



Endoscopically-Assisted and Piezoelectric Intraoral Surgery: Application for Diagnosis and Treatment

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Abstract

Background: Minimally invasive procedures, such as the endoscopic-assisted surgery and the use of piezoelectric devices have widespread in several medical fields. Endoscopic- assisted techniques allow reduction of trauma and optimal visibility, also in narrow areas, thanks to the magnification of operatory field.

Methods: We report the case of a 78-year-old female who underwent the resection of a left mandibular central ossifying fibroma via an intraoral approach.

Results: Thanks to the employment of a rigid endoscope, the surgical field was easily reached and neoplasm resected with the piezosurgery device, thus limiting the extent of surgical invasion associated to optimal visibility and soft tissue protection.

Conclusions: The use of piezoelectric devices allows reducing sharp rotary cutting mills, lowering the risk of damages caused by the contact with the surrounding soft tissues, and in particular with nerves and blood vessels. Piezosurgery technique's main advantages include soft tissue protection, and optimal visibility, in particular around extremely narrow areas.

Keywords: Endoscope; Piezoelectric surgery; Ossifying fibroma; Visibility; Soft-tissue protection; Bone preservation

Introduction

Minimally invasive surgery challenges to reduce patients' trauma; this method has been applied in most of the surgical specialties, as well as in maxillofacial surgery. Endoscopic surgery can be considered a minimally invasive technique and can easily be applied to the removal of oral lesions, especially when located in the distal part of jaws, since their surgical removal involves the approach of narrow fields. The use of a dedicated 4-mm rigid endoscope in the oral cavity allows the magnification of the surgical field, thus limiting the risk of damages to the surrounding soft tissues, and increasing the precision of lesion's removal [1-3]. This important device can be combined with the use of piezoelectric instruments. The piezoelectric bone surgery has been designed for safely approaching oral lesions close to critical soft tissues such as nerves and vessels [4,5]. Moreover, in addition to the conventional technique, where rotatory drills shake blood out of the cutting area and visibility is reduced, the surgical field in piezosurgery remains almost free of blood, since it is washed away during the cutting procedure. In this report, we describe the combined use of endoscopic-assisted piezosurgery for the resection of a left mandibular central ossifying fibroma via an intraoral approach. To our knowledge there are only few reports describing this specific methodology in the field of oral medicine and pathology [6,7].

Case Presentation

The involvement of the patient has been conducted in full accordance with ethical principles, including the World Medical Association Declaration of Helsinki (version, 2002 www.wma.net/e/policy/b3.htm) and the additional requirements, after acquisition of a written consent by the recruited patient.

A 78-year old female patient, at the end of January 2016 was referred to the Division of Oral

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Received Date: 01 Sep 2017

Accepted Date: 30 Oct 2017

Published Date: 02 Nov 2017

Citation:

Giulia O, Matteo B, Giancarlo T, Roberto DL, Massimo R.

Endoscopically-Assisted and Piezoelectric Intraoral Surgery:

Application for Diagnosis and

Treatment. *Ann Clin Otolaryngol.* 2017; 2(4): 1025.

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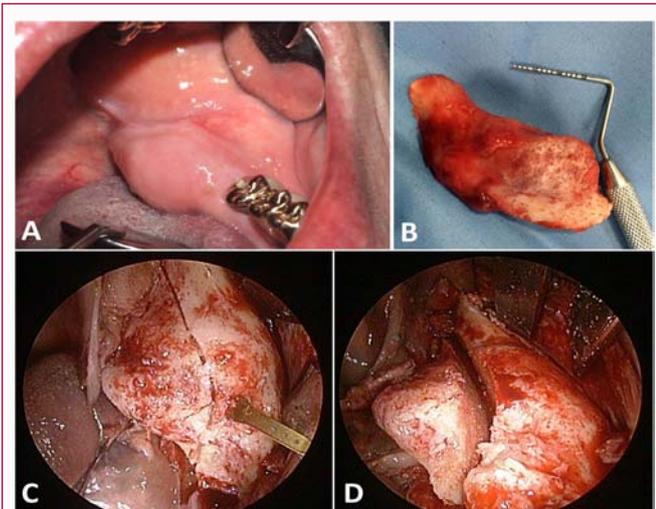


Figure 1: 78-year-old female patient affected by ossifying fibroma of the mandible: objective intraoral examination (A), lesion's demarcation (C,D) and removal (B) with piezoelectric instruments under endoscopically-assisted magnification.

