

Trigeminal Nerve Injuries in Correlation with Daily Dental and Maxillofacial Medicine

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Abstract

Oral and maxillofacial medicine is in close relation with trigeminal nerve, and such daily dental procedures, impacted teeth, dental implants placement, oral and oral maxillofacial medicine including trauma, even injection of local anesthesia can damage trigeminal nerve. Auspiciously, most nerve injuries will undergo natural recovery, with small portion of cases resulting in permanent sensory deficits. Many patents suffering trigeminal nerve problems, present at family medicine doctors as well, or direct to medical specialist like dentist, oral maxillofacial medical specialists, neurologist or neurosurgeons as well. Subsequently, early assessment and diagnosis, often involving multidisciplinary team optimize recovery in respect of time and minimize the complication.

Keywords: Trigeminal nerve, oral, maxillofacial, medicine, damage, assessment, recovery

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Introduction

Trigeminal nerve and its peripheral branches are vulnerable to injury in daily practice of dentistry and oro maxillofacial medicine. Neurosensory deficits can be devastating to some patients due to their effects on speech, taste, eating, and activities of daily living as well.

However, majority of these peripheral trigeminal nerve injuries experience spontaneous regeneration¹. Nevertheless, some injuries may be permanent with varying degrees of sensory impairment ranging from hypoesthesia to complete anesthesia. Some patients may even progress burning pain called dysesthesia in addition to their sensory deficits. Trigeminal innervation pattern illustration in figure 1.

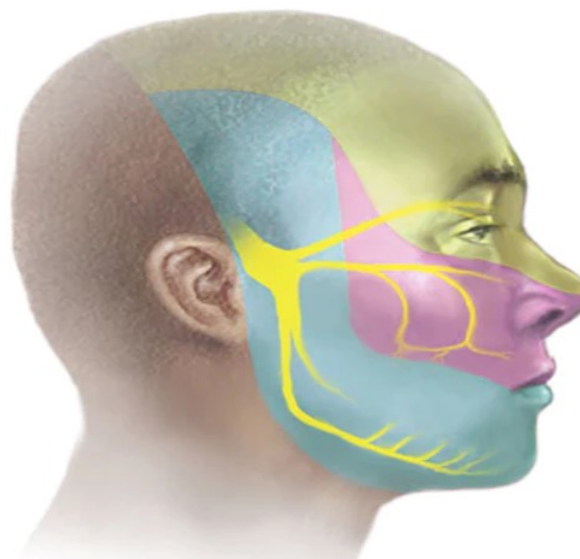


Figure 1. Illustration of trigeminal innervation. Illustration photo MAYO credit.

Most common procedures associated with trigeminal nerve injury in daily practice of dentistry include removal of impacted third molars and placement of endosseous dental implants, illustrated in figure 2.



Figure 2. Endodontic materials extruded into the inferior alveolar

Endodontic materials extruded into the inferior alveolar nerve such as this paste represent one of most frequently observed etiologies for trigeminal nerve injuries. Further causes can include endodontic procedures and even administration of local anesthesia. Other less common surgical procedures include orthognathic surgery with osteotomies, facial trauma, and management of maxillofacial pathology.

Discussion

The public healthcare service in Albania is organized at the primary, secondary, and tertiary service levels, and approximately 413 public healthcare clinics offer primary and secondary healthcare services and 42 public hospitals offer tertiary healthcare services, while pharmaceutical and dental services are almost entirely private.² So, in general most of patients go through family physician clinics in order to see a specialist, however, in respect to dental medical service and oral maxillofacial medicine, often go direct to medical specialist services as they run privately.

In dental and oral maxillofacial medical practice, most regularly observed etiologies for trigeminal nerve injuries include dental extractions, especially in Albania where tooth extraction procedure is not done well by many medical dental physicians therefore increasing the incidence of trigeminal nerve or its peripheral branches mutilation. Placement of implants, and endodontic procedures where endodontic materials are extruded into the inferior alveolar nerve canal are also common daily dental practice procedures of such injuries.

Dental implant therapy has become over the years a well-defined procedure with increasing indications in Albania, an increasing medical tourism in dentistry as well. Definitely, dental implant therapy is believed to be second cause of trigeminal nerve injury and sensory disturbances, after third molar extraction^{3,4,5}.

Momentary or permanent sensory nerve disturbance associated with removal of impacted third molars together with surgical exodontia is a result of lingual and/or inferior alveolar nerve damages³. In some cases, socket conservation techniques using allogeneic bone grafts result in bone being displaced into the nerve canal, which can cause nerve injuries as well.

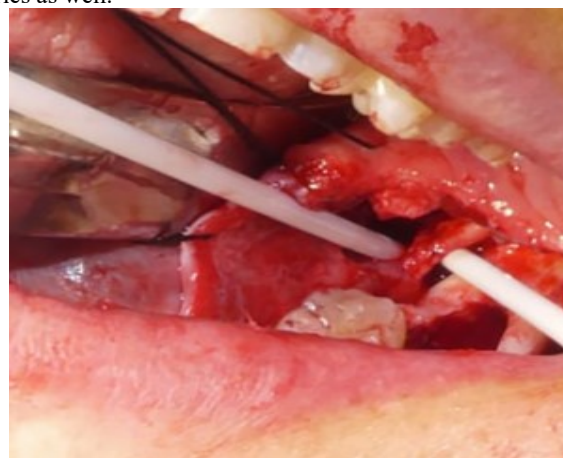


Figure 3. Illustration of a case of lingual nerve injury after third molar removal

Proper preparation, assessment and training should be undertaken in order to minimize injury. Safe practices in order to ovoid nerve injury is sometimes attempted by using techniques including nerve

lateralization and alveolar distraction, yet, these procedures are themselves high risk, and may be more likely to result in injury⁶.

Oro maxillofacial trauma is also a well-known contribution to trigeminal and peripheral nerve injuries, and radiography is commenced, starting with panoramic x-ray, and as well as cone beam computed, and other radiographs modalities as per each case. Often multidisciplinary team is involved including neurologist, neurosurgeon as well, in order to optimize the recovery and proper treatment.

Conclusions

Even a daily procedure in dental medical practice and ora maxillofacial intervention as well, trigeminal nerve injury is faced in daily clinical practice, so a better training for young medical dental physician and oral maxillofacial surgeon should be in front line of minimizing such complication and optimizing the quality of care in oral health service and patient safety.

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