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Case Report

Perioperative Dental Trauma: Fixed Upper Dental Prosthesis Fixed by Guardel Oropharinger Cannula in The Extubation

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Summary

Perioperative dental trauma is an unpreventable, uncommon adverse event, being the first cause of claims for malpractice in anaesthesiology. Its main risk factors are poor dentition, previous dental restorations and difficult airway. It can present at any time during the perioperative period, mainly during intubation. In extubation it is related to the use of Guedel's oropharyngeal cannulas. In this article we describe and analyse a case of fracture of fixed upper maxillary dental prosthesis that occurred during the emergence of anesthesia. Recommendations on its prevention and management are given.

Keywords: Airway Management; Dental; Dental Prosthesis; General Anesthesia; Intubation; Injury; Management of Extubation

Introduction

Perioperative dental trauma is a rare cause of morbidity, but continues to be one of the most common adverse events related to general anesthesia, being responsible for the largest number of complaints of malpractice against anesthesiologists, representing 29% of the total; with functional, aesthetic, economic and legal consequences [1,2].

Its incidence is 0.02 to 0.07% in retrospective studies and up to 12.1% in prospective studies [3-5]. 75% of cases occur during laryngoscopy and intubation and 25% in the emergency and recovery of anesthesia [6]. The dental lesion is identified immediately by the anesthesiologist by 86%, and by 14% by the patient or another member of the medical team [7]. The teeth of the upper jaw are the most predisposed to injury (74.3%), with the upper central incisors being the most affected in 62%, especially the left central upper incisor [8]. These lesions are more frequent in patients older than 50 years when there are risk factors for difficult airway or involvement in the structure of the teeth [9]. Next, we report a case of fracture of two dental pieces (upper incisors) in a fixed total prosthesis of the maxilla of a 45-year-old patient who underwent an endometrial polypectomy by hysteroscopy under a balanced general anesthesia, an adverse event that was presented during the emergency phase.

Clinical Case

45-year-old female patient scheduled for endometrial polypectomy by hysteroscopy. In the pre-anesthetic assessment, it referred to a history of gastroesophageal reflux. Previous surgeries: gastric sleeve, cholecystectomy, gynecological-obstetric history G1P1C1. Physical examination: Weight 73 Kg, Size 150 cm. IMC 32.44. Airway assessment: Oral opening greater than 4 centimeters; Mallampati grade I; Thyromentonian distance of 5 cm, with fixed upper and lower prostheses. It is decided in the surgery due to antecedent of reflux, tracheal intubation, with tube No. 7.0, larynx grade II, intubation without complications. At the end of the surgery, the tracheal tube is removed in anesthetic depth and a Guedel oropharyngeal cannula is placed. Normal ventilation When the patient wakes up, she bites the cannula and fractures the upper prosthesis in the apical part of two upper incisors. The patient in the recovery room was informed of the adverse event.

Discussion

An adverse event is the result of health care that unintentionally produces damage, which can be preventable or not preventable. Perioperative dental trauma is considered an event not necessarily preventable whose impact can be avoided or minimized if certain safety guidelines are met. It is an unusual undesirable situation and at the same time it is the main cause of complaint due to poor attention in anesthesiology due to the dissatisfaction and dissatisfaction that it generates for the patient.

Perioperative dental damage, in addition to laryngoscopy, can occur by aggressive suctioning of the mouth, by the insertion of a device for the oropharyngeal airway such as the Guedel cannula and by the vigorous bite of the orotracheal tube or laryngeal mask during the emergency of anesthesia. Other triggers include forced removal of a device from the oral airway, orotracheal tube or laryngeal mask, and chills during the recovery phase that can cause spasm of the masseter muscles and cause excessive pressure on the teeth [5].

