



RESEARCH ARTICLE

REPEATED END OTRACHEAL TUBE CUFF RUPTURE DURING NASAL INTUBATION IN A PATIENT WITH RESTRICTED MOUTH OPENING: A CASE REPORT

¹Sivakumar Elangovan ²Sarathkumar, B. and ³Sugumar, M. and ⁴Arvind Bhalekar

¹Consultant, Department of anaesthesia and critical care, Renai medicity, Ernakulam; ²Assistant professor, Department of critical care medicine, Psg hospital Coimbatore; ³Senior resident, Department of anaesthesia and critical care, AIIMS Delhi; ⁴Associate professor, Department of anaesthesiology, Institute of medical sciences, Banaras Hindu University, Varanasi

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*Corresponding author:

Sivakumar Elangovan Sarathkumar

ABSTRACT

Nasotracheal intubation is frequently required in oral and maxillofacial oncosurgery when trismus precludes conventional oral laryngoscopy. Although generally regarded as a safe route, the nasal cavity can harbor unrecognized anatomical variants — most notably a bony nasal spur or septal deviation — capable of lacerating the endotracheal tube cuff during passage, leading to a persistent air leak and repeated failed intubation attempts. We report a 40-year-old male with carcinoma of the right buccal mucosa and a mouth opening of one fingerbreadth, posted for wide local excision with modified radical neck dissection and pectoralis major myocutaneous (PMMC) flap cover, who underwent awake retrograde nasotracheal intubation. Two consecutive endotracheal tubes developed cuff leaks during nasal passage on the left side. Imaging obtained for surgical staging subsequently revealed a left-sided bony nasal spur with contralateral turbinate hypertrophy. Following failure of a further attempt through the right nostril, the patient ultimately required tracheostomy. This case highlights nasal spur as an important and often occult cause of recurrent cuff rupture during nasal intubation, and underscores the value of proactively reviewing available imaging, or performing simple clinical screening of nasal patency, before committing to a nostril in patients requiring nasal airway access.

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INTRODUCTION

Securing the airway in patients with head and neck malignancy and severely restricted mouth opening remains one of the more demanding scenarios in anesthetic practice. When oral access is impossible, the nasal route — whether via blind nasal, fiberoptic-guided, or retrograde-assisted intubation — is frequently chosen as the default alternative.^{4,5} While nasotracheal intubation is generally well tolerated, it carries risks distinct from oral intubation, including epistaxis, turbinate injury, submucosal dissection, and, less commonly, mechanical injury to the endotracheal tube itself as it traverses the nasal cavity. Cuff rupture during nasal passage is an under-recognized complication that can present as a persistent air leak despite adequate cuff inflation, forcing repeated re-intubation attempts in an already compromised airway, as documented in several prior reports.^{1,2,3} We describe a case of repeated cuff rupture during awake retrograde nasotracheal intubation in a patient with trismus secondary to oral malignancy, ultimately attributable to an unrecognized bony nasal spur, and review the relevant literature on this complication and its prevention.

CASE PRESENTATION

A 40-year-old male with carcinoma of the right buccal mucosa and a mouth opening restricted to one fingerbreadth (ASA physical status II) was posted for wide local excision, modified radical neck dissection, and PMMC flap cover. Neck movements were adequate and there was no palpable neck mass. Nasal patency was assessed by history and was reported to be equal on both sides. In view of the trismus, awake retrograde nasotracheal intubation was planned. The airway was prepared with nebulized lignocaine and topical xylometazoline nasal drops, and injection glycopyrrolate 0.2 mg was administered intramuscularly as an antisialagogue. Bilateral superior laryngeal nerve blocks were performed with 1.5 ml of 2% lignocaine on each side, and 2 ml of 4% lignocaine was instilled intratracheally for topicalization. The cricothyroid membrane was punctured with a 16-gauge needle, and a percutaneous nephrolithotomy (PCNL) catheter was advanced into the trachea through the needle using the Seldinger technique. A PCNL guide wire was passed retrograde through the catheter and was retrieved through the left nostril. A 15Fr bougie was then railroaded over the guide wire, with the wire kept taut, until resistance was felt at the

cricothyroid puncture site. A 7 mm PVC endotracheal tube was then advanced smoothly over the lubricated bougie. The bougie was withdrawn, and tracheal placement was confirmed by capnography with the guide wire still in situ. Before proceeding to general anesthesia, the pilot balloon was checked, and a cuff leak was identified. The endotracheal tube was replaced with a second tube using the same retrograde technique, and tracheal position was again confirmed by capnography — however, the cuff leak recurred. As the patient was scheduled for a pre-surgical staging MRI, this was performed with the airway secured; the MRI incidentally demonstrated a bony nasal spur on the left side, with hypertrophy of the right-sided turbinate.

