

Management of dental trauma to a developing permanent tooth during endotracheal intubation

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Abstract

Anesthesiologists consistently work in the mouth of patients but are not exposed to comprehensive education of teeth, the surrounding structures, and intraoral prosthesis. One of the most common adverse events related to anesthesia is perioperative dental damage. To minimize these dental injuries, a preoperative assessment of patient's dentition and intra-oral tissues should be undertaken.

Key words: Avulsion, dental, endotracheal intubation, re-implantation

Introduction

Intraoral manipulation is necessary during general anesthesia involving endotracheal intubation. Although laryngoscopy is a safe procedure and complications rarely occur, intraoral manipulation can produce damage to soft and hard tissues of the oral cavity, patient discomfort, and postoperative pain.

Dental injury has been reported as the most common anesthetic-related incident.^[1] It is also one of the common causes of litigation in anesthetic practice.^[2] Patients with pathological changes, especially if involving pathosis of the incisors, are considered to be at the greatest risk of oral tissue trauma following laryngoscopy and endotracheal intubation.^[3,4] Most complications during anesthesia are related to unrecognized problems. Recognizing and understanding; oral and dental pathological changes; and the presence of dental prosthesis are thus important.

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Case Report

An 8-year-old boy reported to the Department of Pedodontic and Preventive Children Dentistry complaining of a missing upper front permanent tooth since 1 month. The child's parents gave a history of missing tooth during the tonsillectomy procedure under general anesthesia and the same was mentioned in the discharge summary. On examination, the patient was moderately built, well nourished, conscious, and cooperative. Extraorally there were no visible scars or lacerations. On intraoral examination an upper left central incisor and a mesially erupting upper left lateral incisor were not seen [Figure 1]. An orthopantomograph was taken to confirm the finding, which revealed a missing upper left central incisor and a mesially-erupting upper left lateral incisor with a developing root [Figure 2].

We decided to give a removable anterior space maintainer, i.e. removable partial denture (RPD) to prevent the mesial drifting of 22. Both the child and the parents were pleased with the new look of the child, which gave him a normal appearance [Figure 3]. His mother was advised to maintain good oral hygiene for the child; recall visits to make any necessary adjustments for the RPD, if needed; and to go for an implant, fixed prosthetic appliance, or orthodontic correction in future.

Discussion

The loss of maxillary incisors in childhood is problematic, especially up to 10-12 years of age, and predictable treatment methods are difficult.^[5] Children in the age group of 6-8 years are susceptible to the loss of maxillary teeth during endotracheal



Figure 1: patient showing a missing 21, mesially erupted 22



Figure 3: postoperative photograph showing replacement of the avulsed tooth

intubation due to the prevalence of immature roots, increased overjet, ectopic eruptions, dilacerated roots, or pathology.^[6] The principle treatment options are: (a) re-implantation of the avulsed tooth immediately within a certain time period,^[7,12] (b) maintaining the space by giving a space maintainer or reopening the space for auto-transplantation using a premolar; future prosthodontic restoration of missing teeth or single tooth implant, (c) total orthodontic space closure, followed by prosthodontic modification of the lateral incisor to imitate the central incisor.^[8]

It is advisable to re-implant the avulsed tooth into the socket within the specified time interval in order to preserve the vitality of the tooth and also to promote root completion.^[7,9,10]

If dental injury occurs in children during laryngoscopy and intubation an evaluation should be done, as soon as possible, by a pediatric dentist to determine the extent of the injury, to confirm the location and ensure successful retrieval of the



Figure 2: Orthopantomograph

avulsed or broken tooth. In the case of any tooth fragment is missing, a chest radiograph is necessary to exclude aspiration. In children, avulsion of a primary tooth does not require treatment, as replacement into the socket can damage the underlying permanent successor. When a permanent tooth is avulsed, it should be stored in normal saline or cool fresh milk until it can be splinted or re-implanted. After a traumatic intubation, the success of the treatment is primarily determined by the time elapsed since injury. If re-implanted within 30 min, the success rate is very high. If the young permanent tooth is avulsed during general anesthesia, a pediatric dentist must be informed immediately to replace the tooth in the socket and splint the tooth.

Dental damage in the operating room may also be caused by surgeons such as otorhinologists by inadvertent injury during laryngoscopy. Traumas to a patient's dentition have also been reported following endoscopic and bronchoscopic interventions.^[11] In the case of such a trauma, the patient should be explained the damage, once sufficiently awake. This should include a clear apology and a description of the events that led to damage and the efforts made to minimize any complications. All actions and discussions should be clearly documented in patient's records.

During the preoperative assessment, the anesthesiologist should enquire about loose teeth, unstable crowns, veneers, bridgework, and any intraoral prosthesis (dentures or orthodontic appliances). Minimizing dental injuries begins with the anesthesiologist's preoperative assessment of the patient's oral health including dentition. Documentation of the patient's preoperative dental condition and informing the patient about the potential dental damage will diminish costs for any related postoperative dental treatment. Upon discovery of a potentially hazardous dental condition, a consultation with a dentist should be considered before proceeding with the surgical procedure. Whilst there is no standardized method for recording this, a simple diagram and a brief written description may be satisfactory. The patient should be warned of the potential for dental damage and its incidence. All risk factors, both anesthetic and dental, should

be identified and explained to the patient.^[12]

The flange of the Macintosh blade is responsible for much damage, and alternative equipment or techniques of endotracheal intubation should be considered, particularly when risk factors are present. Custom mouth guards can be useful to decrease the force of a laryngoscope affecting the upper central incisors. A management plan can help control loss if damage does occur.^[1]

Conclusion

Oral tissue trauma, a common anesthetic complication, should be considered a recognized hazard of endotracheal intubation during general anesthesia. Before administering anesthesia, understanding and recognizing the oral anatomical conditions and pathological changes may help the anesthesiologists prevent oral and dental complications, thus avoiding legal suits.

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