The incisors are teeth with a single root and small cross-sectional area, so they can be easily injured when subjected to a vigorous vertical force. Values of up to 80 Newtons have been documented in the strength of the bite during the awakening of anesthesia. The molars have multiple roots with a wider cross-sectional area, so they tolerate the vertical forces better [3]. The most reported injuries in literature are: enamel fracture 32%, subluxation / loosening 23%, dislocation 3.8%, crown fracture 1.3%, root and crown fracture 1.3%, tooth loss 10.3% and other injuries 21.8% (include damage to dental restorations, crowns prosthesis, fixed partial dentures and dislocation of veneers) [7]. Risk factors can be divided into factors that depend on the patient and factors that depend on the anesthetic or iatrogenic procedure. Dependents of the patient [10].

- Children in the mixed dentition stage (5 - 12 years)

- Dental caries - Periodontal disease

- Previous restorations

- Veneers, crowns, bridges and implants

- Protruding upper incisors

- Extensive loss of tooth surface

- Teeth handled with root canal treatment

- Sentinel teeth

- Structural abnormalities (amielogenesis imperfecta or dentinogenesis imperfecta)

- Previously traumatized tooth

- Difficult airway

- Diabetes mellitus, autoimmune diseases, chemotherapy, radiotherapy in the mouth, smoking [11]. Dependents of the anesthetic or iatrogenic procedure

- Laryngoscope: in relation to the difficult airway is the factor responsible for the majority of dental injuries. Less common in relation to the operator due to poor application of the force vector for visualization of the glottis.

- Use of oropharyngeal cannulas: there is a risk of dental trauma during insertion, during anesthesia maintenance and at the time of extraction. It represents the second cause of dental injury after laryngoscopy, with an incidence of 20% in some series.

- Suction devices: an aggressive suction in the posterior region of the mouth can subject the anterior teeth to lateral forces [12]

- Supraglottic devices: the literature has reported few cases of dental trauma. Trauma can occur during withdrawal when the patient clenches the teeth [12]

- Emergency surgery in relation to multiple dental injury [8].

The level of training of the anesthesiologist does not influence the risk of dental trauma, although the lack of experience of the operator is considered a trigger in some studies [11].

In conclusion, poor teething and difficult intubation are the main risk factors for perioperative dental trauma, followed by the use of the oropharyngeal cannulas.

Preoperative Evaluation

In the preoperative evaluation, risk factors for dental trauma must be identified. You should ask about lost teeth, mobility of the same, state of the gums, fistulas, purulent discharges and obviously identify the predictors of difficult airway. When the patient is asked to open their mouth, some will show a poor dentition and will have mobile teeth with a high risk of avulsion and aspiration during the perioperative period. The preoperative presentation of a poor dentition should be described in the clinical history. Terms such as “no mobility” or “intact” are not always illustrative. A somewhat more descriptive annotation of the patient’s periodontal status may be helpful: “poor oral hygiene with generalized periodontal disease, multiple movable teeth and partial edentulous in both arches” succinctly summarizes the patient’s dentition that is vulnerable to damage. These findings are reported and confirmed to the patient in order to explain the risks inherent to the manipulation of the airway, as well as to minimize the costs of treatment if an injury occurs during the transoperative period [5]. The dental lesion that requires intervention must have an accuracy of 0.02% [13]. The documentation of pre-existing conditions and an honest discussion of the risk of dental injury with the patient and their family or their legal representatives will reduce the risk of claims. This information must be recorded in the informed consent. If time permits and there is a dental health problem, it should be referred to a dental consultation [14].

The preoperative evaluation will determine the strategy to be followed, type of anesthesia, manipulation of the airway, laryngoscope blade and implementation of a dental protection device. Patients should be examined after intubation, after extubation and after recovery and any findings should be recorded [8]. Patients with Mallampati III or prominent teeth have a 90% probability of leaf-tooth contact. In these cases, the use of leaves without a neck (Bizzarri-Guiffidra) or a low neck (Cranwall

or modified Macintosh) is recommended, since the distance between the leaf and the teeth is increased without reducing the visibility to the larynx. Plastic sheets have less potential risks of dental fracture compared to metallic ones, but they are contraindicated in difficult airway. The use of a laryngeal mask reduces the incidence of dental injury [5,11]. In patients with a high risk of difficult area, the use of a fiberoptic bronchoscope or video laryngoscope with a tactile stylet (Bougie) is preferred.

