



OLGU SUNUMU / CASE REPORT

Approach to dental trauma occurring during intubation: case report

Entübasyon sırasında oluşan dental travmaya yaklaşım: olgu sunumu

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Cukurova Medical Journal 2018;43(1):211-214.

Abstract

The incidence of dental trauma reported during general anesthesia is 0.06-12.3%. The majority of perioperative dental trauma occurs during laryngoscopy and intubation, it may be observed when excessive force is applied to remove the airway, endotracheal tube or laryngeal mask. Dental injury may vary from simple fracture to restoration loss or avulsion (removal of tooth from the socket). Dental injury generally occurs in the upper front region and the left central incisor is most frequently affected due to the position of the laryngoscope. We aim to share an approach to dental trauma that may be encountered during general anesthesia administration in this case report.

Key words: Avulsion, dental trauma, intubation

Öz

Genel anestezi sırasında bildirilen diş travması insidansı % 0.06-12.3'dir. Perioperatif dental travmaların çoğu laringoskopi ile entübasyon sırasında ortaya çıkarken, airway, endotrakeal tüp ya da larengeal maske çıkarılması için aşırı kuvvet uygulandığında da görülmektedir. Dental yaralanmalar basit kırıktan restorasyon kaybı veya avulsiyona (dişin socketinden çıkması) kadar değişebilir. Dental yaralanma genellikle üst ön bölgede meydana gelir ve laringoskopun konumu nedeniyle sol orta kesici diş en sık etkilenir. Genel anestezi uygulamalarında karşılaşılabilecek dental travmalara yaklaşımımızı olgu üzerinden aktarmayı amaçladık.

Anahtar kelimeler: Avulsiyon, diş travması, entübasyon

INTRODUCTION

The main risk factors for dental trauma relating to laryngoscopy are difficult intubation and bad dental structure¹⁻⁵. Cases with dental pathologies are reported to have five times the risk of dental trauma and cases with difficult intubation have a risk twenty times as high^{6,7}. During intubation, if anesthesiologists cannot clearly see the glottis, they may use the upper teeth as a fulcrum. During laryngoscopy, support on the upper chin and thus the maxillary front teeth may improve the sight line and ease insertion of the endotracheal tube. Use of the laryngoscope in this way explains the high incidence of dental injury during difficult intubation⁸. In normal laryngoscopy maneuvers, avulsions, fractures and dislocations are frequently reported⁹. Gaudio et al. reported that there was no significant correlation between type of dental trauma

in cases with expected or unexpected difficult intubation¹.

Successful management of these common complications of anesthesia administration becomes important. Loss of a tooth in a patient due to dental trauma directly affects their quality of life and when considered from the clinician's perspective may cause life-threatening problems like tooth aspiration. Perioperative dental trauma is the most common complaint among all medicolegal problems related to anesthesia and comprises one third of all medicolegal cases related to anesthesia^{4,10}.

As previous evaluation of risk factors is required to prevent dental trauma, it is necessary to create standardized documentation and prevention strategies. In this case report we aim to present our approach to dental trauma occurring during intubation and precautions that may be taken.

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Geliş tarihi/Received: 12.01.2017 Kabul tarihi/Accepted: 12.03.2017

CASE

A 58-year old 76 kg male case with operation planned for coronary artery bypass surgery was taken for operation in American Society of Anesthesiologists physical situation risk group III. Preoperative evaluation found no systemic diseases apart from coronary artery disease and hypertension, with smoking habit. Physical examination determined Mallampati I, neck movement easy, mouth opening > 3 cm and thyromental distance > 6 cm. Oropharyngeal examination observed bone loss and receding gums linked to periodontal disease.



Figure 1. Splinting procedure performed

he case had electrocardiography, peripheral oxygen saturation, non-invasive pressure measurements, invasive arterial pressure and temperature monitoring applied. After three minutes of preoxygenation, 2.5 mg/kg propofol, 1 mg/kg lidocaine, 9 mcg/kg fentanyl, 10 mg dromicum and 0.6 mg/kg rocuronium were administered intravenously (iv) for induction. Endotracheal intubation was performed with a number 3 Macintosh blade. During laryngoscopy, the left upper central tooth of the case fell in a single piece into the oral cavity. After ensuring there was no foreign matter in the vocal cords, the case was successfully intubated. Again direct laryngoscopy was performed and the avulsed tooth was obtained from the oral cavity. At this point consultation with dentistry was requested and the avulsed left upper central tooth was immediately reimplanted in the socket and the insertion of the tooth clinically confirmed. During the operation, a splinting procedure was performed including right upper lateral and central teeth and left upper lateral and canine teeth (figure 1). The patient's relatives were given nutrition and oral care recommendations. Two weeks later, dental check-up was recommended for

clinical and radiographic examination and if necessary root canal treatment.

