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Case Report

Awake Fibreoptic Intubation for Forearm Injury in a Patient with Occipito-Cervical Fixator

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Abstract

A 23-year-old male patient with occipitocervical fixator was scheduled for surgery due to injury to the right forearm. The patient's thyromental distance was 5 cm, mouth opening grade II, sternomental distance 10 cm and Mallampati score 4. Loss of extension and rotation movements of the head was assessed as difficult intubation criteria. Anaesthetic procedures are almost always difficult in patients with occipitocervical fixation; the limited cervical extension complicated both intubation and ventilation. In this report, application of general anaesthesia using awake fibreoptic bronchoscopic intubation (FOB) is described. After routine monitoring of vital signs and premedication, hypopharyngeal topical anaesthesia was accomplished by instilling 10% lidocaine spray twice via the appropriate nostril. Superior laryngeal nerve block was performed with local anaesthetic infiltration of tissues 1 cm below the greater horns of the hyoid bone. Lingual and pharyngeal branches of the glossopharyngeal nerve were blocked. Transtracheal block was performed. Following completion of local anaesthesia, the patient was intubated using the awake FOB technique, on 5 L min^{-1} of 100% O_2. After muscle relaxation, the patient underwent a microsurgical operation to repair eight tendons, one artery, and one nerve. Surgery lasted for 5 hours. When the extubation criteria were met, the patient was extubated. In cases of occipitocervical fixation, which causes severe limitation of neck movements, the use of awake fibreoptic intubation should be considered.

Key Words: Occipitocervical fixation, fibreoptic bronchoscope, awake intubation, difficult intubation, loss of extension of neck

Introduction

Occipitocervical fixation is one of the surgical approaches to acute, unstable odontoid fractures (1). Although posterior fixation has the advantage of high fusion rate, loss of head rotation is the major disadvantage, which affects 50% of the patients (2). The patients who underwent occipitocervical fixation suffer from limited or complete loss of neck movements. As these patients meet the criteria for difficult intubation including high Mallampati score together with decreased thyromental distance and limited joint mobility, anaesthetic management is troublesome due to the difficulties related with intubation and extubation (3). In this report, we present our experience regarding the use of awake fibreoptic bronchoscopic intubation (FOB) in a patient who had limited neck mobility due to occipitocervical fixation. Patient consent was obtained for presentation of the data.

Case Report

A 23-year-old male patient, 82 kg in weight, was admitted to our orthopaedics department for traumatic injury to the right forearm. He had type IIa odontoid fracture and "Hangman" fracture which occurred in a traffic accident 15 months ago. Subsequently, he had undergone occipitocervical fixation which had been performed by the neurosurgery team. Examination of the current lesion over the right forearm revealed that he had a full thickness cut extending to the ulnar artery and nerve, together with the superficial and deep tendons. In the pre-anaesthetic evaluation, it was determined that the patient's Mallampati score was 4, thyromental distance 5 cm, mouth opening grade II and sternomental distance 10 cm. Also, as the patient was unable to extend his head, awake FOB guided intubation was planned. Intramuscular atropine at a dose of 1 mg was given to reduce salivation 30 minutes before the intervention. After routine monitoring of vital signs, midazolam 2 mg was given intravenously to provide sedation. In order to produce vasoconstriction and topical anaesthesia, 2 sprays of 10% lidocaine was instilled through the appropriate nostril and to the hypopharynx. For blockade of lingual and pharyngeal branches of the glossopharyngeal nerve, 2 mL of 2% lidocaine was applied to the base of the palatoglossal arch on both sides (Figure 1). Blockade of the superior laryngeal nerve was achieved by injection of 3 mL of 2% lidocaine, 1 cm below the greater horns of the hyoid bone (Figure 2). For providing anaesthesia in the airway distal to the epiglottis, transtracheal blockade was performed by injection of 5 mL of 4% lidocaine through the cricothyroid membrane (Figure 2). The surface of the spiral embedded endotracheal tube was lubricated using 2% lidocaine gel and the tube was gently advanced into the oropharynx. The fibreoptic bronchoscope (FOB) was loaded with the endotracheal tube and introduced into the oropharynx. The tube was introduced to the trachea by sliding over the FOB, cuff of the tube was inflated to adjust its position and the FOB was gently withdrawn, and anaesthesia was maintained. The patient underwent a microsurgical operation to repair eight tendons, one artery, and one nerve and the surgery lasted for 5 hours. The patient with adequate spontaneous respiration and fulfilling the commands was extubated once the criteria for extubation were met.

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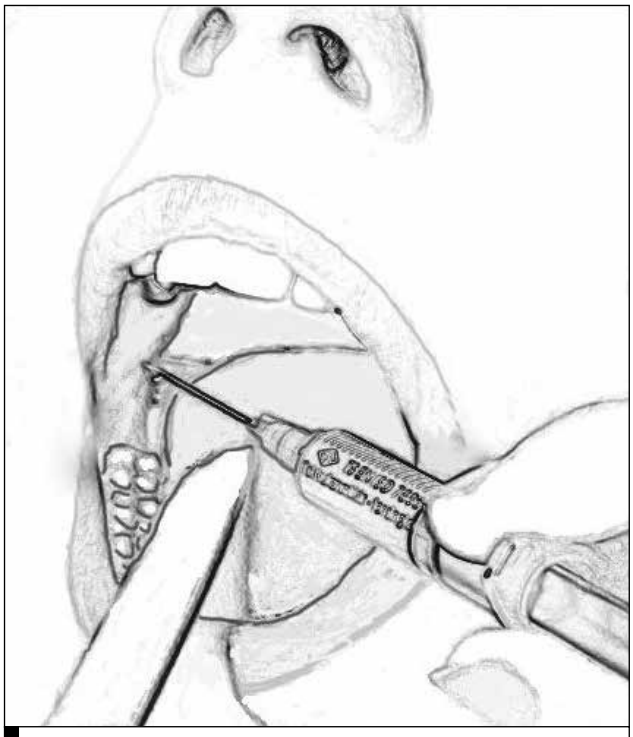