with fiberoptic guidance, to secure the airway in oral cancer patients with severe trismus.⁴ However, as illustrated in this case, retrograde guidance directs the tube toward the glottis but does not itself protect the endotracheal cuff from mechanical injury during transit through the nasal cavity — the cuff still has to negotiate whatever anatomy the nostril presents. Several published case reports describe cuff tears occurring during nasotracheal intubation from mechanical causes within the nasal cavity, reinforcing the general principle that a persistent, unexplained cuff leak during nasal intubation should prompt a search for such a cause rather than being attributed to a tube manufacturing defect.^{1,2} Closer to the present case, a bony nasal spur has also been reported as a cause of recurrent cuff rupture during nasal intubation in a patient with an anticipated difficult

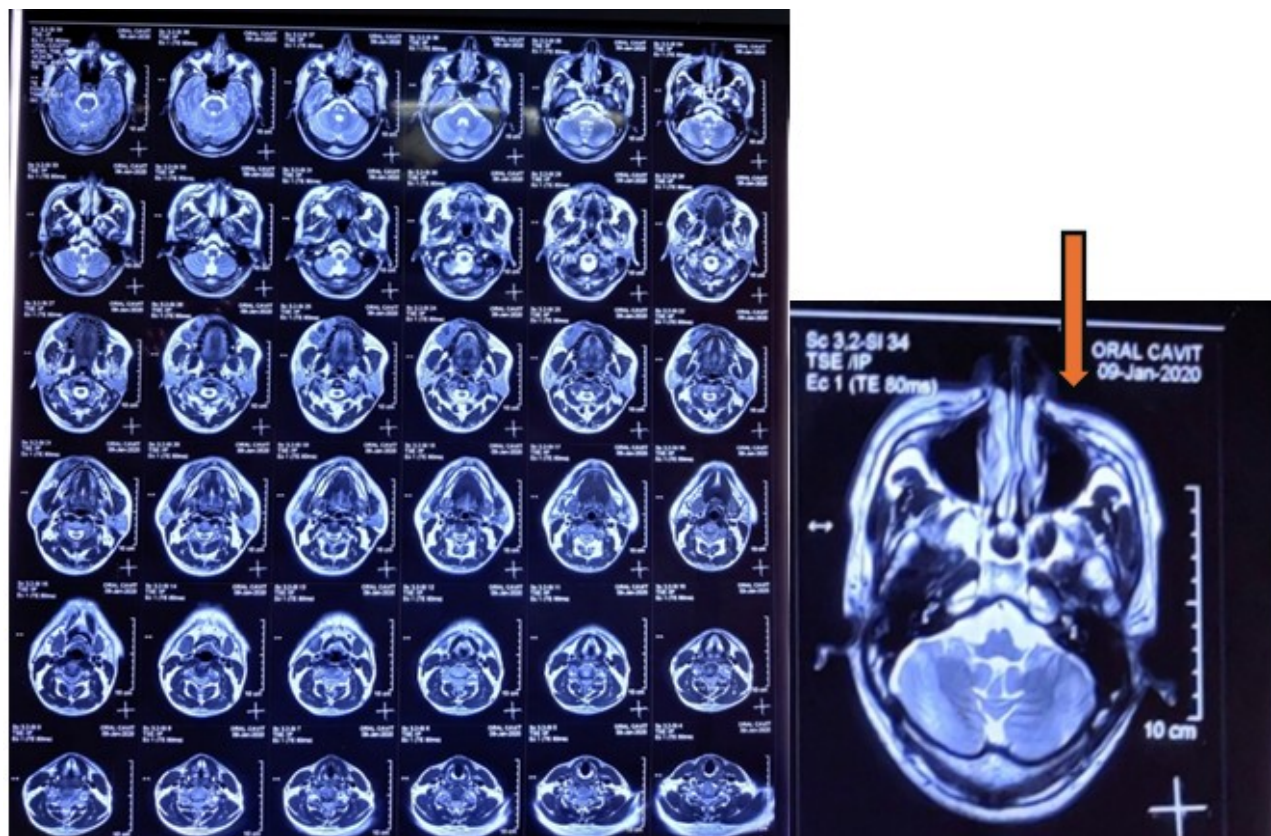


Figure 1. Imaging demonstrating a left-sided bony nasal spur, with hypertrophy of the right-sided turbinate

