



Case report

Tracheomegaly and tracheoesophageal fistula following mechanical ventilation: A case report and review of the literature



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ABSTRACT

Postintubation Tracheoesophageal fistula (TEF) is a rare complication. Acquired TEF most commonly occurred following prolonged mechanical ventilation with an endotracheal or tracheostomy tube, cuff-related tracheal injury, post-intubation injury. We present a case of both tracheomegaly and tracheoesophageal fistula following mechanical ventilation for 15 days, in the light of the literature.

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1. Introduction

Tracheoesophageal fistula (TOF), which is a life threatening condition, may be congenital or acquired. It is the connection between the esophagus and the tracheobronchial tree or the other mediastinal structures. Most of the patients with TOFs are diagnosed following birth or during infancy. Acquired TOFs mostly occur secondary to several malignancies (i.e. esophageal cancer), infection, ruptured diverticula, and injuries [1]. Figs. 1–4

Post-intubation TOFs infrequently occur following prolonged mechanical ventilation with an endotracheal or tracheostomy tube, cuff-related tracheal injury, and post intubation injury.

Tracheomegaly is marked dilatation of the trachea. It is associated with long-term smoking, chronic bronchitis, pulmonary emphysema, cystic fibrosis, pulmonary fibrosis, multiple

chondritis, and Ehlers–Danlos syndrome [2]. Due to mechanical ventilation with high cuff pressures, acquired tracheomegaly may also develop [3]. In addition, acquired TOFs are common following prolonged intubation. They may develop within 12–200 days of mechanical ventilation [4]. Predisposing factors for an acquired TOF are poor overall health, poor nutritional status, airway infections, episodic hypotension, restless/awake patients, diabetes mellitus, steroid therapies, posterior counter-pressure by nasogastric tubes, and long-term mechanical ventilation [5].

Herein, we present a 64-year-old female case of both tracheomegaly and a TOF following mechanical ventilation for 15 days.

2. Case report

A 64-year-old quadriplegic women (height:150 cm, body weight:45 kg) was admitted to the intensive care unit due to respiratory failure in another facility. She had been quadriplegic for six years. She received controlled mechanical ventilation for respiratory failure due to pulmonary infection for three weeks. She was followed by bi-level positive airway pressure (BIBAP) ST mode for one week. She was referred to the palliative care unit in our hospital

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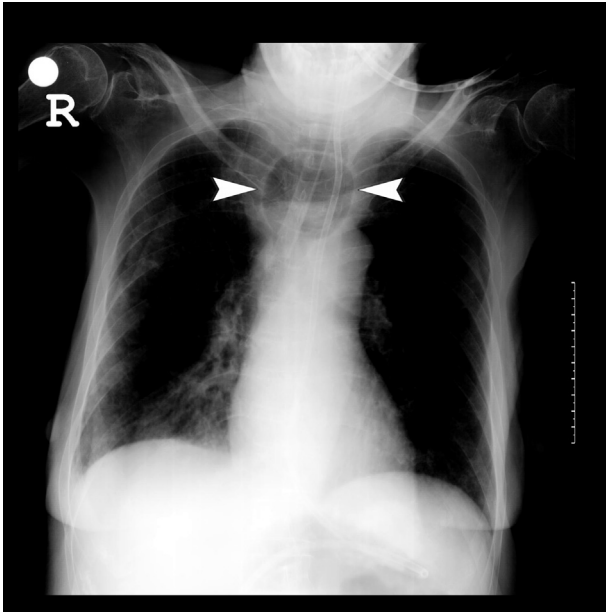


Fig. 1. On plain thoracic X-ray, Tracheomegaly and cuff of endotracheal tube can be seen (arrow head).

