

CO₂ Laser Surgery of Obstructive Fibroma in the Oropharyngeal Cavity

Walter Niccoli-Filho^a, Aline Rose Cantarelli Morosolli^b, Michelle Bianchi^b

^a Head, Academic Group of Studies and Research with Laser in Dentistry, São Paulo State University, UNESP, School of Dentistry, São Jose dos Campos, SP, Brazil.

^b Postdoctoral Research Fellow, Academic Group of Studies and Research with Laser in Dentistry, São Paulo State University, UNESP, School of Dentistry, São Jose dos Campos, SP, Brazil.

Abstract: Fibroma is the most common tumor of the oral cavity. This lesion is a hyperplastic proliferation of the oral mucosa and classified as a reactive tumor of fibrous connective tissue. Trauma or irritation from dentures, restorations, or subgingival calculus, cheek biting and suction habits may be factors causing irritation fibroma. The lesion is usually asymptomatic unless secondarily traumatized and ulcerated. Irritation fibroma is treated by surgical excision; additionally, the source of irritation and trauma must be eliminated. In this study, we present a clinical case of bilateral fibroma, the large dimensions of which produced a serious functional impairment, and which was removed using CO₂ laser irradiation (0.8 mm focus, 5 W, power density 2.5 W/cm²). The functional and esthetic results suggest that the use of the laser irradiation is a choice to be considered, as it provides a comfortable postoperative period with less edema and no hemorrhaging. Furthermore, it allows the use of a prosthesis immediately after surgery, without the mechanical trauma caused by the suture when placed under pressure by the prosthesis.

Key words: fibroma, hyperplastic proliferation, laser, carbon dioxide laser, oral surgery.

J Oral Laser Applications 2005; 5: 103-105.

Irritation or traumatic fibroma is the most common tumor of the oral cavity. This lesion is a hyperplastic (not neoplastic) proliferation of the oral mucosa and classified as a reactive tumor of fibrous connective tissue. Buccal mucosa is the most common location for development of fibroma; however, it can occur anywhere in the mouth. Trauma or irritation from dentures, restorations, or subgingival calculus, cheek biting, and suction habits may be factors causing irritation fibroma. The lesion clinically appears as a smooth-surfaced exophytic tumor that is similar in color to the surrounding normal mucosal tissue. Occasionally, the surface epithelium may be white and hyperkeratinized. If the lesion is not removed surgically in early phase of its development, it can enlarge and become a massive

tumor. The lesion is usually asymptomatic unless secondarily traumatized and ulcerated. Irritation fibroma is treated by surgical excision, but the source of irritation and trauma must also be eliminated.

Conservative excisional biopsy is curative and its findings are diagnostic; however, recurrence is possible if the exposure to the offending irritant persists.¹ The bony concavity associated with some leaf-shaped fibroma under dentures will recontour to normal after removal of the offending mass.

With the advent of CO₂ surgical laser for intraoral surgery, the successful surgical control of fibroma, especially when large areas are involved, has been improved. This kind of radiation has several advantages when compared with the conventional surgical tech-



Fig 1 Preoperative view of bilateral fibroma.

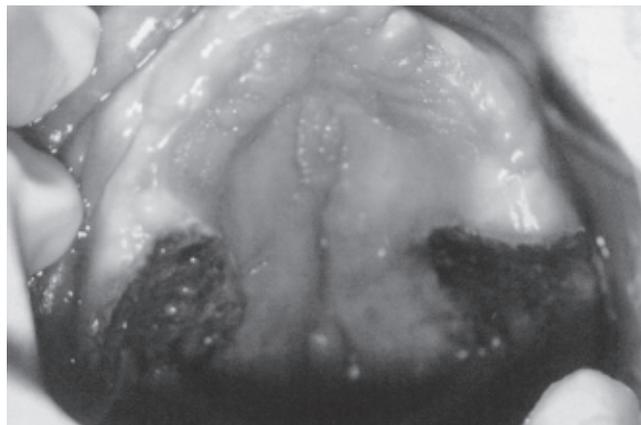


Fig 2 Clinical aspect immediately after irradiation.

