ISSN: 2581-5989
PubMed - National Library of Medicine - ID: 101738774

International Journal of Dental Science and Innovative Research (IJDSIR)

IJDSIR : Dental Publication Service

Available Online at: www.ijdsir.com

Volume – 5, Issue – 3, May - 2022, Page No. : 276 - 281

Laser Ablation of Oral Mucocele in Pediatric Patient

[1]Dr. Chetan Aggarwal, Second Year Postgraduate Student, Department of Pedodontics and Preventive Dentistry.

[2]Dr. Pragya Tripathi, Professor, Department of Periodontology.

[3]Dr. Manish Bhalla, Professor and HOD, Department of Pedodontics and Preventive Dentistry.

[4]Dr. Ritika Malhotra, Reader, Department of Pedodontics and Preventive Dentistry.

[5]Dr. Gargi Mohanty, Senior Lecturer, Department of Pedodontics and Preventive Dentistry.

[6]Dr. Swati Tomar, Final Year Postgraduate Student, Department of Pedodontics and Preventive Dentistry.

Corresponding Author: Dr. Chetan Aggarwal, Second Year Postgraduate Student, Department of Pedodontics and Preventive Dentistry.

Citation of this Article: Dr. Chetan Aggarwal, Dr. Pragya Tripathi, Dr. Manish Bhalla, Dr. Ritika Malhotra, Dr. Gargi Mohanty, Dr. Swati Tomar, "Laser Ablation of Oral Mucocele in Pediatric Patient", IJDSIR- May - 2022, Vol. – 5, Issue - 3, P. No. 276 – 281.

Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

Mucocele is a benign lesion characterised by the extravasation or retention of mucous from small salivary glands in submucosal tissue. Mucoceles are most typically found on the lower lip. The most common causes of these lesions are trauma and lip biting habit. Mucocele management is difficult due to the high likelihood of recurrence. The most common treatment for this lesion is traditional surgical removal. Laser ablation, cryosurgery, intralesional corticosteroid injection, micro marsupialization, marsupialization, and electrocautery are some of the other therapy options. This case report highlights how a case of mucocele was successfully treated using laser. For treating mucocele in paediatric patients, diode lasers provide a successful, quick, uncomplicated, bloodless, and well-accepted technique with minimum post-operative discomfort.

Keywords: Mucocele, Diode Laser, Pediatric

Introduction

Histologically, mucoceles are common benign lesions of the oral cavity [1]. The word mucocele is derived from two words i.e., 'muco 'which means mucus and 'coele' means cavity. Based on histopathology, mucoceles are of two types: extravasation mucoceles, which is most common and a retention variant which is rare. The extravasation mucocele is a result of trauma to the duct of minor salivary gland which causes extravasation and accumulation of saliva in the surrounding tissue of lamina propria [2].

Mucoceles are also considered as pseudo-cysts without any epithelial lining because clinically it appear as a

asymptomatic single fluctuant nodule which may be round or oval in shape and deep blue to mucosa-like in colour [1]. Most commonly, mucoceles appear as translucent bluish nodules that arise on the lower labial mucosa but can also be present on other region of oral cavity, rarely. The lesion has no sex predilection [3] and found in any age but most commonly in children and adolescent age group. The diagnosis of mucocele is based on history and histopathological finding [4].

Case Report

A eight year old female patient along with her parents reported to the department of Pedodontics and Preventive Dentistry at Inderprastha Dental College and Hospital (IPDC), Ghaziabad with a chief complaint of painless swelling in the lower right labial mucosa of her lower lips. The father stated that the swelling started two months before and change episodically in size. No relevant medical history or known allergies were reported by parents. The clinical examination revealed a 25mm nodule which is similar in colour to the adjacent oral mucosa in the labial surface on the lower lip opposite to right mandibular permanent lateral incisor. On palpation, the lesion was mobile with soft and elastic consistency. The parents denied any history of trauma or lip biting habit.

Diagnosis

Based upon detailed history and clinical finding, a provisional diagnosis of a superficial mucocele was established.

Figure 1: Pre operative pictures of mucocele in lower labial mucosa of 8-year-old female patient (A & B).

