected.CT scan is superior to plain radiographs for localization and identification of foreign bodies and visualisation of non radio-opaque foreign bodies.CT scan is also the imaging modality of choice in cases of suspected esophageal perforation.12 Patients with airway compromise need acute airway management followed by Emergency Endoscopy and is indicated when complications are present. Endoscopy is absolutely indicated for foreign bodies those are sharp,non radio-opaque or elongated and multiple or for possible injuries to esophagus ..Endoscopy is the most commonly used technique for active management of impacted esophageal foreign bodies ,for visualization and removal of foreign bodies, is relatively safe and effective12

More surprising was the inability to remove the Foreign Body by osophagoscopy in our case, which could be explained on the basis of Migration of Foreign Body from the esophagus because of massaging by the patient himself .Foreign body which entered the esophagus could be successfully removed through tracheostomy stoma by extending the incision and dissection, indicates that removing the foreign body was a technically difficult task. Patient already had developed secondary infection, enlarged and tender lymph nodes, which could be successfully treated with antibiotics and pus drainage. Consolidation, which developed later, also responded to antibiotics. Aggregation of oral contrast agent at the site of tracheostomy wound, which was demonstrated on 11th May 2010 was probably not because of persistant tracheo-esophageal Fistula. It could be either Aspiration,or leak from the esophagus into the subcutaneous space near the tracheostomy wound rather than actual penetration into the trachea. However,it could be managed conservatively and subsequently Ryle's tube and tracheostomy tube could be removed, and oral feeding could successfully introduced without any complications.

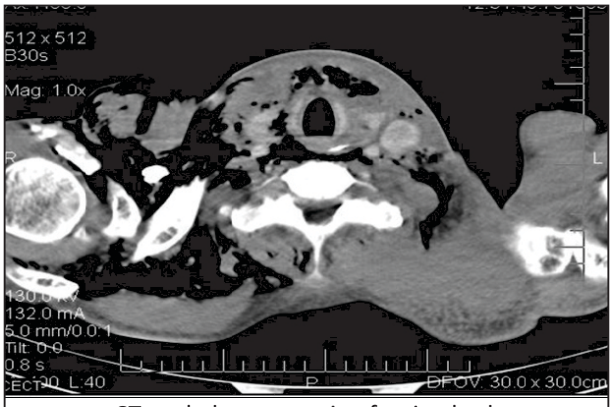
Mortality described by Bladergroen in cases of esophageal perforation is high (21%)13 In spite of patient presenting late,had esophageal perforation, penetration into respiratory airways, could be managed successfully in the medicine ward of Indira Gandhi Government Medical College. Many cases of esophageal perforation because of foreign body needs to be treated surgically, our case could be managed conservatively.

Clinical photograph of the case demonstrating engorged veins in the neck and chest wall

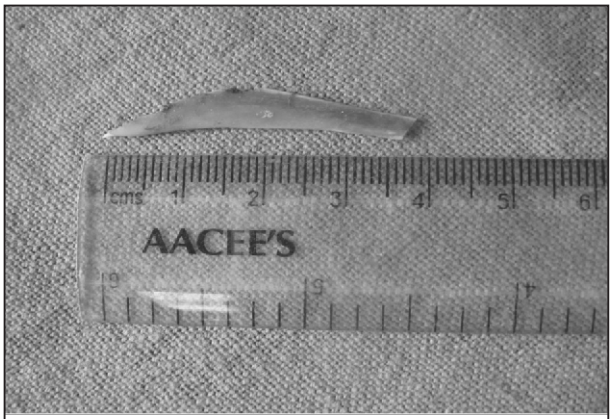
X Ray Chest showing subcutaneous emphysema



CT neck MPR image demonstrating foreign body partly in the esophagus and partly in the larynx and subcutaneous emphysema



CT neck demonstrating foreign body, subcutaneous and mediastinal emphysema



Removed foreign body ,A mutton Piece

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