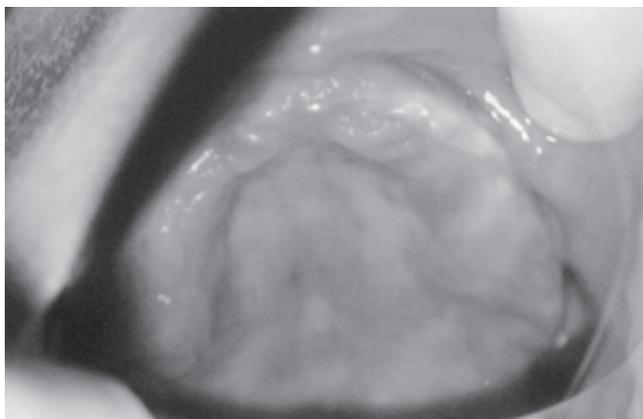


Fig 3 Clinical aspect after 30 days.

niques, among them: hemostatic effect, reduction of the pain and postoperative edema, sterilization of the surgical wound in the moment of laser application, no need to suture, immediate replacement of the prosthesis, and minimum damage to the adjacent tissues.^{2,3}

In this study, we present a clinical case of bilateral fibroma, the large dimensions of which produced a serious functional impairment, and which was removed through carbon dioxide (CO₂) laser irradiation.

CASE REPORT

A 57-year-old female Caucasian patient was evaluated at the Department of Biosciences and Oral Diagnosis at São Paulo State University, showing a progressive increase in volume of the soft palatal and pharyngeal tis-

ues after the use of a maxillary total prosthesis. The patient also reported difficulty eating, speaking, and breathing, and complained of swelling, palatal pain, and halitosis. In the clinical examination, we observed a bilateral hypertrophy in the soft palate area, with a large, hardened mass of insertion in both alveolar tubercula invading the oropharynx. Where the two masses met, a small line showed clinical aspects of chronic inflammation and impacted food remains (Fig 1). All other buccal structures appeared normal. After careful planning, the hypertrophy was delimited and local anesthesia was achieved through infiltration in areas adjacent to the lesion to be removed. A CO₂ laser in continuous mode was used for dissection and removal (Sharplan Lasers, Tel Aviv, Israel, FAPESP 97/07645-2), with 0.8 mm focus, 5 W, power density of 2.5 W/cm², and constant vacuum removal of the smoke plume (Surgifresh, Surgimedics, Woodlands, TX, USA). No suture was placed (Fig 2). The patient, surgeon, and team were protected with laser safety glasses and masks. Intact tumor-tissue specimens were submitted to anatomical and histopathological examinations.

Immediately after surgery, the maxillary prosthesis was relined with resilient autopolymerizable resin (Eversoft, Myerson, Austenal, London, UK).

Clinical follow-up evaluations were conducted every 7 days until 2 months after surgery. After 30 days, restitutio ad integrum of mucosa was observed with a very satisfactory functional result (Fig 3). The histopathological result showed a classic fibroma tissue with no signs of malignancy.

DISCUSSION

Sixty-six percent of irritation fibromas are found in females. They can occur at any age, but are usually diagnosed in the fourth through sixth decades of life. It is extremely rare during the first decade of life. Patients with multiple fibromas may represent cases of familial fibromatosis, fibrotic papillary hyperplasia of the palate, tuberous sclerosis, or multiple hamartoma syndromes (Cowden syndrome).⁴ Those with a generalized fibrous overgrowth of the gingival tissues are said to have fibrous gingival hyperplasia or gingival fibromatosis.⁴

Within the mouth, buccal, labial and lateral tongue sites account for 71% of all fibromas. The mass may be sessile or pedunculated and usually reaches its maximum size within a few months. Seldom does it exceed 1.5 cm in size, and once fully formed, it remains indefinitely. It is an asymptomatic, moderately firm, immovable mass with a surface coloration that is most often normal, but may show pallor from decreased vascularity, whiteness from thickened surface keratin, or ulceration from recurring trauma. A fibroma beneath a denture has no space to expand uniformly in all directions, and so develops as a flat, pancake-shaped mass with small surface papules along the outer edges. This leaf-shaped fibroma may be associated with an underlying cupped-out area of bony erosion.⁴

