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Visual Diagnosis in Emergency Medicine

INADVERTENT TRACHEOSTOMY CUFF HYPERINFLATION CAUSING TRACHEAL DILATION

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INTRODUCTION

Tracheal cuff hyperinflation can have serious complications resulting from decreased tracheal mucosal blood flow and range in severity from tracheal ulceration and necrosis, formation of tracheoesophageal or tracheoinnominate fistulae, recurrent laryngeal nerve injury, to fatal tracheal rupture (1).

CASE REPORT

A 69-year-old man with an extensive past medical history, including chronic respiratory failure secondary to amyotrophic lateral sclerosis, leading to ventilator dependence via tracheostomy, presented to the referring hospital with shortness of breath and an inability to deep suction by caregivers. Of note, twice in the previous 2 weeks, his tracheostomy cuff had ruptured, requiring replacement of the tracheostomy tube. He was transferred to our Emergency Department and subsequently to the surgical intensive care unit for further management.

Upon arrival, the initial chest radiograph (Figure 1; left) revealed an overinflated tracheostomy tube cuff. The initial cuff pressure was > 90 cm H_2O, as measured by manometry. Thoracic surgery and otolaryngology

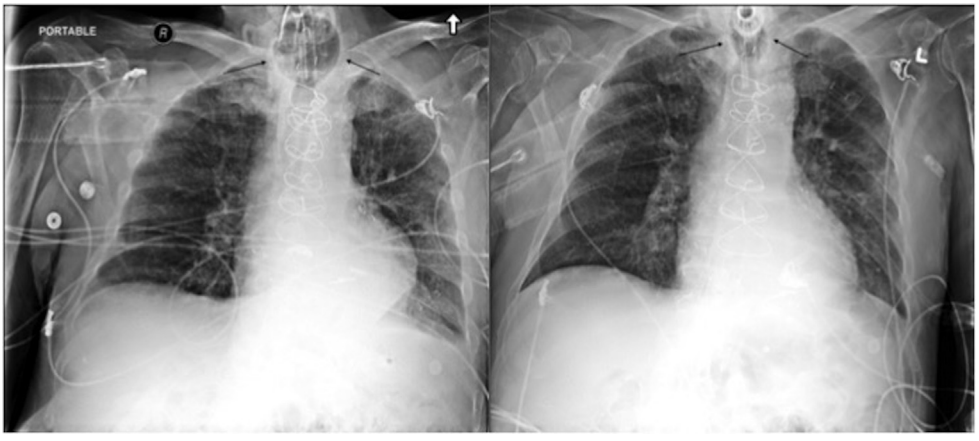

Figure 1. Left: Chest radiograph on admission showing dilated trachea (arrows). Right: Portable chest radiograph showing a dilated but much smaller trachea (arrows) after replacement of tracheostomy with appropriate cuff inflation pressure.

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teams performed bronchoscopy and flexible tracheoscopy, respectively. Tracheal examination revealed a large cavity likely from an overinflated cuff. A new tracheostomy tube was placed, and the cuff was inflated to an appropriate pressure of 30 cm H_2O and provided adequate seal with accurate delivery of tidal volumes (Figure 1; right).

DISCUSSION

Tracheal mucosa blood flow is decreased when inflated cuff pressure is > 30 cm H_2O and eliminated when pressure is more than 50 cm H_2O (2). The recommended pressure is 20–30 cm H_2O for adults in the intensive care unit (3). However, there are no guidelines for the frequency of cuff pressure checks and these are usually institution specific.

REFERENCES

1. Harris R, Joseph A. Acute tracheal rupture related to endotracheal intubation: case report. J Emerg Med 2000;18:35–9.
2. Seegobin RD, van Hasselt GL. Endotracheal cuff pressure and tracheal mucosal blood flow: endoscopic study of effects of four large volume cuffs. Br Med J (Clin Res Ed) 1984;288:965–8.
3. American Thoracic Society, Infectious Diseases Society of America. Guidelines for the management of adults with hospital-acquired, ventilator-associated, and healthcare-associated pneumonia. Am J Respir Crit Care Med 2005;171:388–416.