

Prolonged hoarseness following endotracheal intubation - not so uncommon?

Sir,

Endotracheal intubation with direct laryngoscopy may result in injuries of the airway, which can occur even with optimal patient position and muscle relaxation. Injuries of the airway include mucosal lacerations, submucosal bleed, glottic oedema, recurrent laryngeal nerve damage and arytenoid joint dislocation. Arytenoid dislocation generally presents with persistent hoarseness or dysphagia in adults, or as stridor in children. Because of its non-specific symptoms, diagnosis of the arytenoid dislocation is often delayed.

A 35-year-old male patient, 174 cm in height, weighing 86 kg, who presented with a large mass involving the caecum, was planned for laparotomy. Airway examination revealed an adequate mouth opening, thyromental distance of 8 cm, with a Mallampati Airway Class II. Anaesthesia was induced with thiopentone 5 mg/kg intravenously, and the trachea was intubated after muscle relaxation with succinylcholine 1 mg/kg. Laryngoscopy was performed with Macintosh size 4 blade. Glottis visualised laryngoscopically was noted to be Cormack Lehane Grade II. Trachea was intubated without difficulty with an 8.5 mm internal diameter endotracheal tube, inserted up to 22 cm and secured at the right oral commissure. Cuff pressure was monitored at inflation and hourly thereafter with a cuff pressure gauge and kept below 25 cm of water. The patient was placed intraoperatively on mechanical ventilation. The patient underwent a right hemicolectomy and was extubated uneventfully after surgery, which lasted for 2 h. There was no coughing or straining at intubation, intraoperatively or at extubation.

On the first post-operative day, patient complained of hoarseness of voice which persisted over the next 2 days. Indirect laryngoscopy done at 96 h postoperatively revealed oedematous epiglottis and arytenoids. Fiberoptic laryngoscopy performed with the patient breathing and phonating showed dislocation of the right arytenoid cartilage to an anteromedial position with reduced vocal fold motion [Figure 1]. There was absence of 'jostle

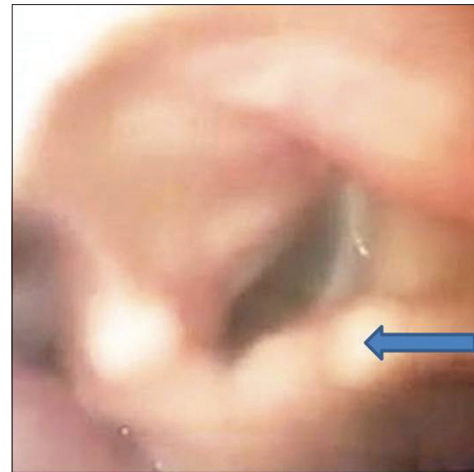


Figure 1: Fiberoptic laryngoscopy showing dislocation of the right arytenoid cartilage to an anteromedial position

sign,' which is the passive medial movement of the affected vocal cord during adduction, which is seen in unilateral recurrent laryngeal nerve palsy. The patient was advised conservative management with vocal cord exercise for his hoarseness. He recovered slowly with improvement in voice quality over a period of 3 months. Repeat fiberoptic laryngoscopy revealed the left arytenoid had compensated for the right arytenoid still displaced.

The incidence of hoarseness after endotracheal intubation varies widely from 14% to 50% but is mostly temporary. In a retrospective study of 3093 patients who had endotracheal intubation during anaesthesia, the incidence of hoarseness was 49% in the immediate post-operative period.^[1] The incidence fell to 29% on day 1, 11% on day 3 and 0.8% on day 7 postoperatively. Injury to the arytenoid is not an uncommon complication of endotracheal intubation. The incidence of arytenoid dislocation varies between 1 in 1000 and 1 in 4000 in various studies.^[1] The most common cause of arytenoid dislocation is intubation trauma, reported as being responsible for between 80 and 87% of arytenoid dislocations.^[2] Increased risk of arytenoid dislocation may occur in patients with laryngomalacia, acromegaly and in those on chronic steroid therapy.

However, an important differential diagnosis is recurrent laryngeal nerve palsy. The incidence of vocal cord palsy after intubation was found to be around 1 in 1300 in a study by Kikura *et al.*^[3] The anterior branch of the recurrent laryngeal nerve runs between cricoid and the thyroid cartilage, and an overinflated cuff in the

subglottic region can injure the nerve by compression between the cuff and thyroid cartilage. Nerve Injury is difficult to anticipate, but can be prevented with simple measures such as choosing the right size of endotracheal tube, positioning the cuff at least 15 mm below vocal cords, monitoring cuff pressure and avoiding excessive stretching of the neck.^[4]

There is difficulty in early differentiation between arytenoid dislocation and recurrent laryngeal nerve palsy; however, regular follow-up laryngoscopy with video-stroboscopy will aid in confirming the diagnosis. Laryngeal electromyography is the investigation of choice, along with helical computed tomography scan, for differentiating the causes for prolonged hoarseness.^[5]

Voice therapy and closed reduction using microlaryngoscopic surgery are modalities for treatment for arytenoid dislocation. Delay in diagnosis and treatment of arytenoid dislocation can lead to vocal fold immobility due to fibrosis of the injured joint. Hence, it is imperative to emphasise that prolonged hoarseness after endotracheal intubation should be investigated thoroughly to reach an early diagnosis, and appropriate management should be instituted at the earliest.

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Conflicts of interest

There are no conflicts of interest.

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