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Case Report

From accident lip bite to Lesion: Traumatic Neuroma of the Lower Lip: A Rare Case Report

Yousef S.Z. Salem[1], Amna El-Gehani[2], Huda Alasmaa[1], Safa T. Hammad[3]

[1] Department of Oral and Maxillofacial Surgery, Al-Jalaa Trauma Hospital, Benghazi, Libya

[2] Department of oral pathology,Faculty of Dentistry, Benghazi University, Benghazi, Libya

[3]Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Tripoli University, Tripoli, Libya

Corresponding Author: Safa T. Hammad, Email: safathaer98@gmail.com

Abstract

Background: Traumatic neuroma is an uncommon, reactive, non-neoplastic proliferation of nerve tissue that develops following nerve injury or transection. It typically presents as a small, nodular lesion in areas prone to trauma, such as the lower lip, tongue, or mental foramen region. Clinically, it may appear as a painless or occasionally tender swelling and is often associated with a history of local trauma or chronic trauma. **Case presentation:** A 25-year-old Sudanese male presented to the Oral and Maxillofacial Surgery clinic with a localised swelling in the lower lip for approximately one week. The patient reported a history of repeated lip biting prior to the onset of the lesion. The swelling was initially small and gradually increased in size. It was painless, with no associated bleeding or discharge. Radiographic examination revealed no abnormality. An excisional biopsy was performed under local anaesthesia, and the specimen was submitted for histopathological evaluation, which confirmed the diagnosis of traumatic neuroma. **Conclusion:** This case highlights the importance of considering traumatic neuroma in the differential diagnosis of oral soft tissue lesions, particularly in the presence of a history of trauma. Histopathological examination remains the gold standard for definitive diagnosis, and surgical excision is associated with an excellent prognosis.

Keywords: Traumatic neuroma, Lower lip, Peripheral nerve injury, Reactive lesion, Oral soft tissue lesion, Schwann cells, Nerve proliferation, Histopathology, Minor salivary glands.

Introduction

Traumatic neuroma is a reactive proliferation of peripheral nerve tissue that occurs following injury or surgical intervention [1,2]. Despite its name, it is not a true neoplasm but rather represents a disorganised and excessive attempt at nerve regeneration [1].

Following nerve injury, the distal segment undergoes Wallerian degeneration, while the proximal segment attempts regeneration [3]. In cases where proper alignment between nerve ends is not achieved, axonal growth becomes disorganised, leading to the formation of a neuroma [3,4]. This process is influenced by various cellular and molecular factors, including Schwann cell proliferation and signalling pathways involved in nerve repair [3].

The prevalence of traumatic neuroma in the oral cavity is relatively low, estimated at less than 1% [5]. It most commonly occurs in areas prone to repeated trauma, such as the lower lip, tongue, and mental foramen region [6,7]. A clear history of trauma, such as tooth extraction, surgical procedures, or chronic mechanical irritation (e.g., lip biting), is frequently associated with its development [1,8].

Clinically, traumatic neuromas typically present as small, firm, well-circumscribed nodules that may be either painful or asymptomatic [6]. Although pain has traditionally been considered a hallmark feature, it is absent in a significant proportion of cases [7]. Due to their nonspecific clinical appearance, these lesions are often misdiagnosed as more common entities such as mucoceles or fibromas [6,7]. Therefore, histopathological examination is essential for establishing a definitive diagnosis [1].

Histologically, it is characterised by irregular bundles of nerve fibres embedded within a fibrous connective tissue stroma, along with Schwann cells and other supporting elements [6].

Management of neuroma is generally categorised into conservative and surgical approaches [9]. Conservative care focuses on prevention, early intervention, and non-operative methods such as local anesthetic–steroid injections, opioid therapy, transcutaneous electrical nerve stimulation and other methods [9]. Since the lesion is progressive and frequently associated with pain, the recommended treatment is surgical excision [10]. The most common surgical treatment is a dorsal approach neurectomy, where the affected nerve is excised under tension. **The prognosis** is generally excellent, with a low recurrence rate as the lesion is removed completely and the source of irritation is eliminated [3]

This case report highlights an uncommon clinical scenario of traumatic neuroma presenting within a short duration and without pain, which may lead to misdiagnosis. It emphasises the critical role of microscopic examination in establishing the definitive diagnosis based on histo-pathological features of the lesion.

