

Perianesthetic dental considerations

Accidental dental injuries are known to occur during anesthesia administration. Although the reported incidence of perioperative dental injury is 0.02%–12.1%,^[1,2] the actual incidence is probably much higher, as dental cracks often go unnoticed and unreported. Yaghmaei *et al.* reported a high incidence of dental injuries (73.3% and 90% following nasal and oral intubation, respectively) with a high prevalence of invisible dental injuries such as dental cracks.^[3]

The risk factors for perianesthetic dental injury include (i) age - children with mixed dentition (aged 5–12 years)^[4] and patients in the age group of 50–70 years;^[5] (ii) difficult intubation - limited mouth opening, limited mobility of the mandible, poor visibility in the hypopharynx, short thyromental distance, and low neck mobility;^[6] (iii) dental factors - caries, gum disease, protruding upper incisors, isolated teeth, previously injured or loose teeth, veneers, crowns, bridgework and implants, large anterior restorations, root-treated teeth, structural abnormalities of enamel or dentine,^[4] and anterior crowding of teeth;^[6] and (iv) patients with diabetes mellitus, autoimmune diseases, smokers, bruxism (habitual teeth grinding), early tooth decay in childhood, following chemotherapy or prior radiotherapy to the oral cavity.^[7]

A preanesthetic dental evaluation should include a detailed dental history and examination with particular attention to maxillary central incisors, these being most vulnerable to injury.^[6] Preexisting risk factors should be identified. Patients with poor dentition should be advised a dental consultation. Dental injury can be minimized by restoring caries, replacing lost or loose anterior restorations, and splinting or extraction of loose teeth.^[4] A note of preexisting dental condition, dentures, bridges, and caps, previously damaged or missing teeth, should be made. A preprinted dental chart [Figure 1], modified from dental chart suggested by Davies and Eagle,^[8] may be used to put patient's dental status to record. Patients must be advised to take out removable dentures before anesthesia. However, partial dentures may be left in place during laryngoscopy to protect the native teeth; dentures should be removed following intubation to prevent dislodgement.^[4] Dental jewelry is a concern as it may interfere with airway management and carries the risk of accidental dislodgement. Jewelry that is easily removable should be removed and that which cannot be removed or the patient refuses to remove should be protected. Informed consent for anesthesia should include the risk of

To encircle abnormal teeth and mark as D/M/F/L/I	
Right upper jaw	Left upper jaw
8,7, 6, 5, 4, 3, 2, 1	1, 2, 3, 4, 5, 6, 7,8
Right lower jaw	Left lower jaw
8,7, 6, 5, 4, 3, 2, 1	1, 2, 3, 4, 5, 6, 7,8

Figure 1: Dental chart. Teeth are numbered sequentially from the midline. Abnormal teeth are encircled and the abnormality is indicated as follows: D - decayed; M - missing; F - filled/crown; L - loose; I - implant

dental trauma, more so when dental problems are identified preoperatively. Implications of dental jewelry, if *in situ*, should be explained and recorded.

In patients whose teeth are vulnerable to damage, airway instrumentation should preferably be avoided^[4] or done by a more experienced anesthesiologist. It must be performed only after depth of anesthesia and muscle relaxation is adequate. Aggressive laryngoscopy and use of upper teeth as a fulcrum for the laryngoscope should be avoided. When risk of dental trauma is high, the use of a video laryngoscope,^[7] laryngeal mask airway, or fiber-optic approach^[4] to airway management may be considered. Care should be taken while inserting orogastric tubes, suction catheters, and endoscopes.^[4] The use of nasopharyngeal airway instead of an oropharyngeal airway is preferable in patients with vulnerable anterior teeth. Even trivial trauma during airway instrumentation may completely dislodge a loose tooth. Although preoperative extraction of loose teeth increases patient safety, it may not be cosmetically acceptable to some patients nor feasible in emergency situations. A loose tooth may be secured by tying its base with silk or thread, and bringing both free ends of the thread out of the patient's mouth together and taping it to the side of the face.^[9] In the event of tooth dislodgement, it can be pulled out with the silk. Tooth protectors, if used, may make laryngoscopy more difficult by reducing the space in the oral cavity due to their thickness, increase likelihood of oral trauma, and pose additional risk of itself getting aspirated.^[10] Applying a strip of poly foam to the flange, padding teeth,^[11] gauze rolls, and folded tape^[12] has been used to prevent injury.

During emergence from anesthesia (to prevent biting), bite blocks made from suitable material should be placed between the molar teeth and not between incisors. This allows dissipation of biting forces through the stronger multi-rooted molars instead of weaker single-rooted incisors.^[10] A one or two inches wide cloth adhesive tape may be wrapped several

times on one end of a wooden tongue depressor or a soft roll of gauze may be used as a bite block.^[10] An oropharyngeal airway should not be used as a bite block.^[4] Postoperative shivering should be controlled to prevent dental injury that may occur subsequent to excessive teeth clenching, grinding, or masseter muscle spasm.^[10] Dentition should be checked for any loose or missing teeth, including dental jewelry if was *in situ*, and status should be documented.

