

Transient palsy of peripheral cranial nerves following open heart surgery

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ABSTRACT

A 32-year-old man developed hoarseness of voice, inability to swallow and restricted movement of the tongue after open heart surgery. Peripheral injury of the cranial nerves IX, X and XII was suspected, and it was thought that the duration of the surgery together with the endotracheal tube cuff and transoesophageal echocardiography probe pressure, as well as the head and neck position might have been the causes of this complication.

Keywords: cranial nerve palsy, glossopharyngeal nerve, hypoglossal nerve, superior laryngeal nerve transoesophageal echocardiography probe, paralysis.

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INTRODUCTION

Peripheral injury of the cranial nerves is a rare complication after open heart surgery⁽¹⁻³⁾. Airway instrumentation and manipulations^(1,2,4,5), transoesophageal echocardiography (TEE) probe insertion and monitoring⁽⁶⁾ have all been previously implicated as its cause. We report the occurrence of unilateral glossopharyngeal nerve, superior laryngeal nerve and hypoglossal nerve palsy following open heart surgery for aortic and mitral valve replacement.

CASE REPORT

A 32-year-old man, weighing 70 kg, presented to the cardiovascular surgery department with rheumatic heart disease, and was scheduled for aortic and mitral valve replacement surgery. He had no other medical problem other than his cardiac complaints which included dyspnoea, orthopnea and restriction of effort (NYHA Class II). The Mallampati classification for the patient's airway was class I and the mouth opening was normal. He was a non smoker. Electrocardiography (ECG) showed atrial flutter. The patient was premedicated with 10 mg oral diazepam the night before surgery and 7.5 mg intramuscular morphine 30 minutes before surgery.

Anaesthesia was induced with 7 mg midazolam, 700 µg fentanyl, 8 mg pancuronium and 100 mg lignocaine. Endotracheal intubation was made easily with direct laryngoscopy using a size 8 low pressure cuffed endotracheal tube. The internal jugular vein was cannulated from the right side, using the superior approach, without any complication. The TEE probe was then inserted and was left in place throughout the operation for further evaluation. Anaesthesia was maintained with 1 MAC sevoflurane in 50% oxygen, 50% air, 250 (g fentanyl and 2 mg pancuronium bromide. The surgery lasted five hours, the cross-clamping time was 86 minutes, and the cardiopulmonary bypass time was 104 minutes. The procedure was uneventful and there was no complication related to surgery or anaesthesia. The patient's atrial flutter remained postoperatively. The blood pressure and oxygen saturation showed no significant change throughout the operation.

The patient was admitted to the intensive care unit following surgery and was extubated uneventfully 14 hours later. The patient complained of hoarse voice and had difficulty swallowing. The throat was red and oedematous on examination. Culture of the throat showed normal bacterial flora. His gagging reflex was weak on the left and the movement of the tongue was restricted, with the tongue being deviated to the right inside the mouth and to the left outside (Figs. 1 and 2). He had loss of taste on the posterior one-third of the tongue and the soft palate was motionless on the left. There was no sensorial deficiency in the mouth or the tongue, and the evaluation of the cerebellum was normal. Radiographs of the head and neck showed no significant abnormality. Laryngeal evaluation with indirect laryngoscope showed that the left vocal cord had lost its tonus and was closer to midline. Contrast-enhanced cranial CT and the magnetic resonance imaging showed normal brain tissue.

The patient was discharged from the intensive care unit 48 hours later after his haemodynamic stability was ensured. The tongue movement partially improved spontaneously within 72 hours

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Fig. 1 Photograph taken during the first hour post-operation shows that the tongue is deviated rightward inside the mouth.