DISCUSSION

Dental trauma that may occur during perioperative anesthesia administration requires a systematic approach. Initially the case should be evaluated in terms of risk of dental trauma with precautions taken for high risk patients and the patient should be informed of the situation. The risk of dental trauma is increased by current dental diseases, crowns, bridges, restored teeth, prosthesis, isolated or mobile teeth and insufficient preoperative evaluation. Other risk factors for perianesthetic dental trauma include children from 6-8 years of age, patients over the age of 60, smoking, male gender, patients with difficult intubation, cardiothoracic surgery and emergency cases¹⁰⁻¹².

Another important factor in dental injury during endotracheal intubation is laryngoscopy technique and type of blade used. The laryngoscope should be moved directly upward without leaning on the upper incisors and maxillary chin^{4,10,11}. When more force than necessary is applied during laryngoscopy especially during difficult intubation, periodontal injuries are more frequently encountered in spite of special attention and care taken. Dental injury is greater when a Macintosh blade is used (as in our patient) and it is reported that the Miller blade should be chosen for patients at risk of dental trauma¹³. Additionally, reducing the size of the laryngoscope is recommended to prevent dental trauma¹⁴.

The most common dental injury during intubation is crown breakage (32.5%) and fractures (29.3%). The majority of times only one tooth is injured (72.8%) and mainly maxillary teeth are affected (74.3%)^{4,11,15,16}. The left side of the maxilla is more commonly affected than the right (41.7% and 32.6%). To observe the hypopharynx and glottis with a classic laryngoscope, the left hand moves the tongue behind the laryngoscope on this side. This movement on the left of the laryngoscope explains the increase in dental injury in the left maxilla. Molar teeth are affected 9.1% of the time and most commonly on the right (80%). This situation is due to endotracheal tube fixation mainly on the right side and the tip of the laryngoscopy moving to the right during insertion of the tube^{9,15,17}.

Preoperative evaluation by a dentist is reported to contribute to reducing the risk, especially in patients with risk factors¹⁸⁻²⁰. It is recommended that comprehensive preoperative examination of patients documents any mobile teeth in the dental scheme, degree of receding gums, bridges, veneers or tooth restorations. In this evaluation, factors relating to difficult intubation should be analyzed and a prevention strategy planned according to the risk of dental injury in each patient, patients should be informed of risks relating to dental injury and it is recommended that this information be documented in writing²¹.

The majority of dental trauma comprises a serious risk of tracheal aspiration during intubation and intubation stages when the muscles are relaxed and respiratory tract reflexes suppressed. As a result, it is important to find and remove the piece of broken tooth. If the tooth is in an area accessible by hand, it may be removed by hand; otherwise hands should not be used to remove the piece as they may push the tooth inwards. The tooth piece may cause obstruction and perforation in the upper/lower respiratory tract or gastrointestinal system linked to size. If the location of the avulsive piece is not known, head, neck, chest and abdomen imaging should be immediately performed in the operating room to determine whether the tooth was aspirated or not or whether it passed into the gastrointestinal system^{22,23}.

If a tooth avulses in patients with dental injury, splint or reimplantation should be performed and if done within the first 30 minutes it is reported the success rate reaches 90%^{24,25}. If a permanent tooth is removed from the socket, ideally the tooth should be immediately replaced in the socket; otherwise it is recommended that it be stored in fresh milk or as a secondary choice normal saline. Splinting a tooth or teeth fixes them in position preventing further trauma and allowing improvement. In all dentoalveolar injuries, the primary aim is to treat any symptoms and preserve the vitality of the tooth or teeth²⁶.

Preoperative evaluation observed that the majority of teeth were rotten and broken in both cases; however the cases did not consult with a dentist. During intubation the Macintosh blade was used, and after ensuring the avulsed tooth was not in the vocal cords, the cases were successfully intubated. The avulsed tooth was removed from the oral cavity and left in physiologic serum and necessary

intervention was performed intraoperatively after consultation with a dentist.

In conclusion, dental trauma related to anesthesia cannot be fully prevented; however we believe increasing awareness of the problem and evaluation of risky patients preoperatively by a dentist will aid in reducing dental trauma. Additionally we believe it is necessary to create a working protocol between anesthesiologists and dentists. When the size of the problem and the physical, economic and legal problems caused by dental injury in the anesthesiology field are considered, we think it is necessary for anesthesiologists to be informed about techniques used for dental rehabilitation.

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