

EVALUATION OF THE EFFICACY OF CONVENTIONAL SURGERY IN THE MANAGEMENT OF EPULIS FISSURATUM LESIONS RARELY ENCOUNTERED ON THE LINGUAL ASPECT OF THE ALVEOLAR CREST

Alper Sindel, DDS, PhD

Assistant Professor, Department of Oral and Maxillofacial Surgery,
Faculty of Dentistry, Akdeniz University,
Antalya, Turkey.

Mehmet Ali Altay, DDS, PhD

Assistant Professor, Department of Oral and Maxillofacial Surgery,
Faculty of Dentistry, Akdeniz University,
Antalya, Turkey

Mehmet Mustafa Özarslan, DDS, PhD

Assistant Professor, Department of Prosthodontics,
Faculty of Dentistry, Akdeniz University,
Antalya, Turkey

Hüseyin Alican Tezerişener, DDS

Research Assistant, Department of Oral and Maxillofacial Surgery,
Faculty of Dentistry, Akdeniz University,
Antalya, Turkey

Öznur Özalp, DDS

Research Assistant, Department of Oral and Maxillofacial Surgery,
Faculty of Dentistry, Akdeniz University,
Antalya, Turkey

Correspondence

Alper Sindel, DDS, PhD

Department of Oral and Maxillofacial Surgery,
Faculty of Dentistry, Akdeniz University,
07058, Konyaalti, Antalya, Turkey.
Phone: +90 242 2274400 / 2917
Fax: +90 242 310 69 67
E-mail: dtalpersindel@gmail.com

ABSTRACT

Background and Aim: Epulis fissuratum (EF) is the fibrous hyperplasia of connective tissue that arises from chronic irritation of a poorly-adapted prosthesis, and typically appears in the alveolar vestibule. When it occurs on the lingual aspect of the alveolar crest, surgical excision of EF may be challenging due to possible relation of the lesion with important vital structures. The aim of this study is to evaluate and report on the efficacy of conventional surgery in the management of EF lesions rarely located on the lingual aspect of the alveolus.

Subjects and Methods: A retrospective study was conducted on 8 patients requiring removal of 9 EF lesions on the lingual surface of the alveolar crest. EF lesions were excised using conventional scalpel surgery. The assessment of surgical outcomes focusing on wound healing and depth of the floor of the mouth was carried out using patient follow-up records on post-operative 7th, 30th and 90th days.

Results: None of the patients complained of symptoms related to lingual nerve and/or submandibular duct injury. The depth of the floor of the mouth was maintained at pre-operative values for all patients included in the study. In a single patient, comparison of the surgical outcome and pre-operative state was not possible due to bilateral nature of the EF lesions.

Conclusion: Being an approach that was found to be effective and safe, conventional scalpel excision may be the treatment of choice for removal of EF lesions on the lingual aspect of the alveolar crest.

Clin Dent Res 2017; 41(3): 124-131

Keywords: Epulis Fissuratum, Hyperplasia, Lingual Epulis, Mouth Floor, Oral Surgery

Submitted for Publication: 03.02.2017

Accepted for Publication : 10.30.2017

ALVEOLER KRETİN LİNGUAL YÜZEYİNDE NADİREN İZLENEN EPULİS FİSSURATUM LEZYONLARINDA KONVANSİYONEL CERRAHİNİN ETKİNLİĞİNİN DEĞERLENDİRİLMESİ

Alper Sindel

Yrd. Doç. Dr., Akdeniz Üniversitesi, Diş Hekimliği Fakültesi, Ağız,
Diş ve Çene Cerrahisi Anabilim Dalı,
Antalya, Türkiye

Mehmet Ali Altay

Yrd. Doç. Dr., Akdeniz Üniversitesi, Diş Hekimliği Fakültesi,
Ağız, Diş ve Çene Cerrahisi Anabilim Dalı,
Antalya, Türkiye

