

An innovative method of dilating tracheal stenosis by using endotracheal tube cuff inflation

Dear Editor,

Tracheal stenosis (TS) is a rare condition with incidence after prolonged mechanical ventilation is 0.2%–20%.^[1] We report a case of TS and subglottic web managed by an innovative method.

A 30-year-old male patient suffered a severe head injury and was tracheostomized after seven days. He was on mechanical ventilation for 29 days and was decannulated after one month. He developed difficulty in breathing one week later which was not associated with dysphagia, odynophagia, or aspiration pneumonitis. Computed tomography (CT) of the neck and thorax showed findings of short segment stenosis seen in the upper trachea ~1.1 cm with a diameter of ~4.4 mm, circumferential mildly enhancing tracheal wall thickening seen at the level of a sternal notch at C7- D1 level. Fiber optic laryngoscopy revealed bilateral mobile vocal cords and subglottic web of ~1 × 1 cm size

The primary surgical team decided to perform bronchoscopy and serial dilatation with traditional rigid dilators for tracheal stenosis followed by cold steel excision of the subglottic web. Following serial tracheal dilatation by the head and neck surgery team with 6.0 mm and 6.5 mm rigid bronchoscopes in succession, oral intubation was attempted with a 6.0 mm cuffed

PVC endotracheal tube (ETT) which was unsuccessful due to inability to pass tube beyond the stenosis. The instinctive action of the anesthesiologist was to make a second attempt to secure the airway using a smaller tube of 5.5 mm internal diameter which was successful. At this point, the author decided to use this same ETT as a dilator and maintain the airway. ETT was deflated and inserted distal to the stenotic trachea and the cuff was refilled with 10 ml of normal saline to inflate it to dilate the stenotic segment. Once inflated, the tube was pulled out to break the remnant subglottic web which could not be excised. This was done three times which caused successful dilatation of the stenotic segment with no trauma or bleeding in the tracheal mucosa [Figure 1]. A repeat CT scan was performed postoperatively to document the successful dilatation and to help in future tube selection. The benefits of using this technique are twofold: Firstly, it reduces manipulation, thereby reducing trauma and edema. Secondly, this technique ensures a definitive airway for the anesthesiologist.



Figure 1: Left-hand image showing subglottic stenosis before dilatation and right-hand image showing dilatation of stenotic segment of subglottic region with no trauma or bleeding in the tracheal mucosa

When encountering a patient with TS, an anaesthesiologist would usually instinctively attempt reintubation with a narrower diameter ETT, but manipulation may compromise ventilation by increasing the risks of airway resistance, intubation failure, trauma, edema, bleeding, or perforation.^[2] However, the use of smaller ETT remains controversial due to the possibility of inadequate oxygen delivery and maintenance of ventilation from increased airway resistance and work of breathing. Despite known difficulties, ventilating patients with subglottic stenosis is possible.^[3]

However, it is possible to dilate tracheal stenosis by intubating with a smaller diameter tube and inflating the cuff with normal saline. This type of intervention is recommended in cases where there is resource limitation, peripheral setup with limited pediatric airway equipment, and airway edema limiting the further instrumentation of the airway.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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References

- Ghiani A, Tsitouras K, Paderewska J, Munker D, Walcher S, Neurohr C, *et al.* Tracheal stenosis in prolonged mechanically ventilated patients: Prevalence, risk factors, and bronchoscopic management. *BMC Pulm Med* 2022;22:24.
- Youn AM, Yoon SH, Park SY. Failed intubation of an unanticipated postintubation tracheal stenosis: A case report. *Korean J Anesthesiol* 2016;69:167-70.
- Hanlon K, Boesch RP, Jacobs I. Subglottic stenosis. *Curr Probl Pediatr Adolesc Health Care* 2018;48:129-35.

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