Case Report

Therapeutic effects of diode laser on vascular epulis in esthetic area

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Abstract:
Vascular epulis is a rare clinical disease. In our study, a case of vascular epulis in the cosmetic area was treated by diode laser, without recurrence and obvious inflammation in the surgical site 5 years after surgery. This case report indicates that the excision of vascular epulis in the cosmetic area of the anterior teeth by diode laser could be an alternatively safe and complementary approach in lieu of conventional surgery.

Key words:
Diode laser, esthetic area, esthetic management, laser surgery, minimally invasive, vascular epulis

INTRODUCTION

Histologically, epulis can be divided into pyogenic granulomas, fibromas, peripheral ossified fibromas, and peripheral giant cell granulomas.[1] The conventional method is to completely remove the involved vascular epulis with a scalpel after local curettage. However, as the conventional method can easily cause hemorrhage and postoperative pain, it is not readily accepted by all patients. Recent studies have found that diode laser can be used for the removal of soft tissue hyperplasia in the mouth, with the advantage of reducing hemorrhage and pain and correcting frenulum labialis.[2–4] So far, there is no report on the effect of diode laser on the resection of vascular epulis. Our findings indicate that diode laser therapy could achieve good clinical effect in the treatment of vascular epulis.

CASE REPORT

A 19-year-old Chinese girl came to the Department of Periodontology, Oral Center of the Affiliated First Hospital of Second Military Medical University, for the evaluation of localized gingival hyperplasia in the right maxillary incisor area. The patient complained that her gum started to overgrow about a year ago and caused discomfort when brushing. As a nonsmoker, she had no history of systemic diseases and allergies. Clinical examination showed that there was an excessive growth in the purple round gums with a diameter of 11 mm between tooth 11 and 12, covering most of the crowns, but without significant absorption of the alveolar bone in the affected area [Figure 1a and b].

On the day of surgery (and after signing the informed consent), the patient received 0.12% chlorhexidine mouthwash. Then, following local anesthesia with 2% articaine and epinephrine at 1:100,000, vascular epulis was completely removed by diode laser without obvious hemorrhage (Pilot™, USA). The vascular epulis was resected by continuous mode wave during the surgery, and the output power was set at 2.0 W and the wavelength at 810 nm. The patient was instructed to brush the surgical area with a soft-haired toothbrush and gargle with 0.12% chlorhexidine mouthwash daily for at least 2 weeks.

The wound healed 10 days after laser therapy [Figure 1c]. Although chronic gingival inflammation occurred between tooth 11 and 21, there was no significant gingival inflammation at the surgical site 5 years later [Figure 1d]. Hematoxylin and eosin staining showed that there were large numbers of thin-walled vascular hyperplasia and dilatation in the gingival lamina propria and vessels of varying sizes in the proliferative fibrous tissue, and large quantities of red blood cells in the blood vessels were lined with flat vascular endothelial cells [Figure 2a and b]. Immunohistochemical staining showed that expression of CD31 was positive and that of CD34 was strongly positive in the vascular endothelial cells [Figure 2c and d].

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How to cite this article: Chen TL, Wang XM, Zhang XH, Chen J, Liu J. Therapeutic effects of diode laser on vascular epulis in esthetic area. J Indian Soc Periodontol 2021;25:75-7.
Typical vascular epulis is rare in clinic, and conventional treatment is to completely remove the lesion to avoid recurrence. However, as vascular epulis is rich in the blood vessels, surgical resection may result in significant hemorrhage. Our study is a case of typical vascular epulis in the esthetic area of the anterior teeth, resected by diode laser, and a 5-year medical follow-up showed that good therapeutic effect was achieved.

Plachouri and Georgiou reported that the recurrence rate was 16%–20% after conservative surgical resection of epulis. To reduce postoperative recurrence, dentists usually enlarged the scope of surgery. However, enlarged resection for the removal of vascular epulis in the anterior teeth might lead to various esthetic problems of root exposure, dentin sensitivity, and abnormal gingival morphology. Therefore, finding effective approaches to solve these problems has always been a concern of periodontists.

Recently, Boj et al. have demonstrated that laser could successfully treat oral papilloma, oral and maxillofacial granulomatosis, and gingival melanin deposition. In addition, laser is a safe and effective alternative to conventional crown lengthening. Studies have also shown that laser surgery could reduce the dosage of anesthetics and surgical time and significantly lower the pain scores of patients as well. Isola et al. found that laser could promote wound healing and reduce scar formation, and the wound healing rate of the laser group (82%) was higher than that of the conventional surgical group (59%). Diode laser combined with Nd: YAG was more effective in the treatment of oral soft tissue illness. CO laser could promote wound healing after drug-induced gingival overgrowth resection.

In addition, laser can achieve a certain antibacterial effect on periodontitis. For instance, laser combined with mechanical debridement can significantly improve the level of clinical attachment and inhibit microbial growth. Photodynamic therapy, as an adjunctive treatment for periodontitis, can significantly reduce periodontal attachment loss and periodontal pocket depth and decrease the levels of IL-1β and IL-17 in the gingival crevicular fluid.

Clinically, soft tissue is resected by means of a continuous mode diode laser at the wavelengths of 800–980 nm, while Hasanoglu Erbasar et al. have removed drug-induced gingival hyperplasia with diode laser at 808 nm (1.5 W) to achieve satisfactory effects. In our study, the vascular epulis was removed with diode laser at 810 nm (2.0 W), and the surgical time was obviously shorter than that of conventional methods.

In spite of low thermal effect of laser therapy, long surgical time with high output power will increase the temperature of the target tissue, resulting in tissue damage. Therefore, the output power and surgical time should be strictly controlled to prevent tissue necrosis.

Nevertheless, due to limited case report and the restriction of author’s practice, diode laser as a technique for efficient resection of vascular epulis requires further study so that it could be better applied clinically in the esthetic field of anterior teeth, especially for those patients who fear invasive surgery.

Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.
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