Case Report:

A 25-year-old Sudanese male presented to the Oral and Maxillofacial Surgery clinic with a chief complaint of a localised swelling in the lower lip that had been present for approximately one week. The patient reported a history of repeated lip biting before the onset of the lesion. The swelling was initially small and gradually increased in size over time. It was not associated with pain, bleeding, or discharge. The patient's medical and dental history was non-contributory. He reported no history of systemic disease, medication use, or previous surgical interventions in the affected area.

Clinical Examination

Extraoral examination revealed no facial asymmetry, swelling, or lymphadenopathy. The overlying skin appeared normal. Intraoral examination revealed a well-circumscribed nodular lesion located on the lower lip mucosa. The lesion measured approximately 0.6–0.8 cm in diameter. It was firm in consistency, non-tender upon palpation, and covered by intact mucosa with no evidence of ulceration or secondary infection Figure 1.

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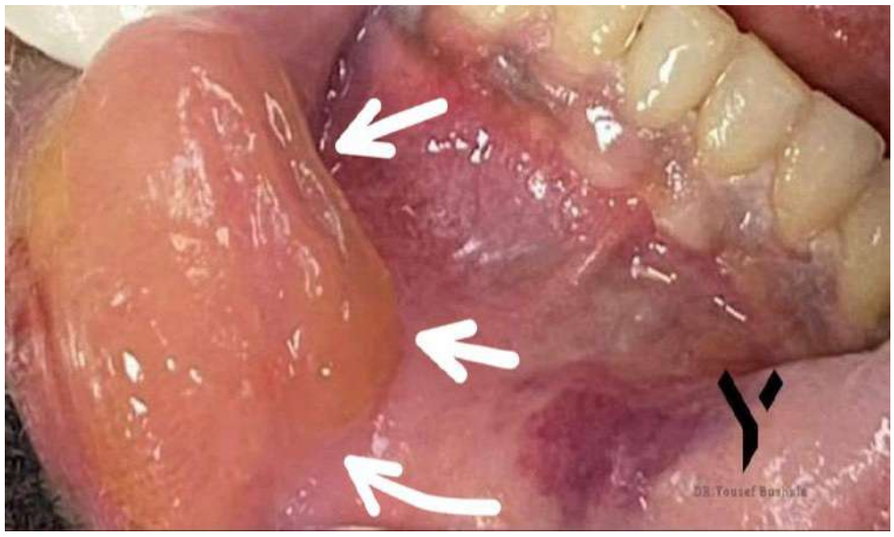

Figure 1. A photograph showing a well-circumscribed nodular lesion, firm in consistency, in the lower lip.

Differential diagnosis

Based on the clinical presentation, the initial differential diagnosis included mucocele, irritation fibroma, lipoma, neurofibroma, mucosal neuroma, Schwannoma, and traumatic neuroma.

Surgical intervention

Following clinical evaluation, a decision was made to perform an excisional biopsy under local anaesthesia. Standard aseptic protocols were followed. A conservative surgical approach was used to completely excise the lesion. The specimen was removed and submitted for histopathological examination. Hemostasis was achieved, and primary closure was performed using interrupted sutures Figure 2.

