

What is Wrong with the Giant Trachea?

Sir,

A 79-year female with motor neuron disease (MND) presented with difficulty in expectoration and progressive dyspnea for three months. She was unable to be extubated, so a tracheotomy was performed. A CT scan indicated that the diameter of the trachea was 17×17 mm, eight days after tracheotomy (Figure 1A). The patient received another pneumotomy cannula (model: Smith PORTEX PX-100810) and was discharged from hospital after one month of treatment. She was taken care of by a non-professional nurse at home; however, the tracheostomy tube was not changed regularly and the balloon of the cannula was not deflated. She was admitted to hospital again because of recurrent difficulty in expectoration and dyspnea. A chest CT scan revealed a large trachea measuring 31×28 mm (Figure 1B). The patient underwent a bronchoscopy that showed mucous membrane of the trachea to be smooth. No mucosal injury and scar tissue was found, but the membranous part of trachea was obviously dilated 2.5 cm below the glottis (Figure 2). A chest radiograph and bronchoscopy was repeated one year later (Figure 1C). There was no significant improvement. In this case, the tracheal dilatation was likely to be due to increased cuff pressure.

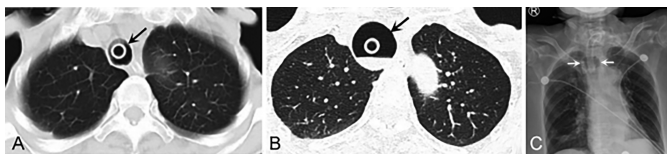


Figure 1: (A) Chest CT scan showing tracheal size (trachea measuring 17mm×17mm) (arrow). (B) Chest CT scan showing tracheal size (trachea measuring 31mm×28mm) (arrow). (C) Chest radiograph reassessed one year later, showing large trachea.



Figure 2: Bronchoscopy shows a confirmed giant trachea.

Iatrogenic tracheal injuries (ITIs) are rare; but potentially serious complications of endotracheal intubation, with an estimated incidence of 0.005%.¹ The most common site for tracheal injuries from blunt trauma is within 2.5 cm of the carina. A CT scan is useful for diagnosis, but bronchoscopy is still the gold standard. Giant trachea is a rare condition, which is classified as congenital and acquired. Mounier-Kuhn syndrome is a congenital disorder; and the most common cause of tracheobronchomegaly.

It results from the absence or atrophy of elastic fibers in the trachea and main bronchi, as well as the thinning of the smooth muscle layer.² Acquired cases of giant trachea have been reported in connective tissue diseases like Ehlers-Danlos, Marfan's syndrome, cutis laxa and ankylosing spondylitis.^{3,4} There is no relevant report of iatrogenic tracheobronchomegaly at present.

This case illustrates a case of acquired tracheobronchomegaly, whose etiology is unclear and may be multifactorial. The following three mechanisms are considered in this case: (1) excessive balloon pressure caused by unprofessional tracheotomy nursing; (2) expansion of the trachea under normal low-pressure, high tension balloon conditions; (3) dysphagia and malnutrition secondary to MND leading to atrophy of smooth muscle tissue (BMI was 9.6 kg/m² on second admission). Some measures to avoid such a condition are: (1) Dynamic cuff pressure monitoring; and chest imaging are effective ways to avoid pressure-related tracheal injury; (2) When bronchoscopy is performed, attention should be paid to the trachea above the balloon; (3) Regular balloon extraction and measurement of balloon volume may also be an effective way to avoid volume-related tracheal injury.

PATIENT'S CONSENT:

Informed consent has been obtained from the patient.

CONFLICT OF INTEREST:

The authors declared no conflict of interest.

AUTHORS' CONTRIBUTION:

LS: Authored the original draft.

XC: Reviewed and edited the paper.

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