Awake Fiberoptic Intubation in a Patient with Cervical Fractures: A Case Report

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ABSTRACT
Awake fiberoptic intubation is a critical aspect of managing the airway in patients with cervical fractures and preventing secondary spinal cord injury. This technique is particularly important in cases of severe cervical stenosis, unstable fractures, and limited mouth opening. This case report

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*Sorumlu yazar Makale geliş tarihi: 30/05/2024 Makale kabul tarihi: 10/06/2024

evaluates the efficacy and safety of awake fiberoptic intubation in a 29-year-old male with multiple cervical fractures from a vehicle collision. The patient underwent successful awake fiberoptic intubation using the Spray-As-You-Go technique with remifentanil sedation, followed by uneventful surgery. The literature supports awake fiberoptic intubation as the gold standard for maintaining cervical stability and ensuring patient comfort. Future research should focus on refining these techniques, exploring new technologies, and establishing standardized protocols to improve airway management in cervical fracture cases.

Keywords: *awake fiberoptic intubation, airway management, cervical fractures,*

ÖZET

Uyanık fiberoptik entübasyon, servikal kırıkları olan hastalarda hava yolu yönetiminin ve ikincil omurilik yaralanmalarının önlenmesinin kritik bir unsurudur. Bu teknik, özellikle ciddi servikal stenoz, stabil olmayan kırıklar ve sınırlı ağız açıklığı vakalarında büyük önem taşır. Bu olgu raporu, bir araç kazasında çoklu servikal kırıklar geçiren 29 yaşındaki bir erkek hastada uyanık fiberoptik entübasyonun etkinliğini ve güvenliğini değerlendirmektedir. Hasta, remifentanil sedasyonu ile Spray-As-You-Go tekniği kullanılarak başarılı bir uyanık fiberoptik entübasyon geçirmiş ve ardından sorunsuz bir cerrahi operasyon gerçekleştirilmiştir. Literatür, servikal stabilitenin korunması ve hasta konforunun sağlanması açısından uyanık fiberoptik entübasyonu altın standart olarak desteklemektedir. Gelecek araştırmalar, bu tekniklerin rafine edilmesine, yeni teknolojilerin keşfedilmesine ve servikalkırık vakalarında hava yolu yönetimini iyileştirmek için standart protokollerin oluşturulmasına odaklanmalıdır.

Anahtar kelimeler: *uyanık fiberoptik entübasyon, havayolu yönetimi, servikal fraktürler*

INTRODUCTION

Airway management in patients with cervical fractures presents significant challenges, making awake fiberoptic intubation a critical technique. These patients are at risk of secondary spinal cord injury during intubation, necessitating meticulous attention and care. (1). The use of fiberoptic intubation enables a controlled and meticulous approach to airway management in complex cases. This technique is particularly valuable in situations such as severe cervical stenosis, unstable cervical fractures, and limited mouth opening (2). In this study, the efficacy and safety of awake fiberoptic intubation in the management of patients with cervical fractures were evaluated in the context of a literature review.

CASE REPORT

A 29-year-old man with no significant medical history (height, 180 cm; weight, 85 kg) was brought to the emergency department (ED) via an ambulance following a motor vehicle collision. Initial assessment revealed a Glasgow Coma Scale (GCS) score of 15 (E4, V5, and M6), stable vital signs, and no evidence of respiratory or circulatory distress. The neurological examination results were unremarkable. The patient reported experiencing pain predominantly in the neck and chest. Contrast-enhanced computed tomography (CT) of the entire body revealed fractures of the cervical vertebrae C5, C6, and C7, along with a sternal fracture (Figure 1). The patient was evaluated by the thoracic surgery team, who determined that stabilization of the sternal fracture was necessary. During the preoperative assessment, a comprehensive airway evaluation was performed to identify potential difficulties related to suspected cervical spine injury. The assessment included measurement of the Mallampati score and thyromental distance to gauge the ease of laryngoscopy and direct visualization of the vocal cords.

Figure 1. Contrast-enhanced computed tomography (CT) of the entire body revealed fractures of the cervical vertebrae C5, C6, and C7, along with a sternal fracture.

Airway Management

Given the potential instability of the cervical spine, awake fiberoptic nasal intubation (AFOI) with the Spray-As-You-Go (SAYGO) technique was used to secure the airway, supplemented with remifentanil infusion for sedation. Informed consent was obtained from the patient before the procedure.