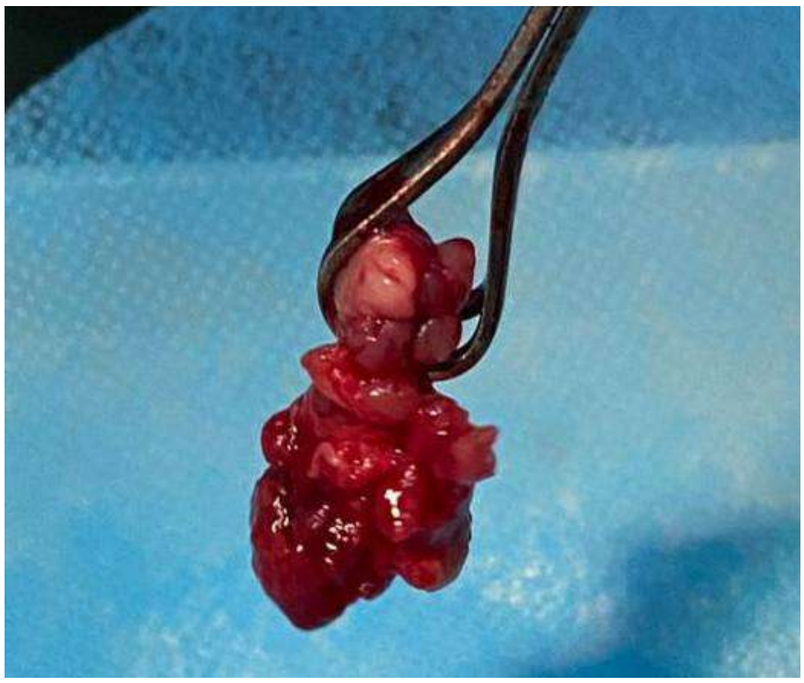

Figure 2 . Intraoperative photograph showing an excisional biopsy

Histopathologic findings:

-Gross examination revealed a firm tissue specimen measuring approximately 1.5 × 2 cm.

-Microscopic examination demonstrated a hyperplastic, edematous surface epithelium overlying a fibrous connective tissue stroma. The stroma contained multiple vascular spaces of varying sizes, along with areas of acinar hyperplasia and dilated ducts. Notably, numerous irregularly arranged bundles of nerve fibres were identified within the connective tissue.

These neural elements appeared disorganised and interwoven, consistent with a reactive proliferation rather than a neoplastic process. No evidence of cellular atypia or malignancy was observed.

Based on these histopathological features, a definitive diagnosis of traumatic neuroma was established Figure 3.

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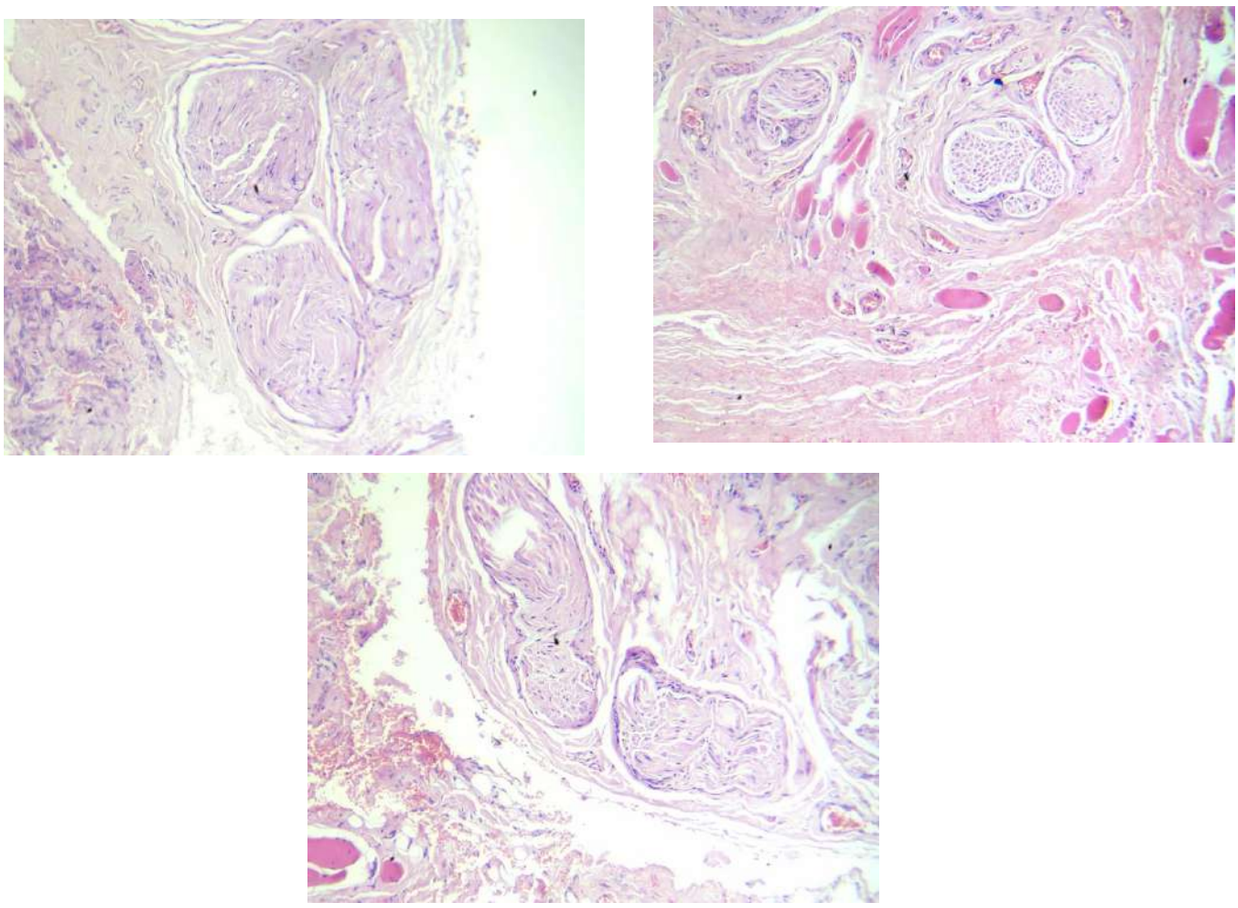