Mehmet Mustafa Özarslan

Yrd. Doç. Dr., Akdeniz Üniversitesi, Diş Hekimliği Fakültesi,
Protetik Diş Tedavisi Anabilim Dalı,
Antalya, Türkiye

Hüseyin Alican Tezerişener

Arş. Gör. Dt., Akdeniz Üniversitesi, Diş Hekimliği Fakültesi,
Ağız, Diş ve Çene Cerrahisi Anabilim Dalı,
Antalya, Türkiye

Öznur Özalp

Arş. Gör. Dt., Akdeniz Üniversitesi, Diş Hekimliği Fakültesi,
Ağız, Diş ve Çene Cerrahisi Anabilim Dalı,
Antalya, Türkiye

Sorumlu Yazar

Alper SİNDEL

Akdeniz Üniversitesi, Diş Hekimliği Fakültesi,
Ağız, Diş ve Çene Cerrahisi Anabilim Dalı,
07058, Konyaaltı, Antalya, Türkiye.
Telefon: +90 242 2274400 / 2917
Faks: +90 242 310 69 67
E-mail: dtalpersindel@gmail.com

ÖZ

Amaç: Epulis fissuratum (EF), adaptasyonu zayıf protezlerin neden olduğu kronik irritasyona sonucu meydana gelen, bağ dokunun fibröz hiperplazisidir ve genellikle alveoler vestibülde lokalizedir. Alveoler kretin lingual yüzeyinde görülen EF lezyonlarının cerrahi eksizyonu, lezyonun önemli vital yapılarla ilişkili olabilmesi nedeniyle bir takım zorluklar içerebilmektedir. Bu çalışmanın amacı, alveoler kretin lingual yüzeyinde nadiren izlenen EF lezyonlarının tedavisinde, konvansiyonel cerrahinin etkinliğini değerlendirmek ve bildirmektir.

Bireyler ve Yöntem: Bu retrospektif çalışmada, alveoler kretin lingual yüzeyinde yerleşimli 9 adet EF lezyonunun cerrahi tedavisini gerektiren 8 hasta yer almaktadır. EF lezyonlarının tümü konvansiyonel bistüri cerrahisi ile eksize edilmiştir. Operasyon sonrası 7., 30. ve 90. günlerde alınmış hasta kayıtları aracılığıyla, yara iyileşmesi ve ağız tabanı derinliği incelenerek gerçekleştirilen cerrahinin sonuçları değerlendirilmiştir.

Bulgular: Hastaların hiçbirisi, lingual sinir ve/veya submandibuler kanal hasarı ile ilişkili olabilecek bir semptom bildirmemiştir. Çalışmaya dahil edilen hastaların tümünde pre-operatif olarak ölçülen ağız tabanı derinliği değerlerinin operasyon sonrası dönemde korunduğu gözlenmiştir. Yalnızca bir hastada, çift taraflı EF lezyonu bulunması nedeniyle, operasyon öncesi durum ile cerrahi girişimin sonuçları karşılaştırılamamıştır.

Sonuç: Bu çalışmanın sonuçlarına göre, etkili ve güvenli bir yaklaşım olduğu belirlenen konvansiyonel bistüri eksizyonu, alveoler kretin lingual yüzeyinde izlenen EF lezyonlarında tercih edilecek tedavi yöntemi olarak düşünülebilir.

Clin Dent Res 2017; 41(3): 124-131

Anahtar Kelimeler: Ağız Tabanı, Epulis Fissuratum, Hiperplazi, Lingual Epulis, Oral Cerrahi

Yayın Başvuru Tarihi : 02.03.2017

Yayına Kabul Tarihi : 30.10.2017

INTRODUCTION

Oral mucosa is frequently exposed to internal and external irritations leading to a wide range of oral mucosal diseases from developmental, reactive and inflammatory to neoplastic lesions.¹ Reactive lesions clinically present as benign nodular swellings developing in relation with chronic, low-degree tissue injury.² Pyogenic granuloma, epulis fissuratum, peripheral giant cell granuloma, fibroepithelial polyp, peripheral ossifying fibroma and pregnancy epulis are among the most commonly encountered reactive lesions of the oral mucosa.^{2,3}

