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## Surgical treatment of ranula with carbon dioxide laser radiation

Received: 1 December 2003 / Accepted: 23 February 2004 / Published online: 2 April 2004  
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**Abstract** Ranula is a mucous extravasation cyst which appears as a swelling in the submental and submandibular regions. Several surgical techniques to manage ranula have been described in the literature, these techniques include the CO<sub>2</sub> laser radiation excision. Four patients were treated for intraoral ranula in the floor of the mouth by marsupialization with carbon dioxide laser radiation with defocused beam, continuous mode and 4 watts of power. There were no complications and no recurrences have occurred to date. The results showed that carbon dioxide laser radiation gives optimal results with no need for suture and good wound healing.

**Keywords** Carbon dioxide laser · Floor of the mouth · Marsupialization cyst ranula

### Introduction

Ranula is an extravasation cyst presents as a blue-domed, translucent swelling in the floor of the mouth. The term ranula derived from the Latin word rana, meaning “frog” as the shape of the cyst resembles the bulging underbelly of a frog [3]. The initial stage of ranula formation is excretory duct rupture followed by extravasation and accumulation of saliva into surrounding tissue [1]. This mucus that accumulates in the surrounding connective tissues, forms a pseudocyst that lacks an epithelial lining [2].

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CO<sub>2</sub> laser therapy is advocated in function of the intrinsic qualities of this type of radiation, especially when taking into consideration the benefits to the patient such as: smaller oedema and postoperative pain, absence of hemorrhagic episodes as well as a satisfactory result from the aesthetical/functional points of view [4].

Several surgical techniques to manage ranula have been described in the literature; these techniques include CO<sub>2</sub> laser radiation excision. The lingual nerve and artery and the submandibular duct, which are close to the sublingual gland, would be at risk for injury from this approach. We report four cases of ranula in the floor of the month treated with carbon dioxide laser radiation.

### Materials and methods

After approval of this protocol by the ethics commission in local research (protocol 101-PH/CEP-UNESP) we selected four patients at the Department of Biosciences and Diagnosis with diagnostic hypothesis of ranula (Fig. 1). All the patients were informed of the treatment choice and were given the chance to their concerns.

After careful surgical planning, local anaesthesia was achieved through infiltration of anaesthetic solutions in areas adjacent to the lesion. The dome is grasped with forceps and continuous CO<sub>2</sub> laser radiation (Sharplan Lasers, Israel, FAPESP 97/07645-2) was used to first outline the periphery of the lesion in continuous mode with 4 watts of power density, 0.8 mm focus with constant vacuum removal of the smoke plume (Surgifresh, Surgimedics, USA) to excise the dome. The marsupialization was done with laser vaporisation of the base of the ranula and the internal epithelium of the lesion (Fig. 2). No suturing was necessary. All the patients, as well the surgeon and team, were protected with laser safety glasses and masks. Intact removed tissue specimens were forwarded for anatomical and histopathological examination that confirmed our hypothesis. The returns for clinical evaluations were accomplished after 7 days, 1 month and 6 months of postoperative (Fig. 3).

### Results

The results showed in all four patients no history of pain, swelling or hemorrhagic episodes after surgery. After 7 days the postoperative exam showed no evidence