Figure 1. Anatomic site of injection for blockade of glossopharyngeal nerve.

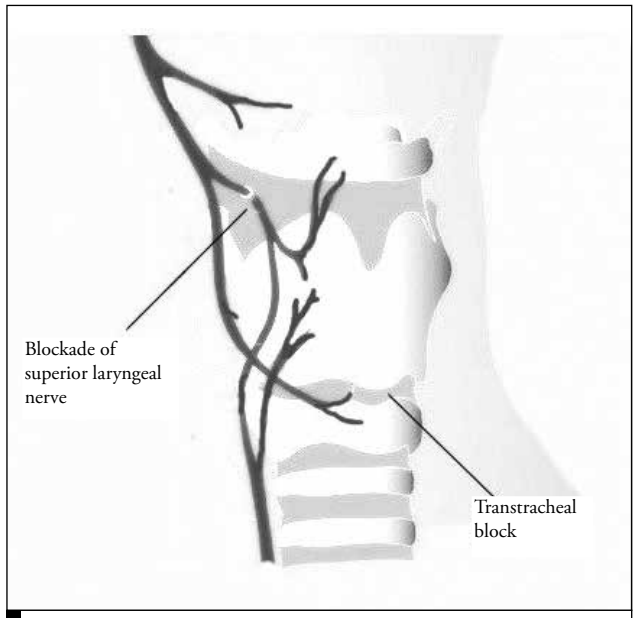

Figure 2. Anatomic site of injection for blockade of superior laryngeal nerve and transtracheal block.

Discussion

Nearly 30% of anaesthesia related deaths occur during intubation period. Therefore, we had decided to perform peripheral nerve block after the initial assessment of our patient. The potential complications related with the anaesthetic technique, toxicity of the local anaesthetic and injury to the nerve should be considered if a peripheral nerve blockade is planned (4). In our patient artery, nerve and tendons were cut, all together. A pre-procedural counselling was made with the surgery team and the patient. As the patient requested general anaesthesia because of his anxiety and as the surgery team could not predict the time (probably long) needed to complete the operation before inspecting the depth of the wound under anaesthesia and the need for complete immobility of the patient for nerve repair and the experience of the anaesthetist, peripheral nerve blockade was cancelled. It was decided to perform awake FOB guided intubation.

Options for airway management in patients with difficult airway include intubation using flexible fibre-optic bronchoscope via laryngeal mask, blind nasal intubation, retrograde intubation, intubation under spontaneous breathing and awake intubation under local anaesthesia. Although awake intubation is technically safer, it is a more difficult technique. Blockade with local anaesthesia is necessary before the procedure (5). The anaesthesiologist should maintain the cooperation with the patient without interruption throughout the procedure. In the present case, we used midazolam and the cooperation could easily be maintained. Fibreoptic intubation is the most commonly used technique in patients in whom direct laryngoscopy has failed (6). However, this technique has several drawbacks such as intubating the patient without achieving a sufficient depth of anaesthesia, sympathetic activation via protective reflexes, laryngospasm and increase in intraocular and intracranial pressures (7). In several studies, success rate of intubation using FOB was reported to be higher than 90% (8). In our patient, we thought that the intubation would be difficult because of the inability to rotate head as a result of cervical fixation and also because the Mallampati score was 4. As the patient had a high education level and as it was easy to maintain cooperation with him, we performed FOB guided intubation.

It should always be kept in mind that cases who meet criteria for difficult intubation may require repeat intubation after extubation; therefore, the tracheotomy set and the team should be kept readily available. In our case, extubation was performed after the criteria for recovery were completely met and the patient had spontaneous breathing and fulfilling the commands while his eyes open. Repeat intubation was not required. As the patient was stable and fully awake, the vital parameters were stable and the tracheotomy team was kept readily available, we did not consider to use a tracheal guide after the extubation.

Conclusion

In cases with occipitocervical fixation, which causes severe limitation of neck movements, the use of awake fibreoptic intubation should be kept in mind as an alternative way to manage difficult airway.

Conflict of Interest
No conflict of interest was declared by the authors.

Peer-review: Externally peer-reviewed.

Informed Consent: Written informed consent was obtained from patients who participated in this case.

Author Contributions
Concept - A.A.; Design - A.A., İ.Y., A.D., Ü.Y.T.; Supervision - H.K.; Analysis and/or Interpretation - A.A., A.D., İ.Y.; Literature Review - A.A., İ.Y., Ü.Y.T.; Writer - A.A., İ.Y.; Other - A.A., İ.Y., A.D., Ü.Y.T., H.K.

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