Epulis fissuratum (EF) is defined as the fibrous hyperplasia of connective tissue that arises from chronic, low-grade irritation of a poorly-adapted prosthesis.⁴ It typically appears as a single or multiple folds of hyperplastic tissue in the alveolar vestibule and the degree of hyperplasia and hypertrophy may vary considerably.⁴ Although the lesion commonly appears firm and fibrous, erythematous and ulcerated appearance may also be observed depending on the duration and severity of the trauma.⁵ The most frequently affected region is the anterior maxilla⁶, and the incidence is reported to be higher in between 5th and 6th decades and in women.⁷

The differential diagnosis of EF includes malignancies such as squamous cell carcinoma, malignant tumor of salivary glands, metastatic tumors and Crohn's disease. EF may remain asymptomatic or lead to pain and discomfort and hinder the mastication.⁸ Furthermore, EF may transform into a malignant lesion over time; therefore, immediate removal of EF lesions is indicated.⁴ Treatment alternatives of EF include conservative treatment, conventional scalpel excision, electrosurgical scalpel excision, cryotherapy and excision with soft tissue lasers. Among these, conventional scalpel excision is frequently preferred by clinicians due to advantages of accuracy and precision, as well as minimal tissue injury.⁹

To date, management of EF lesions on common locations has been subject to a number of studies.^{4,8,10,11} However, there is only limited information in the current literature, on the management of EF lesions located on the lingual aspect of the alveolar crest, which remains inadequate to draw conclusions. The present study aims to evaluate and report on the safety and efficacy of the removal of EF lesions rarely located on the lingual aspect of the alveolar crest, using conventional scalpel surgery.

SUBJECTS AND METHODS

This retrospective study evaluated data collected from patient follow-up records of the Department of Oral and Maxillofacial Surgery, Faculty of Dentistry at Akdeniz University between January 2013 and December 2016. The Declaration of Helsinki on medical protocol and ethics was followed and Clinical Researches Ethics Committee of Akdeniz University approved the study.

The study population consisted of 8 patients who underwent removal of 9 EF lesions using conventional scalpel surgery. All patients were totally edentulous and had fibrous hyperplastic lesions located on lingual surface of the alveolar crest requiring removal to allow for a stable prosthesis (Figure 1).

Surgical Protocol

All patients were advised not to wear their dentures for seven days prior to surgical removal to reduce inflammation on tissues. The depth of the floor of the mouth was measured pre-operatively on the contralateral side to allow for comparison of the outcomes (Figure 2). Under local anesthesia, excision of EF lesions were performed using a scalpel within the surgical margins, which were determined pre-operatively (Figure 3). Particular attention was paid to protect the lingual nerve and salivary gland ducts as well as their orifices located in close proximity on the floor of the mouth. Following total excision of the lesion, bleeding control was achieved by compression without further need



Figure 1. Epulis fissuratum lesion is observed on the lingual surface of the alveolar crest.