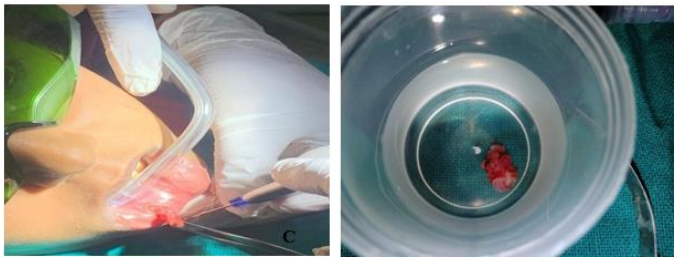

Figure 2: Excision of the lesion using diode laser(C) and excised lesion (D).

Figure 3 : Post operative view – immediate(E) , after 1 week follow up(F) and 1 month follow up(G).

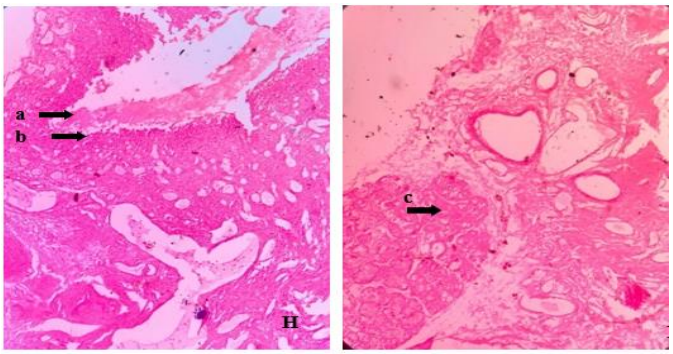

Figure 4: H& E-stained soft tissue section showing the presence of eosinophilic mucinous material (a & b arrow in picture H) surrounded by connective tissue stroma with collagen fibers, fibroblast, lymphocytes and macrophages. In picture 'I' the adjacent section show minor mixed salivary acini along with salivary gland ducts. (Marked with c.)

Management: Conventional and laser treatment options were discussed with parents. The advantages and risk associated with laser treatment were also described before appointment. After medical evaluation, and signed informed consent from the parents; an excisional biopsy using laser was performed under local anesthesia.

A topical anesthetic solution was spray over the site of local infiltration. A local anesthesia containing 2% Lidocaine with 1:100000 ad reline was infiltrate around the periphery of lesion. During the procedure, the patient, the operating paediatric dentist, and the assistant all wore safety laser-specific eye wear. Mucocele excision was performed using a diode laser with a wavelength of 940 nm ± 10nm in continuous mode at a power setting of 2.0Watts (W) (Bio lase EpicX laser, made in USA) using brushing strokes and the mucocele tissue was delicately retracted to one side using a tissue holding forceps. The lesion was removed along with associated minor salivary gland from labial mucosa. To avoid injury of adjacent healthy tissues, the laser beam was kept parallel to the tissue's long axis. In between the procedure, water-moistened gauze was used to prevent the increase in tissues temperature and also to clean tissue debris adhering to laser tip. The duration of treatment was 5-7 minutes during which patient was calm and cooperative. The wound was left open without any sutures after the procedure as there was no bleeding. Only analgesic was prescribed. The excised tissue was send to the Department of Oral Pathology of IPDC for histopathological examination in 10% formalin solution. The histopathological examination showed a cystic structure containing mucinous material surrounded by a wall of connective tissue containing collagen fibers, fibroblast, lymphocytes and macrophages. This histopathology finding confirmed the provisional diagnosis.

Patient was instructed not to eat hot and spicy food for next 24 hours. Patient was prescribed to take analgesic if required and rinse with lukewarm saline water three to four times a day for next 5 days. Parents were instructed to get the child for post operative follow up at 1 week and then after a month for check-up.

Discussion

Oral mucoceles are benign tumours which appear as blisters or lumps anywhere in the mouth where minor salivary glands are present [5]. The most common causes of mucocele are localized trauma and unintentional lip biting which result in rupture of salivary gland ducts and accumulation of mucus in the connective tissue. This event initiates the inflammatory reactions and results in granulation tissue formation [6].

Mucoceles occur most commonly in the lower labial mucosa as investigated by Harrison et al. in 400 patients. [7] Yamasoba et al studied 70 cases of mucoceles in which 75% of lesion were found in the lower labial mucosa [8]. Jimbu et al studied 263 cases, in which 205 (77.9%) occurring on the lower labial mucosa [9]. Nico MM et al conducted a study on paediatric patients and discovered 30 lesions (83.3%) on the lower labial mucosa [10]. The data from scientific studies shows that the incidence of mucoceles are higher during the second decade of life [11]and also common in children [12].