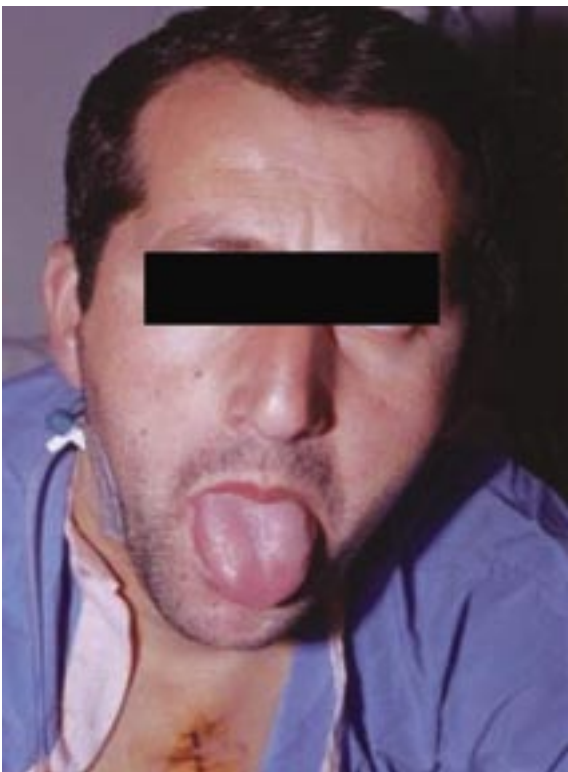


Fig. 2 Photograph taken during the first hour post-operation shows that the tongue is deviated leftward outside the mouth.



Fig. 3 Photograph taken 72 hours after extubation shows that the tongue is slightly deviated rightward inside the mouth, indicating improvement. Inside the red circle, the soft palate on the left is slightly lower than the right.

he received total parenteral nutrition for ten days. A percutaneous enteral gastrostomy was then opened, and he was fed through his gastrostomy for two months. The patient's mood was negatively affected from this situation, and this resulted in depression. Consultants from the psychiatry department started him on 50 mg sertralin, a selective serotonin re-uptake inhibitor. The patient was discharged on the 24th day with only cardiac medication (acetylsalicylic acid 300 mg, digoxin 0.25 mg). Three months later, when the patient presented to our hospital for his routine check-up, the deviation on the tongue, the swallowing difficulty and the loss of taste had been completely restored, and the hoarseness had faded.

DISCUSSION

Peripheral injury of the cranial nerves after open heart surgery is a rarely-reported complication. The most commonly-injured cranial nerves are reported to be the superior laryngeal nerve and hypoglossal nerve^(2,3,5). There are several situations that can be related to this complication. Direct vocal cord damage or palsy due to a traumatic endotracheal intubation, trauma by compression of recurrent laryngeal nerve or its anterior branch at the tracheoesophageal groove by an inappropriately-sized endotracheal tube cuff, laryngeal mask insertion, traction of the oesophagus,

after the operation (Figs. 3 and 4), but his other complaints remained. Because the patient could not be fed orally due to the swallowing inability,



Fig. 4 Photograph taken 72 hours after extubation shows that the tongue is slightly deviated leftward outside the mouth, indicating improvement.

faulty nasogastric tube insertion, central venous cannulation, median sternotomy and/or sternal traction pulling laterally on both subclavian arteries, direct manipulation and retraction of the heart during open heart procedures and hypothermic injury with ice slush, are some of the accepted causes.

In our case, the hoarseness, vocal cord and soft palate paralysis were due to the injury of superior laryngeal nerve; swallowing inability, the loss of taste and gag reflex were due to the injury of glossopharyngeal nerve at the ramus pharyngeus site, and the restricted movement of the tongue was due to injury of the hypoglossal nerve. The injury in the cranial nerves seemed to be located at the neck. The long duration of the surgery together with the endotracheal tube cuff and the pressure of the TEE

probe, and probably, the head and neck position, were responsible for this case. Kawahito et al also pointed out that the duration of surgery, anaesthesia and cardiopulmonary bypass were significantly longer in patients with nerve palsy than those without it⁽⁶⁾. We initially suspected the cause to be the internal jugular vein catheterisation because of the location of all the three nerves right behind the angle of mandible as they leave the cranium, but as the catheter was on the right, while the injury site was on the left, this possibility was ruled out.

According to our investigations, this is the first case report of peripheral injury of three cranial nerves simultaneously following open heart surgery. This rare complication caused great distress on our patient and lowered his postoperative quality of life. In this setting, although complications such as embolisation and global ischaemia could not be easily avoided in open heart surgery, other complications could be minimised through careful and smooth endotracheal intubation, avoiding the long-term extension of the neck, keeping the head in a neutral position, careful catheterisation of the internal jugular vein (because of its close proximity to the nerves) and using the middle approach than the superior, smooth and careful insertion of the TEE probe, avoiding hypoxia and hypotension, weaning the patient as fast as possible, and close monitoring of the cuff pressure. In this setting, it is important to maintain the patient's quality of life in such transient conditions.

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