Tooth protectors reduce the risk of dental trauma by reducing the forces exerted on the upper incisors during laryngoscopy. There is no consensus on his recommendation. Some studies reserve their use in situations of greater risk (dentures in very poor condition), while others recommend their use in a systematic way. It is contraindicated in patients who have difficult intubation criteria since they reduce the opening of the mouth, limiting the visualization of the larynx and increasing the level of difficulty [11].

During extubation, the oropharyngeal cannulas should be used with caution for patients with vulnerable anterior teeth and should not be used as bite blockers. Nasopharyngeal cannulas are a better choice for patients who are at risk of dental injury [5]. When preparing extubation, a bite blocker should be used in the premolar or molar region. A bite blocker can be made with a wooden tongue to which tape has been rolled several times. A roll of gauze [5] can also be served. Improper positioning of the blocker can cause damage to the anterior denture [4].

In the face of perioperative dental trauma, it is imperative that you document and consult with the Dentistry Service. If there is avulsion, the tooth or all fragments should be collected in case of fracture. If the location of these is unknown, a chest x-ray should be done to determine if it has been aspirated or passed into the digestive tract. Most fragments will pass into the gastrointestinal tract without complications. However, large fragments of prostheses can cause perforation or intestinal obstruction. For which they may require interventions for their extraction. In case of avulsion, the tooth should be stored in normal saline or fresh pasteurized milk to be reimplanted. Not always the anesthesiologist is responsible for dental trauma. Other specialists such as gastroenterologists, pulmonologists, maxillofacial surgeons and otolaryngologists may be involved [5].

When the patient is sufficiently awake, they should be given clear and precise information about what happened with a description of the events that led to the damage and efforts to minimize complications. It is the responsibility of the anesthesiologist to interconsultate dentistry urgently. The patient should not leave the hospital without a written treatment and follow-up plan. You must provide a telephone number and address for the subsequent consultation [8].

Analysis of The Clinical Case

In this case report, risk factors for perioperative dental trauma, the use of a dental prosthesis and the placement of a Guedel's oropharyngeal cannula, which ultimately was responsible for the adverse event that occurred during extubation, are considered to be risk factors. presented the bite of the cannula, subjecting the upper prosthesis to high pressures, which produced the fracture of its central upper incisors. Despite being a patient with grade 1 obesity, there were no predictors of difficult intubation, which means that a weakening of the prosthesis caused during laryngoscopy is ruled out, describing the intubation without complications. Patients who use fixed dentures should be considered high risk for perioperative dental trauma. Given the procedure to which the patient was subjected, endometrial polypectomy by hysteroscopy, the instrumentation of the airway had been avoided by means of a regional anesthesia. Also patients with a high risk of dental injury, Guedel's oropharyngeal cannulas should be used with caution or using a nasopharyngeal cannula, indicating the use of a bite blocker to dissipate the force in the molars or premolars, which prevents the fracture of the incisors.

The informed consent of the institution was revised, which does not have a space dedicated to the risk of dental trauma, for which there is a greater risk of exposure to complaints or demands. It is important that the institutions that have the anesthesiology and surgery services have the protocols for the prevention and management of perioperative dental trauma.

Conclusion

Perioperative dental trauma is an adverse event that cannot be prevented, so during the preoperative evaluation it is important to identify the risk factors, mainly the state of the patient's dentition and the predictors of difficult intubation that will determine the way to implement the airway. during the intraoperative period. During awakening, bite blockers should always be used. Guedel's oropharyngeal cannulas should not be used in patients at high risk of dental trauma, and may be replaced by nasopharyngeal cannulas; They should not be used as bite blockers since they can cause some type of dental injury in up to 20% of cases.

The risk of perioperative dental trauma should be discussed with the patient or his family during the preoperative evaluation and should be recorded in the informed consent in order to reduce demands for malpractice.

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