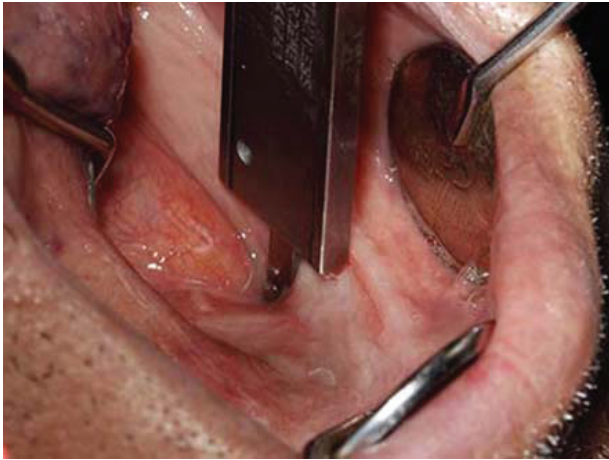


Figure 2. Measurement of depth of the floor of the mouth in a patient

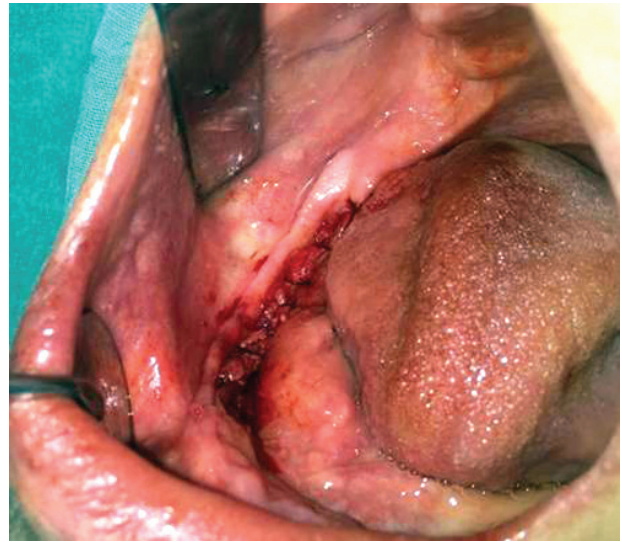


Figure 4. Primary closure was performed following the excision of the lesion.

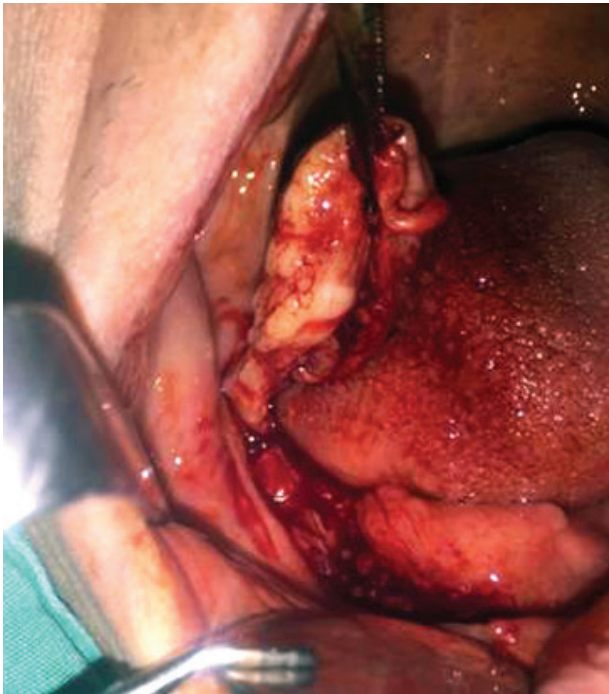


Figure 3. Total excision of the lesion was performed using conventional scalpel surgery.



Figure 5. Specimens were sent to histopathological examination for the confirmation of the diagnosis.

of additional hemostatic agents, and primary closure was performed with interrupted sutures (Figure 4). All specimens obtained from the patients were sent for histopathological examination to confirm the diagnosis (Figure 5).

All patients were recommended to rinse with a chlorhexidine 0.2% mouthwash starting on the second day after surgery,

and three times a day during the post-operative first week. Amoxicillin - clavulanic acid (1000 mg, 2x1) and paracetamol (500mg, 2x1) were prescribed to for 5-7 days. The patients were kept on a soft diet for the first 72 hours following the operation.

Post-operative controls were performed on days 7, 30 and 90, and the assessment of wound healing as well as measurement of the depth of the floor of the mouth were performed (Table 1). Once the re-epithelialization of surgical sites was achieved, the patients were referred for prosthetic rehabilitation. The patients were followed up for a period ranging from 1 to 3 years.