The traditional treatment for mucocele is surgical removal. With the progress in scientific research and development, other options such as laser ablation, cryosurgery, intralesional corticosteroid injection, micro marsupialization, marsupialization, and electrocautery are available for the treatment of mucoceles. [13].

In conventional surgery, removing mucocele along with the involved salivary gland might results in intraoperative haemorrhage, postoperative oedema and sometimes improper flap closure which causes scar formation. The procedure may also affect nearby ducts or acini, leading to recurrence [14, 15].

Minimal invasive technique like micro-marsupialization, which involve the draining of accumulated saliva by placing suture along the largest diameter of lesion and creating a new epithelialized tracts along the path of the

sutures [16], has a lower postoperative complication, and is well-tolerated by pediatric patients as it is done under a topical anaesthesia, but this procedure does not allow to conduct a biopsy and the diagnosis is solely clinical.

Cryosurgery is a non-invasive procedure in which liquid nitrogen or carbon dioxide as freezing agents causes cell death of pathological tissues and eliminates lesions during the healing process [17]. The complications associated with cryosurgery are hyperaemia, swelling, mild pain, and erosion. The procedure takes longer time period to heal than conventional surgical method. The main disadvantage of this method is that the biopsy cannot be done.

Mainly three types of lasers have been used so far for the treatment of mucoceles, which are erbium [1], carbon-dioxide [18] and diode laser.

Carbon dioxide (CO2) laser works on the principle of vaporization and generates lot of heat, which causes carbonization of tissue [19]. Wu et al. in a retrospective study concluded that the relapse was not significantly different between laser and electrosurgery groups [3]. The main disadvantage of CO2 laser vaporisation is the higher cost of the equipment and requires adequate patient and operator protection [19].

Erbium laser are used in treatment of hard and soft tissues. The erbium laser like Er, Cr: YSGG allows precise ablation of mucoceles with minimal damage to biopsy specimen and adjacent mucosal tissues The erbium laser have limited haemostatic effect in compare to diode and $C0_2$ lasers [1].

In dentistry laser diode was introduced in mid 1990s.It work on the principle of photo thermal transmission which result in denaturation, vaporization and carbonization of protein when it come in contact with tissues [20].

Laser ablation is a good option for pediatric patients as it reduces the duration of the procedure, as, pain and time reduction are crucial aspects during therapy, especially for paediatric patients. Treatment of mucocele with laser is a bloodless procedure which causes minimal swelling, scaring and post-operative discomfort to the patient [18, 21].

The use of diode laser for mucocele ablation minimizes the recurrences rate and the complications which are associated with conventional treatment Amaral et al. studied the effect of adding a 660-nm diode laser following micro marsupialization of mucocele. The result showed that there was no infection or relapse in the patients after 6–18 months of follow-up [22].

During the procedure there was no bleeding and the time duration was shorter than surgical procedures. In 2003, Huang et al. reported that the procedure took three to five minutes on average to complete. This makes mucocele laser removal a better option than bladed surgery, especially for children and people who are less cooperative [21].

In present case, after one month follow up, the wound was healed completely which could be because lasers provide cut and coagulation in one time so no bleeding is present during intervention. In addition, no sutures are required at the end of the surgical procedure. In 2015, Pagila et al. published a case of a three-month-old new-born having a mucocele removed with a diode laser. The study concluded that the lesion healed faster in laser ablation than the conventional surgical methods [23].

The main benefits of employing a diode laser, according to the scientific literature, were the shorter process time, better visualisation, patient compliance, less pain, haemostasis and faster healing. [24]

Conclusion

Mucoceles can be removed with diode lasers on paediatric patients as the procedure is of short duration. It is a safe, successful, quick, easy, bloodless, and well-accepted method for treating mucocele in children. The post operative complications are less as compare to the traditional surgical methods.