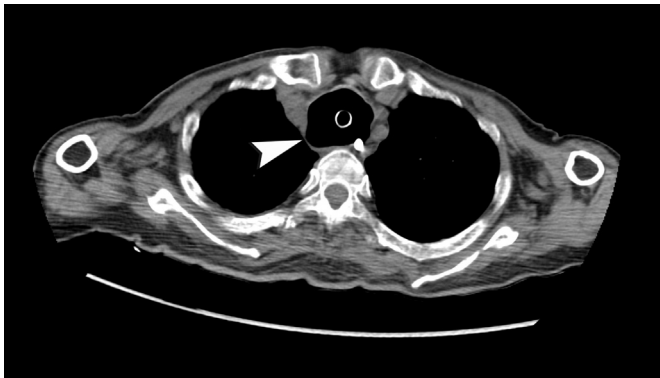


Fig. 2. On CT examination Tracheomegaly and cuff of endotracheal tube in trachea and nasogastric tube were seen in Fig. 2, and fistula was seen Fig. 3 (arrow heads).

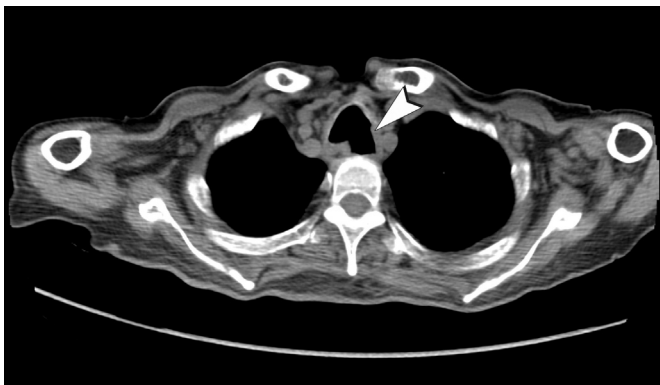


Fig. 3. On CT examination Tracheomegaly and cuff of endotracheal tube in trachea and nasogastric tube were seen in Fig. 2, and fistula was seen Fig. 3 (arrow heads).

to instruct her husband on feeding the patient via the nasogastric tube and using BIBAP-ST at home. However, we were unable to feed



Fig. 4. Bronchoscopic examination confirmed fistula (black arrow head), nasogastric tube (black arrow), also carina could be seen (White arrow).

her via the nasogastric tube. We noticed bubbling on her chest resembling an accumulation of sputum. The arterial blood gas showed severe hypoxemia: pH: 7.27, PaCO₂: 66.28 mmHg, PaO₂: 53.4 mmHg, HCO₃⁻:11. She was re-intubated with an 8-mm endotracheal tube in our intensive care unit. We inflated the cuff with 15 mL air due to the peritubal air leakage to control ventilation. The thoracic X-ray revealed that the maximum transverse diameter of the trachea was 6 cm on the thoracic computed tomography (CT) and the maximum transverse diameter of trachea was 4.2 cm (GE, Lightspeed VCT, USA). She developed tracheomegaly during mechanical ventilation. Despite re-intubation, we were unable to feed her via the nasogastric tube. A milky substance similar to tube feeding material was also aspirated from her endotracheal tube and a TEF was highly suspected. Thoracic CT scan revealed a TOF between the mid-esophagus and the tracheal carina and bronchoscopy demonstrated a fistula 3 cm in diameter located at the membranous portion of the carina. The patient was placed on total parenteral nutrition (TPN) and treated conservatively. After bronchoscopy and consultation with thoracic surgeon, we considered that there was no chance for treatment due to the localization and large diameter of the fistulae. Spontaneous healing of fistulae was waited. Gastrostomy and feeding jejunostomy were performed to drain the gastric content and facilitate feeding.

3. Discussion

Tracheomegaly is often diagnosed when the transverse diameter of the trachea is greater than normal and exceeds 25 mm and 21 mm in men and women, respectively. Our patient had a 6 cm transverse diameter of the trachea on the chest radiography, and 4.2 cm in diameter on the thoracic CT. The etiologies of tracheomegaly are various. Some authors suggest that tracheomegaly can develop by ventilator therapy, barotrauma, smoking, and chronic irritants. During mechanical ventilation, pressure on the tracheal

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