International Journal of Drug Research and Dental Science
Volume 5 Issue 1 (Page: 16-19), 2023 ISSN: 2582-0826

Management of Medical Emergencies in the Dental Setting; Laryngospasm

Ashok M. Badhe, BDS
General Dentist, India.

Review Article
***Corresponding Author**: Ashok M. Badhe**,** General Dentist, India.
E-mail: ashokbadhe@gmail.com
Crossref doi: https://doi.org/10.36437/ijdrd.2023.5.1.C

ABSTRACT

Laryngospasm is a common complication in the dental setting. Although it can be self-limited in some cases, if it persists and goes untreated it may be life-threatening and cause serious complications. While it is more common in the oral surgery setting it may also occur while under the care of a general dentist. This article discusses laryngospasm with an emphasis on recognition and management with the aim to increase awareness and improve treatment outcomes.

Keywords: Airway, Dental Emergency, Laryngospasm, Prevention, Protective Reflex, Treatment.

Introduction

Laryngospasm is a rare but life-threatening complication which can be encountered in the dental clinic. Laryngospasm is an involuntary protective mechanism resulting in the closure of the vocal cords to prevent foreign material from entering the airway.[1] Recognition and early intervention are imperative in improving patient outcomes and preventing mortality. Laryngospasm is reported to have an occurrence of 8.7 per 1,000 patients under general anesthesia and is 19 times more likely than bronchospasm.[2]

A dentist's first line of defense is using proper precautions to avoid foreign objects entering the respiratory tract. Common precautions include the use of rubber dams, and throat packs and maintaining adequate suctioning during procedures. While these methods are quite effective they may not always be possible due to physiological or pathologic restrictions and patient compliance. As a result, a possible complication may include vocal cord irritation from blood, oral secretions, or debris entering into the pharynx.[3]

If a foreign object enters the pharynx, the patient may have an involuntary and uncontrolled response of the vocal cords. This involves the vocal cords closing to block the entry of any foreign material into the lower respiratory tract. Laryngospasm involves bilateral adduction of the true vocal folds, vestibular folds, and aryepiglottic folds.[4] This self-defense mechanism can also cause partial or complete obstruction of the airway, resulting in difficulty breathing for the patient, and may become a life-threatening emergency. Untreated laryngospasm may progress to complete airway obstruction, desaturation, bradycardia, and central cyanosis.[5] It is also important to consider risk factors as a part of prevention. Children have a 10-fold increase in risk, therefore, making them

more susceptible to this complications.[6] Other airway abnormalities and gastroesophageal are pre-existing factors that also put a patient more at risk.[6]

Recognition

Identifying a laryngospasm is the first step in management. Symptoms of laryngospasm can be noticed if a patient is having difficulty breathing, difficulty speaking, gasping for air, and hypoxia followed by loss of consciousness. A partial laryngospasm can result in high-pitched "crowing" sounds during inspiration that may quickly progress to a cessation of sounds indicating a complete laryngospasm.[7] Additional signs include increased respiratory effort, suprasternal retraction and paradoxical chest movements, and deoxygenation.[5]

Treatment

Being familiar with the management of these cases can prove to be of vital importance if you are suspected of a laryngospasm. Management of these cases will differ depending on the equipment you have available and the setting you are practicing in. A general dentist will not be able to utilize the same protocols as an oral surgeon and you should use your best judgment for your practice. It is important to have a clear plan of action.[7] After a differential diagnosis to exclude obvious causes of airway obstruction a treatment plan should be quickly put into action.[6]

Initial treatment of laryngospasm classically consists of the following:

Clear Airways

In an emergency situation, it is important to stop treatment and clear the oral cavity of any instruments. Attempt to identify any triggering stimulation such as blood or stomach contents. When possible use suction to clear any foreign material. Be cautious of doing a blind sweep with the finger as this may result in the material becoming dislodged in the respiratory tract.

Regain Oxygenation

Administer 100% oxygen. If O2 levels decrease below 80% this can lead to serious consequences. It is important for general dental offices to have emergency oxygen available for this reason. Supplemental O2 can also be used in many other emergencies related to respiratory and cardiovascular systems.