The patient was continuously monitored for electrocardiography (ECG) findings, blood pressure, oxygen saturation, and respiratory rate. After explaining the procedure, 2 mg of intravenous midazolam was administered and remifentanil infusion was initiated to ensure patient comfort. Local anesthesia was achieved by spraying 1 mL of 10% xylocaine into the oropharynx and injecting 50 mg lidocaine into the trachea via the cricothyroid membrane. Subsequently, awake fiberoptic intubation (AFI) was performed by guiding a 7.0 endotracheal tube through the left nostril

using lubricant gel. Following successful intubation, anesthesia was induced with 50 µg fentanyl, 2 mg/kg propofol, and 0.6 mg/kg rocuronium. Anesthesia was maintained using sevoflurane and remifentanil. The surgery proceeded without complications, and the patient was successfully extubated. The patient was then transferred to the intensive care unit (ICU) with an Aldrete score of 9.

DISCUSSION

Airway management in patients with cervical fractures is a critical aspect of their care and requires careful evaluation to prevent further injury and ensure adequate oxygenation. Various approaches exist for managing the airway in such patients, each with its own benefits and considerations. A common concern in patients with cervical fractures is the risk of airway compromise due to cervical spine instability. Awake fiberoptic intubation has been identified as the gold standard technique for airway management in patients with traumatic cervical spine injuries, particularly ankylosing spondylitis (3). This approach allows intubation while minimizing cervical spine movement and reducing the risk of injury during the procedure.

Several studies have evaluated different intubation methods in simulated scenarios involving cervical spine immobilization. For instance, research has demonstrated that using advanced devices, such as the McGrath MAC® laryngoscope, can lead to faster intubation times, higher success rates, improved visualization of the glottis, and overall ease of intubation compared with standard direct laryngoscopy (4). These findings underscore the importance of selecting appropriate tools and techniques for airway management in patients with cervical fracture.

In addition, intravenous dexmedetomidine enhances patient comfort and sedation during awake fiberoptic intubation in patients with cervical spondylotic myelopathy (5). Various studies have compared different approaches to awake fiberoptic intubation. For instance, the efficacy of combined regional nerve blocks in ensuring patient comfort and safety during the procedure has been highlighted (6). Moreover, the use of novel tools such as the Shikani Optical Stylet has been explored to facilitate awake nasal intubation in patients undergoing head and neck surgery, further emphasizing the versatility of fiberoptic techniques (7). In our patient, cooperation and avoidance of cervical manipulation during intubation were prioritized. Premedication with midazolam facilitated conscious sedation while maintaining spontaneous breathing. The co-administration of remifentanil in-

fusion provided analgesic effects and synergistic sedation because of its short context-sensitive half-life. Remifentanil titration ensured a smooth procedure while preserving spontaneous respiration.

Local anesthetic was applied to the airway to enhance patient comfort and prevent gagging during intubation. In addition, a jaw-thrust maneuver was employed to optimize the visualization of the laryngeal inlet. Nasal intubation was required, and a combination of 1 ml of 10% xylocaine spray and 50 mg of lidocaine was injected into the trachea via the cricothyroid membrane during fiberoptic intubation to provide adequate analgesia to the upper airway.

Literature also discusses the importance of patient satisfaction and comfort during awake fiberoptic intubation. Studies have compared the use of dexmedetomidine with other sedatives, showing better ease of intubation and patient comfort with dexmedetomidine (8). Additionally, the psychological aspect of awake intubation has been studied, revealing that while patients may feel vulnerable, they also perceive being in safe hands during the procedure (9).

CONCLUSİON:

Awake fiberoptic intubation is an essential technique for managing patients with cervical fractures and provides a safe and effective method to secure the airway while minimizing the risk of secondary spinal cord injury. Its ability to offer optimal intubation conditions, patient comfort, and safety makes it invaluable in clinical practice, especially in scenarios involving severe cervical stenosis, unstable cervical fractures, and limited mouth opening.

Future research should focus on refining these techniques, exploring emerging technologies, and developing standardized protocols to enhance the safety and efficacy of airway management in patients with cervical fractures. Investigating long-term outcomes and patient experiences post-intubation will be crucial for shaping best practices and improving clinical care, ultimately ensuring safer and more effective airway management for vulnerable patients.

Author contributions

Sevgi Kesici: Study design, analysis, and interpretation, writing the article, critical revision of the article, and literature review.

Zeynep Ceren Yahşi: Data Collections, Literature Review,
Ozan Ülker: Data Collections, Literature Review.
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Kairatbek Miizamov: Literature Review. Analysis.
Sibel Oba: Literature Review, Critical Revision of the Article.
Onur Derdiyok: Data Collections, Analysis.

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