

# Traumatic neuroma of the inferior alveolar nerve: A case report

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## Abstract

Traumatic neuromas are rare entities which characteristically arise subsequently to surgery and are usually accompanied by pain, typically neuralgic. We present an unusual case of an intraosseous traumatic neuroma of the inferior alveolar nerve following tooth extraction. A 56-year-old man consulted for paresthesias and hyperesthesia in the left mandibular region following extraction of the left mandibular third molar (#38). The panoramic radiograph revealed a radiolucent lesion in the inferior alveolar nerve canal, and CT demonstrated the existence of a mass within the canal, producing widening of the same. Nerve-sparing excisional biopsy was performed. Histopathology and immunohistochemistry were consistent with traumatic neuroma of the left inferior alveolar nerve. After 3 years of follow-up, the patient is asymptomatic and there are no signs of recurrence.

**Key words:** Neuroma, traumatic, intraosseous, mandibular, inferior alveolar nerve, third molar.

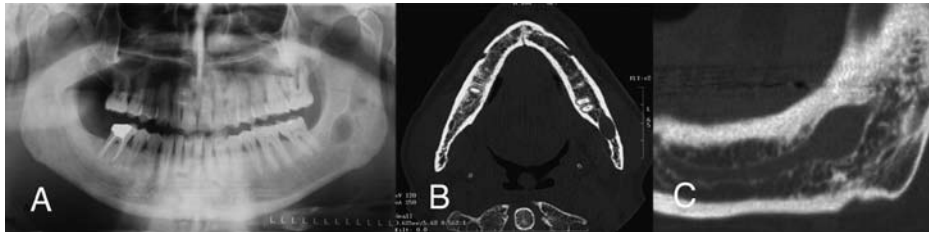
## Introduction

Traumatic neuroma is a rare disorder that occurs after trauma or surgery and involves the peripheral nerves. These lesions are generally not considered to be true neoplasms (1), but represent a frustrated attempt at nerve reparation, an exaggerated response to injury consisting of reactive hyperplasia of the nerve tissue, usually in the proximal end of a severed nerve. In the head and neck region, neuromas have been reported to occur more frequently subsequent to parotidectomy and neck dissection, and less so after mandibular osteotomy and tooth extraction (2-4). Common intraoral locations are the mental foramen, lower lip and tongue, but intraosseous neuromas are very uncommon. The purpose of this article is to present a rare case of intraosseous neuroma of the inferior alveolar nerve following traumatic tooth extraction and determine the diagnostic and therapeutic algorithm, providing a discussion of the clinical presentation, image findings, therapeutic management and a review of the literature of these infrequent lesions.

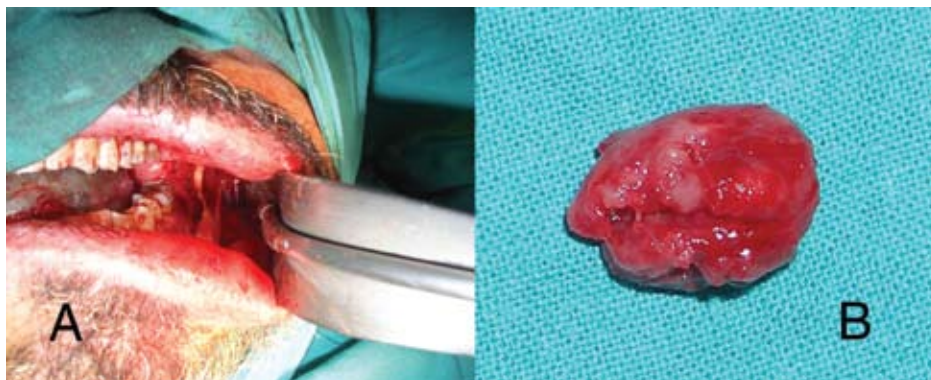
## Case Report

A 56-year-old male patient was referred by his general practitioner for hyperesthesia and paresthesias in the region of the second molar of the lower left quadrant and left lower lip. The patient had past history of episodes of mild regional cellulites in the left hemimandibular region which had been successfully treated with prescribed antibiotics and analgesics. Past surgical history was notable for surgical exodontia of an included third molar (#38) in the second decade of life. The patient accounted that the extraction was complicated and a painful postoperative period. The patient also consulted the odontologist in 3 different occasions for caries treatment in the superior molars.