Table 1. Patient demographics and pre-operative/post-operative measurements of depth of the floor of the mouth

Depth of the Floor of the Mouth(mm)						
Patients	Gender	Age	Pre-operative	Post-operative 7 th day	Post-operative 30 th day	Post-operative 90 th day
1	F	68	10	7	9	10
2	F	83	8	6	7	8
3	F	54	12	9	12	12
4	F	60	9	9	9	9
5	M	49	8	5	6	8
6	M	70	13	8	12	13
7 †	M	62	11	5	8	8
8	F	65	NA	10	12	13

*F: Female, M: Male, NA: Not available, †: The patient who had second surgery

RESULTS

A total of 8 patients (5 females and 3 males) with a mean age of 63.9 (ranging between 49 and 83) were enrolled in this study (Table 1). In one of the patients, total excision of the EF lesion could not be achieved to avoid damage to the orifices of the neighboring salivary glands (Figure 6). Therefore, a two-staged surgery was planned and performed for complete excision of the lesion (Figure 7). In two patients, there was no residual supportive tissue on the buccal aspect of the alveolar crest for conventional total prostheses, therefore, implant-supported overdentures were planned to be performed.

An uneventful healing was observed in all patients without signs of infection or other complications (Figure 8). None of the patients complained of symptoms related to lingual nerve and/or submandibular duct injury (i.e. xerostomia) and no recurrence was observed during the follow-up period.

The mean depth of the floor of the mouth on the affected side was found to be 10.1 mm pre-operatively (ranging from 8 mm to 13 mm) (Table 1). On the post-operative 7th and 30th days, the mean depth of the floor of the mouth decreased to 7.3 mm and 9.3 mm, respectively (Table 1). By the end of the third month, the mean value of the floor of the mouth on the affected site was found to have increased to its pre-operative value of 10.1 mm (Figure 9). In a single patient, comparison of the surgical outcome and pre-operative state

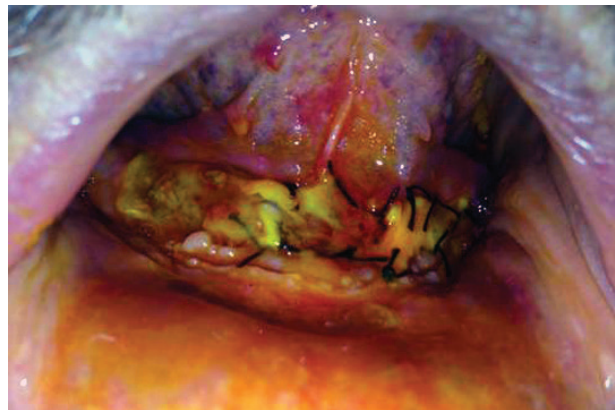


Figure 6. Wound healing in the patient who underwent two-stage surgical removal of the EF lesion. Intraoral view one week after first surgery.

was not possible due to bilateral nature of the EF lesions. This patient however, was also able to host a stable removal prosthesis following healing of the surgical sites.

DISCUSSION

Various treatment protocols are defined for the management of EF lesions.⁹ The size and site of the lesion are among the most important factors that need to be taken into consideration, when choosing the optimal approach to avoid post-operative complications. Commonly, small lesions consisting of inflamed tissue resolve solely by elimination of the chronic trauma without the need of further treatment.



Figure 7. Wound healing in the patient who underwent two-stage surgical removal of the EF lesion. Intraoral view one week after second surgery.



Figure 8. An intraoral view on the post-operative 30th day. Satisfactory healing is observed in the surgical site.

However, this approach is safe and efficient for only a limited number of cases, and may remain ineffective in cases where persistent or refractory EF lesions of a large size are encountered.¹²

Electrosurgical scalpels may be used for excision of EF lesions with advantages of promptness, haemorrhage control, and sterile incision.⁴ However, they are also reported to increase osteoclastic activity when used in close proximity to periosteum and delay wound healing.¹³ Additionally, the use of this instrument is contraindicated in presence of intraoral

metallic elements to avoid pulp necrosis of the teeth in the treatment zone¹⁴, and in patients with certain types of pacemakers.⁴ Furthermore, electrosurgery may result in excessive scar formation, particularly when removing large lesions located, where the primary closure of the wound site is a concern for the clinician.¹⁵

