G4 Dental Injuries During General Anesthesia: Risk Management and Forensic Perspectives

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Learning Overview: After attending this presentation, attendees will have an understanding of the risks and causes of dental damages during general anesthetic procedures and how to evaluate accidental versus non-accidental lesions due to negligence.

Impact Statement: This presentation will have an impact on the forensic community by presenting the retrospective analysis of dental injury claims and by offering a possible solution to reduce damage from the forensic analysis of the dental lesion and intubation dynamics via the use of a tailored and 3D-printed splint.

General anesthesia requires an endotracheal intubation performed by an anesthesiologist using a laryngoscope to maintain a patient's airway. In complex cases and in patients with dental vulnerabilities, the oral-tracheal intubation procedure can cause dental lesions. According to Givol, dental trauma and injuries represent the main causes of medicolegal compensation claims after general anesthesia.[1] Retrospective studies evaluate an incident rate of 0.02–0.07% of cases; according to other, prospective studies, the percentage rises to 12.1–25%.[2-7] The teeth most affected are the upper incisors, followed by the lower incisors.[8-11] The main injuries to the teeth include subluxations, avulsions, enamel injuries, crown fractures, and root fractures.

This retrospective investigation aims to quantitatively and qualitatively analyze the claims received by the Hospital *Città della Salute e della Scienza* of Turin, Italy, that were made by patients undergoing general anesthesia in the period 2011–2020, with the goal of understanding the dynamics of the traumatic events experienced and finding a possible definitive solution for patients with dental vulnerabilities.

Materials and Methods: In the period from 2011 to 2020, the Hospital received 576 claims for compensation, of which 47 were selected as related to dental injuries. Only 24 were found to be secondary to the oral-tracheal intubation procedure. The sample examined represents all patients treated in elective surgery, aged between 22 and 76 years, who were divided into three age categories: <35 years; 35–60 years; and >60 years. Cases were analyzed to evaluate the responsibility of the anesthetist, the oral condition of the patients, and the compensation paid. An anonymous questionnaire was also delivered to 21 anesthesiologists who were working in the same hospital to evaluate their use or misuse of the standard protective splint supplied.

Results: The patients were distributed according to age: Group A, with patients <35 years of age (8.4% of claims were dental related); Group B, with patients between 35 and 60 years of age (41.6% of claims were dental related); and Group C, with patients >60 years of age (50% of claims were dental related). Claims related solely to dental treatments ranged from €300 to €10100 in those cases of assessed negligence. The teeth most commonly involved were the central and upper lateral incisors (in 87.5% of the cases), the lower incisors (in 12.5% of the cases), and the lower canines (in 4.1% of the cases). The anesthesiologists interviewed confirmed either sporadic use, or even misuse, of dental protective devices in 61.9% of the cases; 66.67% of those surveyed said they would definitely use a protective splint, but that the splint should be thinner and tailored to the individual patient.

Discussion and Conclusions: The forensic analysis of the claims for dental damage highlights that patients' poor oral health is one of the principal causes of dental damage during intubation but that the misuse of the protective device supplied by the hospital is often a contributing factor. Once a dental vulnerability has been identified by the anesthesiologist through the collection of the patient's medical and dental history, a dental visit should be requested to evaluate the dental fitness of the patient.[12] Dentists should treat teeth at high risk of damage (that is, with old restorations or critical periodontal conditions) and/or proceed with a custom-made protective splint for the patient to wear prior to the endotracheal intubation, which would significantly reduce the risk of dental damage.[13] Per this study, the best outcome in the protection of teeth during tracheal intubation procedures can be achieved by using an intraoral scan of the patient and a custom-made, 3D-printed mouthguard.

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Negligence, Endotracheal Intubation, Dental Claims

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