Maintain airway

It is important to maintain the patient's airway by positioning the head in an upright position with the chin up to open the airway. If the airway is suspected to still be closed a vigorous jaw thrust can be used as part of the initial treatment.[6]

Chest compression

Gentle chest compressions have been reported to assist the treatment of laryngospasms. While there still needs to be additional research in this area one study showed gentle chest compressions with 100% oxygen to be an effective technique in children.[8]

Positive pressure

Attempt positive pressure ventilation via a bag/mask system with a tight-fitting face mask. This may allow some air to pass through into the respiratory system. While doing this it is important to avoid vigorous attempts at ventilation as this may result in inflation of the stomach and lead to diaphragmatic splinting.[6]

Administer medication

In the case of a completely closed glottis then airway maneuvers alone may not be as effective. In this scenario, the next step is to use medication. Succinylcholine is the gold standard for treatment.[7] It is an ideal muscle relaxer due to its rapid onset and short duration of action. A low dose may be administered intravenously, intramuscularly, or sublingual. It is recommended to administer succinylcholine before the oxygen saturation is below 85% to ensure adequate perfusion of the medication.[9] Dosages will depend on the route of delivery as well as the patient.

Some studies suggest the use of 1.0 to 2.0 mg/kg intravenously or 4 mg/kg for the intramuscular route.[7,10]

Follow up

Successful treatment of a laryngospasm includes monitoring the patient after the laryngospasm has resolved. The continuation of ventilation may be assessed on an individual basis to ensure adequate oxygen levels have been obtained.[6] Monitor the patient for 2-3 hours to assess for signs of any adverse effects including post-obstructive pulmonary edema, pulmonary aspiration, or bradycardia. If present, a patient may be referred for further care to a medical clinic or a pulmonologist.

Conclusion

Laryngospasm is a medical emergency that can be managed by a general dentist if they know the appropriate treatment. The aforementioned steps can assist in the management of these cases. A key part of successful management is having the appropriate equipment in the clinic. The inclusion of medication such as Succinylcholine and access to oxygen can be vitally important. Being able to recognize the symptoms and having a clear treatment plan can save lives. It is always recommended to use the best clinical judgment for individual circumstances and treatment plans.

References

1. Rosenberg, M. B., & Lind, L. J. (2002). 17 Deep sedation and general anesthesia. In R. A. Dionne, J. C. Phero, & D. E. Becker (Eds.), Management of pain and anxiety in the Dental Office (pp. 261–280). Saunders. ISBN 978-0-7216-7278-6
2. Beckley, M. L., & Bagheri, S. C. (2014). Chapter 3; Anesthesia. In Clinical Review of Oral and maxillofacial surgery: A case-based approach (second edition) (pp. 65–94). Mosby. ISBN 9780323171267
3. Rex M. A. (1970). A review of the structural and functional basis of laryngospasm and a discussion of the nerve pathways involved in the reflex and its clinical significance in man and animals. British journal of anaesthesia, 42(10), 891–899. https://doi.org/10.1093/bja/42.10.891
4. Cooper, R. M., & Khan, S. (2013). Chapter 50- Extubation and Reintubation of the difficult airway. In C. A. Hagberg (Ed.), Benumof and hagberg's airway management (Third edition) (pp. 1018–1046). doi: https://doi.org/10.1016/B978-1-4377-2764-7.00050-6
5. Lonescu, A. M., & Ved, S. (2014). Laryngospasm. In: Freeman, B. S., Berger, J. eds. Anesthesiology core review: Part One Basic Exam. McGraw-Hill Education Medical. https://accessanesthesiology.mhmedical.com/content.aspx?bookid=974&sectionid=61589165&jumpsectionID=61589178
6. Gavel, G., & Walker, R. W. M. (April 2014). Laryngospasm in Anaesthesia. Continuing Education in Anaesthesia Critical Care & Pain, 14(2), 47–51. https://doi.org/10.1093/bjaceaccp/mkt031
7. Hampson-Evans, D., Morgan P., Farrar M. (2008). Pediatric laryngospasm. Pediatric Anesthesia, 18(4), 303–307. https://doi.org/10.1111/j.1460-9592.2008.02446.x
8. Al-Metwalli, R.R., Mowafi, H.A. & Ismail, S.A. Gentle chest compression relieves extubation laryngospasm in children. J Anesth 24, 854–857 (2010). https://doi.org/10.1007/s00540-010-1036-9
9. Hernández-Cortez, E. (2018). Update on the Management of Laryngospasm. Mexican Federation of Colleges of Anesthesiology AC, 20(2). doi: https://doi.org/10.15406/JACCOA.2018.08.00327
10. Walker RW, Sutton RS. Which port in a storm? Use of suxamethonium without

intravenous access for severe laryngospasm. Anaesthesia. 2007; 62(8):757-759. doi: https://doi.org/10.1111/j.1365-2044.2007.05226.x

Received: 6 February 2023; **Accepted:** 20 March 2023; **Published:** 31 March 2023