

RECURRENT POSTOPERATIVE ASPIRATION FOLLOWING JUGULAR FORAMEN TUMOR RESECTION

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Abstract

We report a 38 year old male patient who underwent a craniotomy for jugular foramen tumor resection. In the postoperative care unit, the patient developed aspiration accompanied with oxyhemoglobin desaturation. Subsequently, he had several episodes of recurrent aspiration which were attributed to cranial nerves (IX, X) palsy as a complication of the surgery at the jugular foramen. It is suggested that aspiration prophylactic measures should be taken and early assessment of lower cranial nerves function should be done prior to tracheal extubation to decrease post-operative aspiration in patients undergoing base of skull surgery.

Introduction

Patients undergoing base of the skull surgery can develop post-operative neurological complications including lower CNP which increases the risk of aspiration^{1,2}. Aspiration prophylactic measures and early detection of neurological deficits are the key points in management of patients undergoing base of skull surgery.

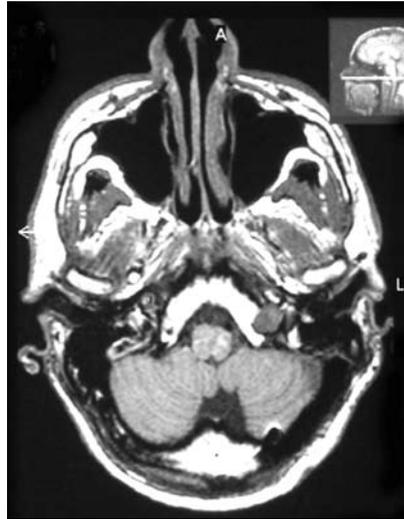
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Case report

A 38 year old male patient, complaining of tinnitus and dizziness underwent a left jugular foramen Schwannoma resection (Fig. 1).

Fig. 1
T1 axial MRI showing left Jugular
foramen tumor



He was NPO for 10 hours. Anesthesia was induced with lidocaine 80 mg, fentanyl 100 µg, propofol 160 mg and rocuronium 50 mg. Anesthesia was maintained with isoflurane 0.6%-0.8%, nitrous oxide 60%, O₂ 40% and an infusion of fentanyl at a rate of 1-2 µg/kg/hr. An oro-gastric tube was inserted and left to drain by gravity. Muscle relaxants were not used to allow muscle response to continuous facial nerve stimulation. Fentanyl and isoflurane were discontinued two hours before the end of surgery and substituted with propofol infusion at rate of 150-200 µg/kg/min. The total anesthesia time was 8 hours.

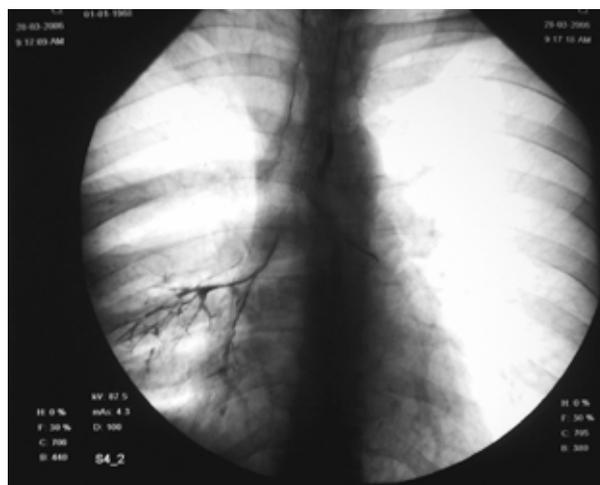
On emergence, the patient was awake, responsive to verbal command and breathing spontaneously. According to the surgeon there was no contraindication to tracheal extubation. Subsequently, the trachea was extubated in the operating room and the patient was transferred to the PACU.

While in the PACU, the patient complained of nausea and retching that was treated with 4 mg IV zofran. Few minutes later, the patient's oxyhemoglobin saturation (SaO_2) suddenly started dropping down to 80% despite supplemental oxygen. Arterial blood gas analysis showed: $\text{PaO}_2 = 55.8$ mmHg $\text{PaCO}_2 = 45$ mmHg $\text{SaO}_2 = 78\%$. The trachea was re-intubated and the lungs were ventilated with oxygen 100%. Bilius secretions were present by suctioning the ET tube. A chest radiograph (CXR) was taken immediately that showed to be normal. However, twelve hours later, the CXR was repeated and showed right lower lobe infiltration. The patient's pulmonary status was stabilized overnight and the trachea was extubated the next day.

On the second post-operative day, a full neurological examination showed a decrease in gag reflex with unilateral vocal cords consistent with lower CNP of IX, X. In addition, the patient complained of dysphagia and hoarseness. He was started on soft diet with aspiration precaution. However, he choked and aspirated again. A radio-contrast study showed swallowing abnormality with aspiration of the contrast material (Fig. 2).

The patient was kept nil by mouth and a naso-duodenal tube was inserted for feeding. Ten days later, the patient gradually recovered his swallowing function and was discharged from the hospital without sequels.

Fig. 2
Radio-contrast
study showing right
upper and lower
lobe aspiration
of the contrast
material



Discussion

In surgical literature there are two reviews mentioning the prophylaxis of post-operative acid aspiration in patients undergoing base of skull surgery^{1,2}. In the first review of 102 patients undergoing jugular foramen tumor resection, 10 patients (9.9%) developed post-operative lower cranial nerves palsy and 2 out of these patients (1.9%) died because of aspiration pneumonitis and septicemia². The authors recommend several prevention techniques to decrease post-operative aspiration resulting from lower CNP. They suggest leaving the naso-gastric tube after tracheal extubation until the patient regains his swallowing reflexes. They also recommend delaying tracheal extubation after careful assessment of the function of the lower cranial nerves with early tracheostomy if aspiration persists².

In second review of base of skull surgery, the authors recommend pre-medication of the patients with proton pump inhibitors (PPI's) to decrease acid-related complications³. They also considered the base of skull surgery to be associated with high incidence of post-operative nausea and vomiting which increases the risk of aspiration following tracheal extubation, hence, they advise the administration of 4 to 8 mg ondansetron 30 to 60 minutes before emergence^{1,4}. Furthermore, they recommend the infusion of high dose propofol to reduce the incidence of post-operative nausea and vomiting and subsequent aspiration^{1,5}.

In our case, several precautions were taken to avoid post-operative complications. During anesthesia maintenance, isoflurane and fentanyl were substituted with propofol infusion two hours before the end of surgery. This allowed rapid emergence from anesthesia and fully awake tracheal extubation for airway protection and early neurological assessment. In addition, before tracheal extubation, adequate suctioning of the stomach was performed to avoid aspiration. However, our major management deficits were the early tracheal extubation prior to proper assessment of the function of lower cranial nerves and the inadequate prophylactic measures against post-operative aspiration. Indeed, the tracheal extubation is the most critical part of the management of these patients. It should always be delayed until the function of the lower cranial nerves is adequately

assessed. This can be done either by manipulating the endo-tracheal tube to induce coughing or by stimulating the oro-pharynx to elicit gag reflex. Remifentanyl, a short acting opioid, can be used as a sole analgesic drug intraoperatively and can be kept infused at low dose (0.01-0.05 mcg/kg/min) at the end of the case for early neurological assessment before tracheal extubation.

In conclusion, jugular foramen tumor resection can be complicated with post-operative cranial nerve palsy and aspiration pneumonitis. The key points in the management of base of skull surgery are the proper establishment of pre-operative aspiration prophylaxis and the delay of tracheal extubation until a careful assessment of the function of lower cranial nerves be done.

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