Soft tissue lasers have also been recommended as an alternative for surgical removal of EF lesions, due to previously reported advantages of improved hemostasis, sterilization of the surgical field, less edema, reduced pain, minimum scarring, and less requirement of local anesthesia.^{16,17} However, a review of the current literature reveals controversial findings on the use of lasers in surgical removal of EF lesions. In a study by Karimi et al.¹⁸, CO₂ laser was reported to aid in achieving less bleeding, reduced duration of surgery and higher vestibular depth, whereas wound healing was observed to be significantly better with conventional scalpel surgery. Conversely, Fisher et al.¹⁹ reported reduction in vestibular depth following surgical removal of fibro-epithelial hyperplasia with CO₂ laser. In another study comparing the clinical outcomes following surgical removal of EF lesions using conventional scalpel and the Erbium, Chromium:Yttrium-Scandium-Gallium-Garnet (Er,Cr:YSGG) laser, Eroglu et al.²⁰ reported no statistically significant difference between two groups with regard to wound healing and pain. Furthermore, disadvantages of laser surgery including thermal damage to collateral tissues²¹ and the high cost of the required equipment hinders the use of soft tissue lasers in the removal of hyperplastic lesions of the oral cavity.²⁰

Recently, cryosurgery has also been suggested as an effective treatment alternative for the management of EF lesions.⁹ However, there is lack of published information on the outcomes of studies utilizing cryosurgery for removal of these lesions. In the only case report by Vyasarayani et al.⁸, where the removal of an EF lesion was carried out using cryosurgery, the authors reported favorable outcomes on hemostasis and post-operative healing. However, requirement of special equipments, cost of treatment and being not applicable for lesions larger than 3.5 cm in size due to currently available probe diameters are among the limitations of cryosurgery applications in the oral cavity.²² Lingually located EF is a rare condition, where the surgical management may be challenging due to anatomical considerations and close proximity to important vital

structures. Trauma to these structures may result in serious complications including ranula formation, nerve injuries and life-threatening haemorrhage.^{23,24} In the present study, satisfactory outcomes were achieved following excision of lingually located EF lesions using conventional scalpel surgery.

CONCLUSION

Being an approach that was found to be reliable, effective and safe, conventional scalpel excision may be the treatment of choice for removal of EF lesions located on the lingual aspect of the alveolar crest, without causing a decrease in the depth of the floor of the mouth. Clinicians however, are advised to keep in mind the anatomical considerations and strongly adhere to surgical principles of wound healing in order to obtain favorable outcomes, when removing EF lesions encountered in this rare location