References

1. Boj JR, Poirier C, Espasa E, Hernandez M, Espanya A. Lower lip mucocele treated with an erbium laser. Pediatr Dent. 2009 May-Jun;31(3):249-52.
2. Yamasoba, N. Tayama, M. Syoji, and M. Fukuta, "Clinic statistical study of lower lip mucoceles," Head and Neck, vol. 12, no. 4, pp. 316–320, 1990.
3. Wu CW, Kao YH, Chen CM, Hsu HJ, Chen CM, Huang IY. Mucoceles of the oral cavity in pediatric patients. Kaohsiung J Med Sci. 2011 Jul;27(7):276-9.
4. H. D. Baurmash, "Mucoceles and ranulas," Journal of Oral and Maxillofacial Surgery, vol. 61, no. 3, pp. 369–378, 2003.
5. Vokurka J, Izakovičová Hollá L, Fassmann A. Erbium Laser in Mucocele Surgery.
6. Li TJ, Kitano M, Yoshida A, Iwashige Y, Yamashita S. Myxoglobulosis in an extravasation mucocele of the lower lip. J Oral Pathol Med 1997; 26:342–4.
7. Harrison JD. Salivary mucoceles. Oral Surg Oral Med Oral Pathol 1975; 39:268–278.
8. Yamasoba T, Tayama N, Syogi M et al. Clinic statistical study of lower lip mucoceles. Head Neck 1990; 12:316–320.
9. Jimbu Y, Kusama M, Itoh H et al. Mucocele of the glands of Blandin-Nuhn: clinical and histopathologic analysis of 26 cases. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2003; 95:467–470
10. Nico MM, Park JH, Lourenco SV. Mucocele in pediatric patients: analysis of 36 children. Pediatr Dermatol. 2008 May-Jun;25(3):308-11
11. More C, Bhavsar K, Varma S, Tailor M (2014) Oral mucocele: a clinical and histopathological study. J Oral Maxillofac Pathol 18(Suppl 1):S72
12. Hayashida AM, Zerbinatti DC, Baiducci I, Cabral LA, Almeida JD. Mucus extravasation and retention phenomena: a 24-year study. BMC Oral Health 2010; 10:15
13. J. Y. Garc´ıa, A. J. E. Tost, L. B. Aytes, and C. G. Escoda, "Treat- ´ ment of oral mucocele—scalpel versus CO2 laser," Medicina Oral Patologia Oral y CirugiaBucal, vol. 14, pp. e469–e474, 2009.
14. Liu JL, Zhang AQ, Jiang LC, Li KY, Liu FZ, Yuan DY, Xu K, Fan QC, Liu XB, Zou B, Meng Z, Feng Y, Zhang B. The efficacy of polidocanol sclerotherapy in mucocele of the minor salivary gland. J Oral Pathol Med. 2018 Oct;47(9):895-899
15. Sinha R, Sarkar S, Khaitan T, Kabiraj A, Maji A. Nonsurgical Management of Oral Mucocele by Intralesional Corticosteroid Therapy. Int J Dent. 2016; 2016:2896748.
16. Piazzetta CM, Torres-Pereira C, Amenabar JM. Micro-marsupialization as an alternative treatment for mucocele in pediatric dentistry. Int J Paediatr Dent. 2012 Sep;22(5):318-23.
17. Farah CS, Savage NW. Cryotherapy for treatment of oral lesions. Aust Dent J 2006; 51:2–5
18. Coluzzi, D.J. Fundamentals of dental lasers: Science and instruments. Dent. Clin. N. Am. 2004, 48, 751–770.
19. Tsunoda N, Kawai T, Obara M, Suzuki S, Miyamoto I, Takeda Y, Yamada H. Analysis of effects and indications of cryosurgery for oral mucoceles. J

Stomatol Oral Maxillofac Surg. 2021 Jun;122(3):267-272.

20. Wu, C.W.; Kao, Y.H.; Chen, C.M.; Hsu, H.J.; Chen, C.M.; Huang, I.Y. Mucoceles of the oral cavity in pediatric patients. Kaohsiung J. Med. Sci. 2011, 27, 276–279.

21. Huang, I.Y.; Chen, C.M.; Kao, Y.H.; Worthington, P. Treatment of mucocele of the lower lip with carbon dioxide laser. J. Oral Maxillofac. Surg. 2007, 65, 855–858

22. Amaral MBF, Freitas IZ, Pretel H et al (2012) Low level laser effect after micro-marsupialization technique in treating ranulas and mucoceles: a case series report. Lasers Med Sci 27:1251–1255

23. Paglia, M.; Crippa, R.; Ferrante, F.; Angiero, F. Mucocele of the minor salivary glands in an infant: Treatment with diode laser. Eur. J. Paediatr. Dent. 2015, 16, 139–142.

24. Ramkumar, S.; Ramkumar, L.; Malathi, N.; Suganya, R. Excision of mucocele using diode laser in lower lip. Case Rep. Dent. 2016, 2016, 1746316.