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Case Report

Iatrogenic hypoglossal nerve palsy, a rare complication post suspension laryngoscopy

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الملخص

العصب تحت اللسان هو عصب حركي نقي، ينشأ كعصب مقترن من نواته في النخاع، ويخرج من قاعدة الجمجمة عبر القناة تحت اللسان وينزل من الرقبة ليعصب عضلات اللسان. شلل العصب تحت اللسان علاجي المنشأ غير شائع، ولكن تم الإبلاغ عن حالات خاصة بعد إدارة مجرى الهواء في التخدير العام وتنظير الحنجرة التعليقي. نقدم هنا حالة شلل العصب تحت اللسان علاجي المنشأ حصلت بعد تنظير الحنجرة التعليقي، وتمت إدارتها بشكل تحفظي مع الشفاء التام بعد ثلاثة أشهر. نناقش أهمية أخذ الموافقة على تنظير الحنجرة التعليقي، والطرق الممكنة لمنع هذه المضاعفات غير الشائعة.

الكلمات المفتاحية: شلل العصب تحت اللسان؛ علاجي المنشأ؛ جراحة الحنجرة الدقيقة؛ تنظير الحنجرة التعليقي؛ تنظير الحنجرة المباشر

Abstract

The hypoglossal nerve (CN XII) is a pure motor nerve arising as a paired nerve from its nuclei in the medulla, exiting the skull base via the hypoglossal canal, and descending the neck to innervate the muscles of the tongue. Iatrogenic hypoglossal nerve palsy is uncommon, but cases have been reported, especially after airway management in general anaesthesia and suspension laryngoscopy. We report a case of iatrogenic hypoglossal nerve palsy post-suspension laryngoscopy, which was managed conservatively with full recovery after three months. We discuss the importance of minimal consent for suspension laryngoscopy and possible methods to prevent this uncommon yet unpleasant complication.

Keywords: Direct laryngoscopy; Hypoglossal nerve palsy; Iatrogenic; Microlaryngeal surgery; Suspension laryngoscopy

Introduction

Iatrogenic hypoglossal nerve palsy is a rare complication of direct laryngoscopy, with reported incidence ranging between 0.36% and 2.7%.[1,2] Direct laryngoscopy (DL) or suspension laryngoscopy (SL) is a common procedure in ENT practice, particularly in the field of laryngology. During the procedure, a rigid direct laryngoscope is inserted orally, compressing the tongue and tongue base. The patient's neck is also extended to provide a good field of vision.[3] SL provides the surgeon with the ease and benefit of bimanual hand usage, especially during microlaryngeal surgery.[4] Patients subjected to DL or SL should be properly counselled regarding the procedure, risks, and possible complications, including uncommon complications such as hypoglossal nerve palsy. ENT surgeons, especially junior specialists, must be aware of such complications and employ techniques to reduce such risks.

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Case summary

Our patient is a 70-year-old gentleman with underlying hypertension and dyslipidemia, diagnosed with glottic squamous cell carcinoma (T1N0M0). He was subjected to DL and laser cordectomy under general anaesthesia to treat his early-stage glottic cancer. During the procedure, he was intubated with a microlaryngeal endotracheal tube (MLT) size 5.0 with no documented difficulties by our anaesthesiology team.

DL was performed with a Lindholm operating laryngoscope and a fulcrum-type suspension system. The total documented operative time was 125 minutes. Intraoperatively, there was an irregular mass involving the left anterior (1/3) to the middle (2/3) of the true vocal cords, sparing the anterior commissure. Other laryngeal subsites were not involved. Type II subligamental cordectomy was performed with a CO_2 laser and the patient was extubated well.

During the post-operative review, the patient complained of difficulties articulating, with slurred speech. The patient was noted to have his tongue deviated to the right (Figure 1). There were no tongue fasciculations and tongue swelling. Other clinical examinations were unremarkable. He was diagnosed with right hypoglossal nerve paresis post direct laryngoscopy, was treated conservatively with IV Dexamethasone 8 mg tds for three days, and subsequently discharged with oral Prednisolone 30 mg daily for two weeks and Tab Methylcobalamin 500 mcg tds for one month. The patient subsequently regained full motion of his tongue at approximately three months postoperative period.