REFERENCES

1. Scott JH, Symons NBB, editors. Introduction to dental anatomy. 5th ed. Edinburgh and London: E. & S. Livingstone; 1967.
2. Shenoy S, Dinkar A. Pyogenic granuloma associated with bone loss in an eight year old child: A case report. *J Indian Soc Pedod Prev Dent* 2006; 24: 201.
3. Rivera C, Droguett D, Arenas-Márquez M-J. Oral mucosal lesions in a Chilean elderly population: A retrospective study with a systematic review from thirteen countries. *J Clin Exp Dent* 2017; 9:e276-e283.
4. Tamarit-Borras M, Delgado-Molina E, Berini-Aytés L, Gay-Escoda C. Removal of hyperplastic lesions of the oral cavity. A retrospective study of 128 cases. *Med Oral Patol Oral Cir Bucal* 2004; 10: 151-162.
5. Starshak TJ, Sanders B, editors. Preprosthetic oral and maxillofacial surgery. St. Louis: Mosby; 1980.
6. Wood NK, Goaz PW. editors. Differential diagnosis of oral lesions. 3rd ed. St. Louis: Mosby; 1985.
7. Neville BW, Damm DD, Allen MA, editors. Oral and Maxillofacial Pathology. 3rd ed. New York: W B Saunders; 2008.
8. Vyasrayani P, Madhumietha A, Gundlapalle P. Management of geriatric patient with epulis fissuratum using liquid nitrogen cryosurgery: a case report. *J Indian Prosthodont Soc* 2014; 14: 115-119.
9. Ryu SW, Lee SH, Yoon HJ. A comparative histological and immunohistochemical study of wound healing following incision with a scalpel, CO2 laser or Er,Cr:YSGG laser in the guinea pig oral mucosa. *Acta Odontol Scand* 2012; 70: 448-54.
10. Monteiro LS, Mouzinho J, Azevedo A, Câmara MI, Martins MA, La Fuente JM. Treatment of epulis fissuratum with carbon dioxide laser in a patient with antithrombotic medication. *Braz Dent J* 2012; 23: 77-81.
11. Niccoli-Filho W, Neves ACC, Penna LAP, Seraidarian PI, Riva R. Removal of epulis fissuratum associated to vestibuloplasty with carbon dioxide laser. *Lasers Med Sci* 1999; 14: 203-206.
12. American Prosthodontic Society. The glossary of prosthodontic terms. *J Prosthet Dent* 2005; 94: 10-92.
13. Nixon KC, Adkins KF, Keys DW. Histological evaluation of effects produced in alveolar bone following gingival incision with an electrosurgical scalpel. *J Periodontol* 1975; 46: 40-44.
14. Convisan RA, Diamond LB, Fazekas CDL. Laser treatment of orthodontically induced gingival hyperplasia. *Gen Dent* 1996; 44: 47-51.
15. Tucker MR. Cirurgia Pré-Protética Básica. In: Peterson LJ, Ellis III E, Hupp JR, Tucker MR, editors. Cirurgia Oral e Maxilofacial Contemporânea. 3ª ed. Rio de Janeiro: Guanabara Koogan; 1998. p.263-298.
16. Cobb CM. Lasers in periodontics: a review of the literature. *J Periodontol* 2006; 77: 545-564.
17. Wigdor HA, Walsh JT Jr, Featherstone JD, Visuri SR, Fried D, Waldvogel JL. Lasers in dentistry. *Lasers Surg Med* 1995; 16: 103-133.
18. Karimi A, Sobouti F, Torabi S, Bakhshandehfard A, Amirian A, Shariati M et al. Comparison of Carbon Dioxide Laser With Surgical Blade for Removal of Epulis Fissuratum. A Randomized Clinical Trial. *J Lasers Med Sci* 2016; 7: 201-204.
19. Fisher SE, Frame JW. The effects of the carbon dioxide surgical laser on oral tissues. *Br J Oral Maxillofac Surg* 1984; 22: 414-425.
20. Eroglu CN, Tunç SK, Elasan S. Removal of epulis fissuratum by Er,Cr:YSGG laser in comparison with the conventional method. *Photomed Laser Surg* 2015; 33: 533-539.
21. Cercadillo-Ibarguren I, Espan˜a-Tost A, Arnabat-Domínguez J, Valmaseda-Castellón E, Berini-Aytes L, Gay-Escoda C. Histologic evaluation of thermal damage produced on soft tissues by CO2, Er, Cr:YSGG and diode lasers. *Med Oral Patol Oral Cir Bucal* 2010; 15: e912-918.
22. Kutluay H, Çankal DA, Bozkaya S. Kriyocerrahi ve ağız cerrahisinde kullanım alanları. *Acta Odontologica Turcica* 2010; 27: 53.

23. Raj AA, Shetty PM, Yadav SK. Lipoma of the floor of the mouth: Report of an unusually large lesion. *J Maxillofac Oral Surg* 2014; 13: 328-331.
24. Givol N, Chaushu G, Halamish-Shani T, Taicher S. Emergency tracheostomy following life-threatening hemorrhage in the floor of the mouth during immediate implant placement in the mandibular canine region. *J Periodontol* 2000; 71: 1893-1895.