In the event of accidental dental injury such as avulsion or fragmentation of the tooth, the operating table should be given a Trendelenburg tilt. The avulsed or broken dental fragment, if visible should be retrieved using Magill forceps. At times, surgery or endoscopy may be required for retrieval. A chest radiograph may help locate a missing dental fragment. Nonradio-opaque dislodged prostheses may require direct visualization.^[4] The avulsed tooth should be placed on its crown, without touching the root and preserved in normal saline.^[13] Urgent dental consultation should be arranged for possibility of reimplantation of a permanent tooth within 30 min. A deciduous tooth should not be reimplanted in its socket as this may damage the underlying permanent bud or erupting tooth.^[13] If the tooth is loosened, return it back to position, apply digital pressure, and seek immediate dental opinion.^[12] Patients should be informed of peri-operative dental injuries, even if caused by the surgeons operating in the oral cavity. This should be documented.

To conclude, anesthesiologists should perform preanesthetic dental evaluation and document their findings. Risk of dental injury must be explained and included in the written informed consent. Measures to minimize dental injury should be taken. If injury occurs, it should be discussed with the patient and a dental consultation arranged. This is not only ethical but also increases patient satisfaction.

Financial support and sponsorship
Nil.

Conflicts of interest

There are no conflicts of interest.

Parul Mullick, Ajay Kumar¹, Smita Prakash

Department of Anaesthesia and Intensive Care, Vardhman Mahavir Medical College and Safdarjung Hospital, ¹Department of Anaesthesia and Critical Care, Deen Dayal Upadhyay Hospital, New Delhi, India

Address for correspondence: Dr. Parul Mullick,
Department of Anaesthesia and Intensive Care, Vardhman Mahavir
Medical College and Safdarjung Hospital, New Delhi, India.
E-mail: parash93@yahoo.com

References

- Owen H, Waddell-Smith I. Dental trauma associated with anaesthesia. *Anaesth Intensive Care* 2000;28:133-45.
- Chen JJ, Susetio L, Chao CC. Oral complications associated with endotracheal general anesthesia. *Ma Zui Xue Za Zhi* 1990;28:163-9.
- Yaghmaei M, Ejlali M, Dahi M, Ghassemi M, Mohajerani H, Pourdanesh F, et al. Minor dental injuries (cracks) due to oral and nasal endotracheal intubation and related factors in Tehran Taleghani Hospital. *J Dent Sch* 2013;30:240-7.
- Windsor J, Lockie J. Anaesthesia and dental trauma. *Anaesth Intensive Care Med* 2008;9:355-7.
- Givol N, Gershtansky Y, Halamish-Shani T, Taicher S, Perel A, Segal E. Perianesthetic dental injuries: Analysis of incident reports. *J Clin Anesth* 2004;16:173-6.
- Idrees SR, Fujimura K, Bessho K. Dental trauma related to general anesthesia: Should the anesthesiologist perform a preanesthetic dental evaluation? *Oral Health Dent Manag* 2014;13:271-4.
- Brandão Ribeiro de Sousa JM, de Barros Mourão JI. Tooth injury in anaesthesiology. *Rev Bras Anesthesiol* 2015;65:511-8.
- Davies JM, Eagle CJ. M.O.U.T.H.S. *Can J Anaesth* 1991;38:687-8.
- Lee BB, Jiang N. Loose – But not lost- – Tooth. *Anesth Analg* 2005;101:920.
- Yasny JS. Perioperative dental considerations for the anesthesiologist. *Anesth Analg* 2009;108:1564-73.
- Tiku AM, Hegde RJ, Swain LA, Shah FR. To assess and create awareness among anesthetists regarding prevention and management of injuries to the teeth and their associated structures during general anesthesia. *J Indian Soc Pedod Prev Dent* 2014;32:58-62.
- Burton JF, Baker AB. Dental damage during anaesthesia and surgery. *Anaesth Intensive Care* 1987;15:262-8.
- Poorsattar Bejeh Mir K, Poorsattar Bejeh Mir A. Neglected orodental facts during general anesthesia and intensive care unit admission in pediatric population. *Rev Bras Anesthesiol* 2012;62:847-51.

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

Access this article online	
Quick Response Code:	Website: www.joacp.org
	DOI: 10.4103/joacp.JOACP_202_16

How to cite this article: Mullick P, Kumar A, Prakash S. Perianesthetic dental considerations. *J Anaesthesiol Clin Pharmacol* 2017;33:397-8.