Case Report

Easy Endotracheal Intubation of a Patient Suffering from Both Cushing’s and Nelson’s Syndromes Predicted by the Upper Lip Bite Test Despite a Mallampati Class 4 Airway

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A 31-yr-old woman with concurrent Cushing’s and Nelson’s syndromes was scheduled for transsphenoidal hypophysectomy. The patient had generalized edema, morbid obesity, and a history of sleep apnea. Her Mallampati assessment was Class 4, suggesting very difficult intubation, but the upper lip bite test predicted easy intubation. After rapid sequence induction, there was a Class 1 view on laryngoscopy, and intubation was accomplished easily.

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Cushing’s Syndrome is caused by excessive endogenous production of corticosteroids or exogenous steroid administration. Most cases of endogenous hypercortisolism are caused by an adrenocorticotrophin-secreting pituitary microadenoma, in which case the condition is called Cushing’s disease (1). “Nelson’s syndrome” is the name given to the hyperpigmentation, adrenocorticotropic hormone excess, and pituitary expansion that may follow bilateral adrenalectomy for Cushing’s syndrome because of a pituitary adenoma. At present, there are no data to suggest that Cushing’s disease is an independent risk factor for a difficult intubation. However, it is associated with characteristics common in such intubations, such as obstructive sleep apnea (2) and obesity (3). We describe a case of combined Cushing’s syndrome and Nelson’s syndrome in which the conventional Mallampati classification (4) was poorly predictive, and the only test, which correctly predicted the airway class before laryngoscopy, was the upper lip bite test (5).

CASE REPORT

A 31-yr-old woman developed generalized edema, excessive weight gain, hyperpigmentation, hirsutism, hypertension, and oligomenorrhea after an uneventful cesarean delivery 10 yr previously. She underwent an open bilateral adrenalectomy 2 yr later after being diagnosed with Cushing’s syndrome. A pathological report of the adrenals had revealed diffuse adrenal hyperplasia. Hormonal replacement therapy was started postoperatively and followed with periodic checks of hormonal levels. Because her obesity and hyperpigmentation continued to worsen, a transnasal hypophysectomy was planned to remove a pituitary adenoma.

The patient reported a positive history of sleep apnea and grunting respiration during sleep. The patient weighed 106 kg and had a height of 156 cm. On examination, she had centripetal obesity and the classic buffalo hump (Fig. 1), broad purple striae on the abdomen, pulp atrophy, proximal muscle weakness, and generalized increased pigmentation of the skin, including the lips. Laboratory tests showed adrenocorticotropic hormone 450 pg/mL (9–52 pg/mL) and serum cortisol 11.2 nmol/L (140–690 nmol/L).

Evaluation of the airway before operation revealed an interincisor distance of 4 cm.

Sternal and thyromental distances were impossible to measure owing to a huge lump encircling the neck and totally obscuring the entire anatomical landmarks anterior to the neck (Figs. 1–3). Her maximum range of head and neck movement measured as described by Wilson et al. (6) was 90°. Mallampati classification (4) depicted a Class 4 status (Fig. 2), suggesting a difficult intubation. The upper lip bite test showed a Class 1 status (Fig. 3) suggesting an easy intubation.

Laryngeal mask airway, different laryngoscopy blades, video glidescope, and a flexible fiberoptic scope were available in the event of a difficult airway. After preinduction doses of fentanyl 2 μg/kg and midazolam 3 mg IV, a rapid sequence induction was initiated with thiopental sodium 5 mg/kg and succinylcholine 1.5 mg/kg. On laryngoscopy, the Cormack and Lehane grading (7) was 1 as predicted by the upper lip bite test classification (5). The patient was easily intubated. Her surgical and perioperative course were uneventful.

DISCUSSION

This patient had many factors predictive of difficult intubation. On opening the mouth, only the hard palate could be seen (Mallampati Class 4) (4). The interincisor distance was only 4 cm. The patient weighed 108 kg, and was considered at risk for difficult intubation (6,8). The American Society of Anesthesiologists practice standard...
for difficult airway (9) would have recommended intubation before general anesthesia.

The Mallampati test has been reported to have a sensitivity of 67.9%, 56.5%, and 42% (10–12), resulting in many patients having an unpredicted difficult intubation based on this test. Tse et al. (13) found a sensitivity of 66% for the Mallampati Class 3 test, and considered it useful when its results were negative.

We relied on the accuracy of the upper lip bite test class. Khan et al. (5) found a greater specificity, and positive predictive value, and accuracy with the upper lip bite test than with the modified Mallampati classification. These findings were subsequently confirmed by Eberhart et al. (14). However, Eberhart et al. also reported that the sensitivity of the upper lip bite test is low. As a result, failure of the upper lip bite test does not reliably indicate a difficult intubation (low sensitivity), but a successful upper lip bite test is highly predictive of an easy intubation (high specificity). Thus, an upper lip bite test class of 1 coupled with good neck extension and flexion (6) of 90° were sufficient criteria for us to predict with confidence that the intubation would be easy and thus proceeded with the rapid sequence protocol.

In our view, when the airway is questionable it is best to assess the risk of difficult intubation based on two tests such as the upper lip bite test and the modified Mallampati test. Even though the upper lip bite test performed well in this case, we cannot conclude that it will always do so in such challenging patients. As a result, we had multiple alternatives immediately available for managing this patient’s airway. Additionally, the most prudent approach would probably have been an awake fiberoptic intubation.

REFERENCES