Discussion

The hypoglossal nerve is a paired cranial nerve, arising from its nuclei in the medulla, which exits the skull base via the hypoglossal canal and passes deep into the internal jugular vein and superficial to the carotid arteries, mainly crossing superior to the carotid bifurcation.[5] The nerve then passes above the hyoid bone, goes in between the mylohyoid and hyoglossus muscles, and finally supplies all the tongue muscles except the palatoglossus.[6]

Although a rare occurrence, iatrogenic injury of the hypoglossal nerve in relation to airway management during general anaesthesia[7,8] and otorhinolaryngology procedures, such as SL for laryngeal microsurgery,[1–4] has been described. Ayako et al. reviewed 550 patients who underwent laryngeal microsurgery. Overall, 16.9% of the patients complained of tongue-related complications, with 0.4% (n = 2) developing hypoglossal nerve paralysis.[3] Previous studies have reported the incidence rate of hypoglossal neuropathy ranging from 0.36% to 2.7%.[1,2]

Hypoglossal nerve palsy post SL or intubation injuries is a lower motor neuron lesion and thus causes ipsilateral paresis with a deviation of the tongue towards the side of the lesion. It is often neuropraxic but can also be due to axonotmesis.[9] This has been postulated to be caused by direct pressure of the laryngoscope blade at the tongue base, resulting in soft tissue compression against the hyoid bone, and also due to neck hyperextension during the procedure, which may stretch the hypoglossal nerve on the transverse process of C1.[2,4,7] Continued compression or stretching of the nerve may lead to Schwann cell damage and demyelination or may also cause axonal loss with Wallerian degeneration.[9]

Hypoglossal nerve neuropathy and other tongue-related complications after SL are classified as minor complications,[2,4] and symptoms are usually self-limiting.[3,4,7] A majority of the patients can be treated conservatively, and recovery time ranges from three weeks to three months.[3] Although minor, it is important for ENT surgeons to educate and counsel patients preoperatively during consent-taking, as this complication could be a cause of discomfort postoperatively.[3,4] Several preventive techniques have also been suggested, such as to not tighten the laryngoscopy excessively at the time of laryngeal deployment to avoid tongue base over compression.[3] Meanwhile, for longer procedures, Larner et al.[10] suggested that suspension time should be limited to 30 consecutive minutes with relief of suspension for approximately three minutes, which subsequently leads to an overall decrease in the incidence of complications, as this was thought to limit both stretching and compression of the nerve.

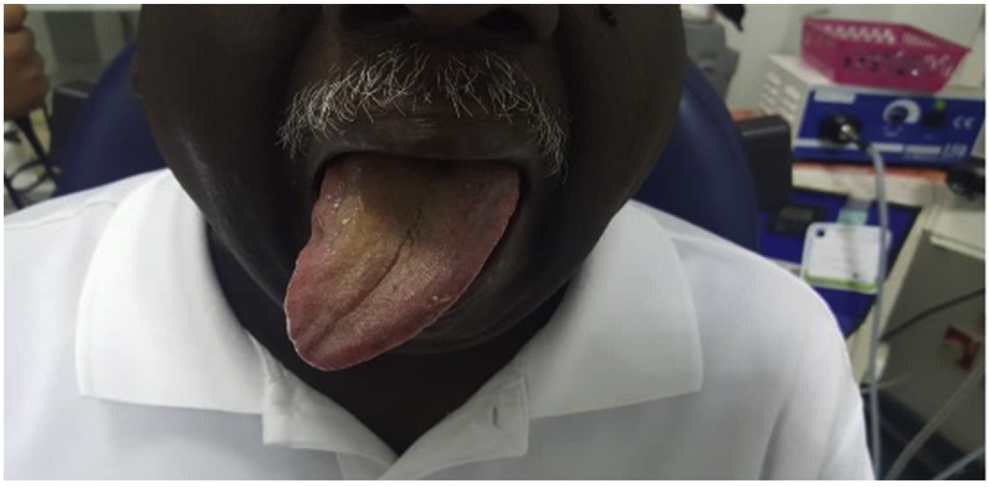

Figure 1: Tongue deviated to the right suggestive of right hypoglossal nerve palsy.

Conclusion

Although hypoglossal nerve palsy post-suspension laryngoscopy is an uncommon postoperative complication, it still causes a considerable amount of discomfort to patients, especially regarding articulation difficulties. This should be carefully explained to them preoperatively and considered as part of the minimum required consent for all patients undergoing laryngoscopy procedures. Surgeons should also be aware of different techniques to reduce the risk of this unpleasant complication.

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Conflict of interest

The authors have no conflict of interest to declare.

Ethical approval

No personal details or identifying information is included in the paper. Consent was taken from the patient for the use of the clinical image and for the case to be written and published. Ethics approval was not obtained from our Clinical Research Centre as it was not required for a case report.

Authors contributions

JMY and NK collected necessary case information and JMY wrote the original and final draft. KASAD provided the initial idea for the case report and its aims. MA provided the critical review and editing of the case report. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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