

Post-Intubation Tracheal Tearing in a Young Woman with Rheumatoid Arthritis

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Abstract

Tracheal tearing occurs rarely and if not detected early, can be life-threatening and lead to death. Tracheal tearing has different risk factors and knowing these risk factors and proper management of the airway can reduce the appalling events. Treatment options include conservative management without surgical repair, surgical repair, and treatment with endoscopic intervention. Studies have discussed various aspects of treatment of tracheal tearing, but standard treatment is surgical repair. Here, we introduce a woman with post intubation tracheal tearing and several risk factors that successfully improved with surgical treatment.

Keywords: Post intubation; Trachea; Tearing; Rheumatoid arthritis

Introduction

Tracheal tearing is a rare but life-threatening event. This can occur in a patient with predisposing anatomic and medical factors or can be due to technical problems [1]. If it happened, it should be diagnosed as soon as possible and quick intervention is needed. Although conservative treatment has been explained in several case reports, but surgery is recommended as choice treatment [2]. Treatment options are selected based on the size and location of the tearing, clinical features and overall condition of the patient and patient's comorbidity [3].

Case Presentation

34-year-old woman with short stature (weight: 60 kg, height: 155 cm) was admitted in 5 Azar hospital, Gorgan, Iran due to extensive subcutaneous emphysema after laparoscopic cholecystectomy. Patient had a history of rheumatism disease from 7 years old and diagnosis of rheumatoid arthritis when she was 18 year old. She also had history of diabetes and hypertension. List of the used drugs was as follows: Prednisolone (10 mg/day), Hydroxy chloroquine (200 mg/day), Losartan (25 mg twice a day), Insulin (5 unit Regular-15 unit NPH in the morning and the same dose in the night). She was using corticosteroid for at least two decades and Insulin for 3-4 years. Two hours after removal of the endotracheal tube at the end of uncomplicated laparoscopic cholecystectomy, following a sever cough, progressive subcutaneous emphysema appeared, but she was hemodynamically stable. Although the patient had multiple predisposing factors, but Pre-operative evaluation in this patient was not complete and the anesthesiologist did not monitor the pressure of the endotracheal cuff. HRCT showed massive subcutaneous emphysema and pneumomediastinum without any evidence of pneumothorax (Figure 1). After consultation, she was transferred to our hospital and became candidate for rigid bronchoscopy. By a rigid bronchoscope 7.5 Storz, tracheobronchial evaluation was performed with caution. 4 cm longitudinal tearing in the membranous trachea was observed. There was 2 cm interval between the end of the tearing and carina. She became intubated with armored endotracheal tube and

in left lateral decubitus position, right posterolateral thoracotomy was performed. Tearing was repaired with interrupted suture with prolene 3-0 (Figure 2).

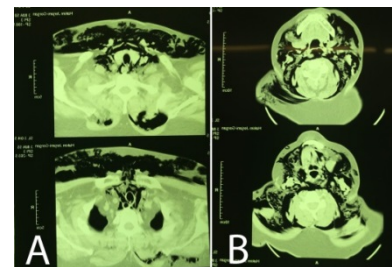


Figure 1: Neck and Thorax CT scan of the patient: A) Subcutaneous and mediastinal emphysema, B) Neck emphysema.

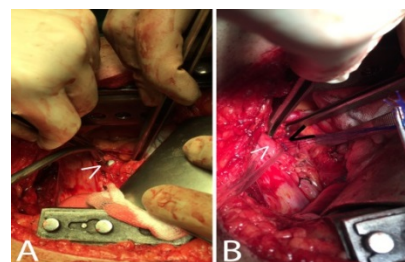


Figure 2: A) White arrow shows tracheal perforation, B) White arrow shows the oesophagus and black arrow shows trachea after repair.

Pleural flap was interposed between trachea and oesophagus. Chest tube (No. 32) was inserted into the right pleural cavity and chest incision was closed in the conventional manner. At the end of the operation, she became extubated and was transferred to surgical ICU. Although, management of the patient was hard due to multiple

comorbidities but she discharged on day 12 without any adverse event. She was followed with CT scan and fiberoptic bronchoscopy and after one year follows up, she has no problem.

Discussion

Post intubation tracheal tearing is uncommon but a life-threatening event with morbidity and mortality. In all population, the incidence rate of tracheal injury following endotracheal intubation has been reported between 0/005-0/12% [4]. Various factors can lead to tearing of the trachea. First, technical errors, including intubation by force, inexperienced hands, inappropriate tube size, over distended cuff. Second, factors related to the patient condition, consist of tracheal anomalies, old age patients, chronic corticosteroid therapy, short stature, female sex and COPD [5-7].

Rheumatoid arthritis is a chronic inflammatory disease that affects different systems in the course of the disease. Two different aspects make the anesthesia high risk for these patients. First, anatomical deformity in this disease can lead to difficult intubation in these patients. RA may affect the axial skeleton in the neck, even in the early stage of the disease. Radiological evaluation of the cervical area in different position is needed to reveal atlanto-axial subluxation. In these patients hyperextension of the neck should be avoided. RA can affect temporomandibular joints with ankylosis, thus leading to the small mouth during intubation. Laryngeal involvement is common in patients with rheumatoid arthritis. In the preoperative and postoperative phase, patients should be evaluated for signs of laryngeal dysfunction. Secondly, involvement of different organs such as kidney, lung, heart and liver increases the risk of anesthesia [8]. Also, rheumatoid arthritis and treatment with corticosteroids can weaken connective tissue that predisposes the trachea to rupture.

When tracheal tearing occurs, it's more commonly seen in membranous trachea. Signs and symptoms of tracheal tearing include: subcutaneous emphysema, pneumomediastinum, pneumothorax, dyspnea, dusphonia, cough and hemoptysis. Subcutaneous emphysema is sentinel sign of tracheal rupture [9].

High index of suspicion is necessary to diagnose tracheal tearing early in the course of the event. Bronchoscopy is the method of choice to delineate the tearing. Fiberoptic bronchoscopy can guide the anesthesiologist to intubate the patient. Rigid bronchoscopy can help to establish diagnosis, and delineate the type, size and location of tearing [10].

Tracheal tearing treatment strategy depends on the size and location of the rupture, clinical features and overall condition of the patient and the patient's comorbidity [2]. Conservative therapy involves inserting a tube cuff distal to the lesion, chest drainage, continuous airway humidification, broad spectrum antibiotics, cough suppression, chest physiotherapy and enteral or parenteral nutrition [10]. Conservative

treatment is not appropriate for tearing close to the carina [2]. In patients who are unstable, tearing in the distal trachea, and long tearing larger than 2 cm, surgical repair is the main treatment [4]. Distal two third of the trachea is repaired through right posterolateral thoracotomy and proximal one third is repaired through cervical incision [2].

Removable stents are viable options in patients who have long tearing that are not suitable for surgery or tearing that need cardiopulmonary bypass for repair. Non-removable stents don't recommend in these cases and removable tracheal stents can be safe [3].

In conclusion we suggest that in patients with risk factors for intubation to be fully assessed, intubation to be performed by an experienced anesthesiologist, cuff pressure should be monitored and risk factors reduced. The choice of treatment should be decided separately for each patient who depends on various factors.

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