As the patient remained awake and cooperative, the endotracheal tube was removed, and an attempt was made to pass the guide wire through the right nostril; this was unsuccessful. A blind nasal intubation attempt was then made with a 6.5 mm PVC endotracheal tube, and correct tracheal placement was confirmed by capnography. Because the patient's severely restricted mouth opening precluded any laryngoscopy rescue attempt, and further nasal access had been exhausted, the decision was made to proceed to tracheostomy to secure a definitive airway.

DISCUSSION

Nasotracheal intubation is a common technique in oral and maxillofacial surgery, particularly when trismus or a large intraoral mass precludes direct or video laryngoscopy. Retrograde intubation, as used in this case, was first described several decades ago as an alternative to surgical airway access when glottic visualization is difficult or unreliable.⁵ It has previously been used successfully, including in combination

airway and restricted mouth opening, where failure of further nasal attempts ultimately necessitated conversion to submental intubation — a management trajectory that parallels the eventual need for tracheostomy in our patient.³ In our patient, the left-sided nasal spur responsible for the repeated cuff tears was identified only after two failed tube passages, on an MRI performed for oncological staging rather than dedicated airway assessment. Where cross-sectional imaging is unavailable or has not yet been performed, simple clinical screening of nasal patency — going beyond a history of unilateral nasal breathing to include anterior rhinoscopy, nasal speculum examination, or gentle palpation — has been suggested as a pragmatic bedside step to identify the more favorable nostril before committing to nasal instrumentation.³ The management principles that emerge from this body of literature, and that were reflected in the handling of this case, are threefold. First, a persistent cuff leak on nasal intubation should not be managed by repeated blind attempts through the same or an unassessed contralateral nostril.¹ Second, a spare tube — ideally of a size appropriate for repeat nasal passage — should be immediately available

once a leak is suspected.² Third, once nasal access has genuinely failed bilaterally in a patient whose mouth opening precludes laryngoscopy rescue, escalation to an alternative definitive airway, such as submental intubation or tracheostomy, should be pursued promptly rather than after further nasal attempts, in order to limit mucosal trauma, bleeding, and distress to an awake patient.³ This case adds to the existing literature by describing recurrent cuff rupture occurring specifically during awake retrograde nasal intubation, a technique combination not previously highlighted in this context, and by demonstrating how staging imaging obtained for oncological purposes can incidentally reveal the underlying anatomical cause when actively reviewed.

CONCLUSION

A bony nasal spur or significant septal deviation should be considered whenever a persistent, unexplained cuff leak occurs during nasotracheal intubation. Available cross-sectional imaging should be proactively reviewed for nasal septal pathology before nasal intubation is attempted, and where imaging is unavailable, simple clinical assessment of nasal patency should supplement history alone. In patients with severely restricted mouth opening, a low threshold to abandon further nasal attempts in favor of an alternative definitive airway — submental intubation or tracheostomy — is prudent once cuff injury recurs, to avoid repeated trauma, bleeding, and a cannot-intubate situation.

DECLARATION

Consent: Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Conflict of interest: The authors declare no conflict of interest.

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REFERENCES

1. Mahajan R, Nazir R, Gulati S, Rasool A. Another cause of damage to tracheal tube cuff during nasotracheal intubation. *J Clin Anesth.* 2016;31:111–112.
2. Green MS, Hoffman CR. An unusual cause of nasotracheal tube cuff equipment failure. *J Clin Anesth.* 2012;24:600–601.
3. Kalaria N, Goyal S, Sethi P, Bhatia P. Repeated cuff rupture with nasal intubation: what we learn!!! *Indian J Anaesth.* 2019;63:680–682.
4. Das S, Mandal MC, Gharami BB, Bose P. Fiberoptic aided retrograde intubation in an oral cancer patient. *Indian J Anaesth.* 2011;55(3):287–288.
5. Butler FS, Cirillo AA. Retrograde tracheal intubation. *Anesth Analg.* 1960;39:333–338.