CO₂ laser radiation is an excellent, simple, and safe form of treatment of oral lesions. This procedure is virtually bloodless, and postoperative edema and discomfort are minimal.^{3,5} With laser irradiation, there is less damage to adjacent tissues and better visibility. Initially, a coagulum of denatured protein forms on the surface.⁵ Compared to conventional methods, CO₂ laser surgery is less time consuming, less painful, more precise in the treatment of soft tissue lesions, produces less scar-tissue contraction, and maintains the elastic tissue properties. All of this allows an excellent prognosis when large areas needing prosthetic rehabilitation are involved.⁶

Extensive literature has reported excellent results obtained using carbon dioxide laser for other surgery in the oral cavity, such as vascular tumors,⁷ multiple oral epithelial hyperplasias,⁸ and actinic cheilitis associated with squamous cell carcinoma.³ The literature shows that laser irradiation as a surgical option possesses advantages over conventional techniques; however, the increase in adjacent tissue temperature can retard the cicatrization of the wound when compared with scalpel surgery.^{9,10} This is related to the delay in the reabsorption of the carbonized tissue and de-

creased fibroblastic activity, retarding the beginning of re-epithelization.^{9,11} Regarding the surgical-site wound and/or the cicatrization tissue, research is being conducted to optimize results, minimize the risks and costs for the patient, and assist the professional in determining the correct indications for the surgical procedures of choice.

The functional and esthetic results lead to the conclusion that the use of laser irradiation is a choice to be considered, providing a comfortable postoperative period with less edema and/or hemorrhaging. In addition, the use of a prosthesis is possible immediately after surgery, and because sutures are not required, mechanical trauma created by the prosthesis exerting pressure on sutures is avoided entirely.

REFERENCES

1. López-Labady J, Villarroel M, Lazard J, Rivera H. Fibroma Traumático. Revisión de la literatura y reporte dos casos. *Acta Odontol Venez* 2000;38:47-49.
2. Hoexter DL. Latest advances in laser systems and periodontal surgery. *Dent Clin North Am* 2001;45:207-212.
3. Niccoli-Filho W, Morosolli ARC. CO₂ laser treatment of actinic cheilitis associated with squamous-cell carcinoma of lower lip. *J Oral Applic* 2003;6:237-240.
4. Bouquot JE, Crout RJ. Odd gums: The prevalence of common gingival and alveolar lesions in 23,616 white Americans over 35 years of age. *Quintessence Int* 1988;19:747-753.
5. Barak S, Kaplan I, Rosenblum I. The use of CO₂ laser in oral and maxillofacial surgery. *J Clin Laser Med Surg* 1990;8:69-70.
6. Ferreira L, Nary-Filho H, Carvalho JAR. Aplicação do laser em Odontologia: um enfoque buco-maxilo-facial. *Sao Paulo, Salusvita* 1996;15:237-255.
7. Niccoli-Filho W, Sampaio TA, Guimaraes-Filho R. Efeitos da radiação laser de CO₂ em tecido osseo: estudo macroscopico em ratos. *Pesq Odontol Bras* 2001;15:127-132.
8. Luomanen M. Experience with a carbon dioxide laser for removal of benign soft-tissue lesions. *Proc Finn Dent Soc* 1992;88:49-55. Friesen LR, Cobb CM, Rapley JW, Forgas-Brockman L, Spencer P. Laser irradiation of bone: II healing response following treatment by CO₂ and Nd:YAG lasers. *J Periodontol* 1999;70:75-83.
9. Sanders D L, Reinisch L. Wound healing and collagen thermal damage in 7.5- microsec pulsed CO₂ laser skin incisions. *Lasers Surg Med* 2000;26:22-32.
10. Catone GA, Alling CC. Laser applications in oral and maxillofacial surgery, Philadelphia: W. B. Saunders, 1997.
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.

Contact address: Dr. Walter Niccoli-Filho, São Paulo State University – UNESP, Av. Francisco Jose Longo, 777, 12245-000 São Jose dos Campos, Brazil. Fax:+55-12-3947-9010. e-mail: niccoli@fosjc.unesp.br