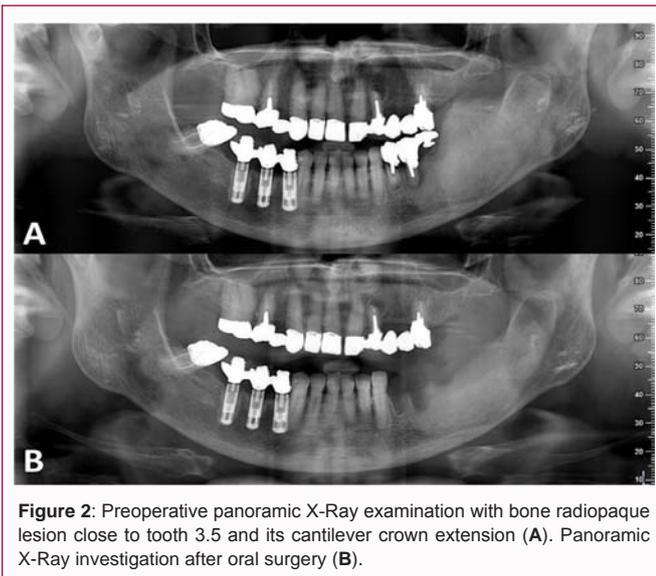


Figure 2: Preoperative panoramic X-Ray examination with bone radiopaque lesion close to tooth 3.5 and its cantilever crown extension (A). Panoramic X-Ray investigation after oral surgery (B).

Medicine and Pathology (Dental Science Department, University of Trieste) with a complaint of discomfort and growing lesion in the left side of the mandible (Figure 1 and A). Approximately 15 years before she had already been subdued to a surgical excision in the same anatomical district, although no histological analysis had been performed. Two weeks later, a panoramic X-Ray (Figure 2 and A) and a computed tomography scan (Figure 3A-C) were requested. No teeth displacement was detectable, despite the lesion was close to tooth 3.5 and the cantilever crown extension, while a radiopaque image was noted. Therefore, the patient was subjected to an incisional bone biopsy under local anaesthesia to clearly define the histological diagnosis. The histological diagnosis highlighted a benign bone lesion, compatible with an ossifying fibroma. Based on these results, it was decided to undertake a surgical procedure under general anaesthesia and nasotracheal intubation. Once the surgical access was performed, a Visera Elite system (OTV-S190 video processor and CLV-190 light source, OTV-S7Pro-10E HDTV camera; Olympus Medical Systems Corp, Tokyo, Japan) with a rigid endoscope with

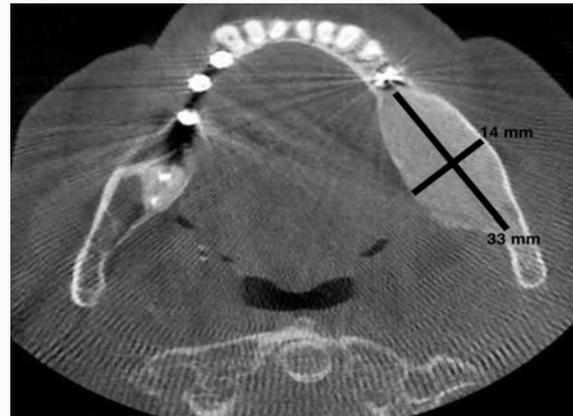


Figure 3: Preoperative computed tomography scan: the radiopaque mass measured 33mm in the anterior-posterior direction and was 14mm thick.

a viewing angle of 0° was employed while excising the lesion with a piezoelectric instrument (PIEZOSURGERY® touch, Mectron S.p.a., Genova, Italy). Figure 1C-D shows the intraoral surgery combining the endoscope and piezoelectric instruments. Tooth 3.5 and 3.4 were extracted during the surgical procedure. A postoperative panoramic X-Ray was performed as follow-up (Figure 2B). A second histological analysis of the biopsied lesion (Figure 1B) confirmed the diagnosis. After 1 year, the patient underwent postoperative follow-up and did not show any signs of pathology recurrence.

Discussion and Conclusions

It is of fundamental importance making a careful and accurate clinical assessment, before and during the surgical procedures. With the use of an endoscope it is possible to highlight and visualize narrow areas, facilitating the surgeon during the surgical procedures. To significantly reduce the damage of the surrounding soft tissues and the blood loss, the bone lesion was precisely removed with the concomitant use of piezoelectric instruments. Thanks to this technique we were able to protect oral soft tissues, minimizing the patient's post-operative discomfort and the procedure invasiveness. Finally, both techniques do not require a demanding learning curve by operators, but allow them to reach excellent results during surgical procedure, despite the purchase of an endoscope requires an important economic investment.

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