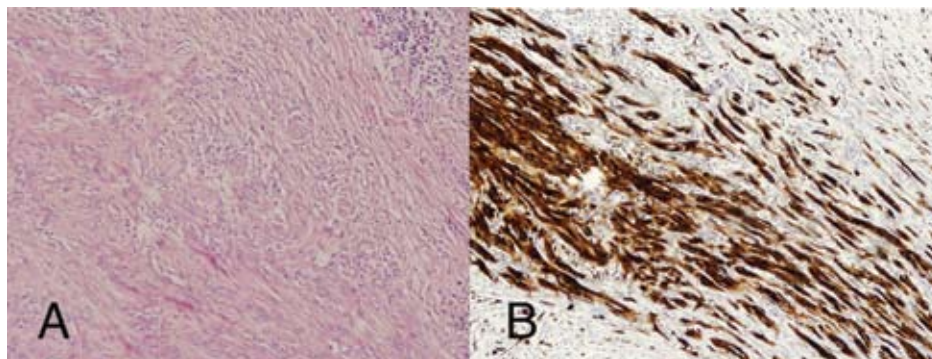
Physical examination was unremarkable. Hypo-anesthesia of the inferior lip and left mental region was evaluated with clinical sensory testing (tactile discrimination and thermal discrimination) which verified the subjective sensory deficiency of < 50% in the injured side in compa-



**Fig. 1.** A. Panoramic radiograph showing a lucent lesion in the left alveolar nerve canal. Note absence of left mandibular third molar overlying the lesion. B. Axial CT scan confirms presence of a lesion in the interior of the left inferior alveolar nerve canal. The lesion is well-defined and produces widening of the canal, without cortical disruption or expansion. C. Multiplanar oblique CT reformatted image shows expansion of the inferior alveolar nerve canal.



**Fig. 2.** A. Intraoperative view showing exposed inferior alveolar nerve canal after tumor exeresis. B. Gross specimen of the traumatic neuroma.



**Fig. 3.** A. Photomicrograph showing distorted and irregularly disposed interlacing nerve fibers in a collagenous and fibrous stroma in the traumatic neuroma. (Haematoxylin-Eosin stain. Magnification x100). B. Immunohistochemistry shows spindle shaped cells positive for both cytoplasmic and nuclear staining (S-100 protein stain. Magnification x100).

parison with the contralateral side. Panoramic radiograph was advised, which revealed an oval well-circumscribed, unilocular radiolucent lesion with a thin sclerotic border of about 1.5 cm in the inferior alveolar nerve canal, with widening of the same in the confluence of the left angle-ascending ramus (Fig. 1A). Computed tomography (CT) was performed demonstrating the existence of a well-defined non-expansive oval mass of 10x15x11mm in the inferior alveolar nerve canal, causing widening of the canal. (Figures 1B, 1C).

Given the findings described, an incisional biopsy under general anesthesia was planned for histological confirmation. Nerve-sparing excision biopsy was performed via an intraoral approach, with vestibular incision and osteotomy of the vestibular wall of the mandible, achieving blunt dissection and exeresis of the lesion. Dissection was straightforward due to the encapsulation of the tumor, which was not adhered the nerve and had well-defined cleavage plane, characteristics that permitted its complete exeresis whilst sparing the inferior alveolar nerve (Figure 2A).

No postoperative complications occurred.

Macroscopic analysis of the specimen revealed a brown rounded lesion of 1.5x0.7 cm (Figure 2B). Microscopically, the lesion was composed of irregularly arranged and interlacing nerve fibers in a fibrous stroma. Immunohistochemistry was consistent with traumatic neuroma (Figures 3A, 3B).

After 3 years of clinical and radiologic follow-up, the patient reported remission of symptoms and complete recovery of sensitivity, with absence of pain and complete recovery of sensitivity, with occasional dysesthesia.

## Discussion

Traumatic neuromas are very rare with only a few cases reported in the English literature (2-10). The etiopathogenesis is an exaggerated response to nerve injury, in most of the cases after direct trauma or surgical manipulation, with development of reactive hyperplasia and are not considered true neoplasms in origin (11). The mechanism of damage of the inferior alveolar nerve may be due to tooth extraction, which has been reported as the most frequent etiology (1,8) or a sagittal ramus split osteotomy (2-4,10).

Clinical presentation may vary. The most frequent symptom is pain, either neuralgic or non-neuralgic, which may be exacerbated by pressure (1). Other sensory anomalies may appear such as paresthesias, anesthesia or hyperpathia. The cause of the neurologic symptoms is compression of the nerve by the tumor, which owing to its slow growth allows compensatory mechanisms until a threshold is reached where the nerve is compromised and the symptoms begin.

At imaging, panoramic radiographs will suggest the presence of a unilocular lucent lesion embedded in the interior of the inferior dental nerve canal, which should be confirmed by CT (12).

In the differential diagnosis of entities that cause hypoesthesia or anesthesia of the inferior alveolar nerve, we mostly have to consider malignant lesions, due to nerve compression or invasion, but these usually have a shorter natural history. The development of neurological symptoms due to a benign process is exceptional. The radiologic differential diagnosis of unilocular lucent lesions of the mandible includes odontogenic cyst, keratocyst, central giant cell granuloma, desmoplastic ameloblastoma, fibromas and less likely metastasis and the malignant variants of the previously mentioned tumors (13,14).

Treatment of choice is nerve-sparing surgical exeresis. An optimal technique with minimal manipulation and severance of nerve fibers is essential for adequate outcome. Other second-line therapeutic options cited by different authors are stereotactic radiosurgery, local infiltration of steroids, sympathetic ganglion block, percussion, and ultrasonic therapy (1,3). Nerve sections or blockage with alcohol have proven to be ineffective and may even be detrimental (1).

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