Figure 3. Histopathologic photomicrograph demonstrating hyperplastic edematous surface epithelium, fibrous connective tissue stroma containing multiple vascular spaces of variable sizes, acinar hyperplasia, dilated ducts and multiple bundles of nerve fibres.

Follow up & outcome:

At the three-month follow-up, healing was uneventful. The surgical site showed complete epithelialization with no signs of infection or complications. The patient reported satisfaction with the outcome, and no evidence of recurrence was observed during the follow-up period Figure 4.

Figure 4 . Postoperative photograph showing complete healing, and no recurrence was observed.

Discussion:

Traumatic neuroma is a well-recognised reactive lesion of peripheral nerves that arises as a consequence of nerve injury, representing a disorganised regenerative response rather than a true neoplasm. It typically develops following surgical procedures, accidental trauma, or chronic mechanical irritation, all of which interfere with normal axonal regeneration and lead to haphazard proliferation of nerve fibres within a fibrous stroma [11].

In the present case, the patient reported a clear history of repetitive lip biting prior to lesion development, supporting the role of chronic low-grade trauma as a significant etiological factor. Recent literature emphasises that even minor but repeated mechanical irritation can disrupt

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coordinated nerve healing, resulting in aberrant axonal sprouting and neuroma formation [12]. This highlights the importance of recognising parafunctional habits, such as lip biting, as potential contributors to peripheral nerve injury in the oral cavity.

Clinically, traumatic neuromas often present a diagnostic challenge due to their non-specific appearance. They commonly manifest as small, firm nodules that may be either painful or asymptomatic. Although pain has traditionally been considered a characteristic feature, several contemporary reports indicate that a substantial proportion of cases lack pain, which may lead to misdiagnosis [12,11]. In the current case, the lesion was entirely painless; it presented as a small, well-circumscribed, painless nodule on the lower lip, which is consistent with findings reported in recent literature [7,8].

The differential diagnosis in such cases is broad and includes more common lesions such as mucocele, irritation fibroma, lipoma, and benign peripheral nerve tumours, including neurofibroma and schwannoma. Due to this clinical overlap, definitive diagnosis cannot rely solely on clinical examination. Histopathological evaluation remains the gold standard, demonstrating the hallmark feature of disorganised bundles of nerve fibres embedded within a collagenous connective tissue stroma without evidence of atypia or malignancy [11]. These microscopic findings are essential for distinguishing traumatic neuroma from other tissue lesions.

Management of traumatic neuroma primarily involves complete surgical excision, which serves both diagnostic and therapeutic purposes. The prognosis is generally excellent, with a low risk of recurrence when the lesion is adequately removed and the source of irritation is eliminated [12]. In this case, surgical excision resulted in uneventful healing and no recurrence at follow-up, consistent with outcomes reported in recent literature.

What makes this case particularly noteworthy is the relatively rapid onset of the lesion within a short duration and its asymptomatic presentation, both of which may contribute to diagnostic ambiguity. Such features underscore the importance of thorough history-taking and maintaining a high index of suspicion for traumatic neuroma, even in cases lacking classic symptoms such as pain.

Conclusion

This report illustrates that traumatic neuroma is a rare, reactive lesion that can present as a small, asymptomatic nodule in the oral cavity, particularly in areas prone to trauma such as the lower lip. It emphasises the importance of considering traumatic neuroma in the differential diagnosis of oral soft tissue lesions, even in the absence of pain. Histopathological examination remains essential for definitive diagnosis.

Surgical excision is a safe and effective treatment modality, with an excellent prognosis and low risk of recurrence when appropriately performed.

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