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Short Communication

Identification and Management of Nerve Injuries During Third Molar Surgery

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One of the most common complications associated with oral surgical procedures are iatrogenic injuries to branches of the mandibular branch of Trigeminal nerve, which can result in the patient experiencing severe pain, permanent change in sensation as well as significant functional and psychological incapacity. The surgical removal of mandibular third molars is one of the most common oral surgical procedures. It is associated with a number of perioperative complications, including nerve injuries. In this communication, the different factors associated with nerve injuries are discussed and the protocols to manage these injuries.

Inferior alveolar nerve (IAN) injury (Figure 1) is the most frequent complication associated with third molar surgery. Following injury, the severed nerve ends do not retract within the mandibular canal and remain in apposition thus making regeneration within the canal possible unless obstructed by displaced fragments of bone. Good recovery is hence expected. Numerous studies have reported the frequency of nerve injury during the removal of third molars to be about 4 - 5% of procedures (range 1.3 - 7.8%). The majority of patients will recover normal sensation within a few weeks or months and less than 1% (range 0 - 2.2%) have a persistent sensory disturbance.

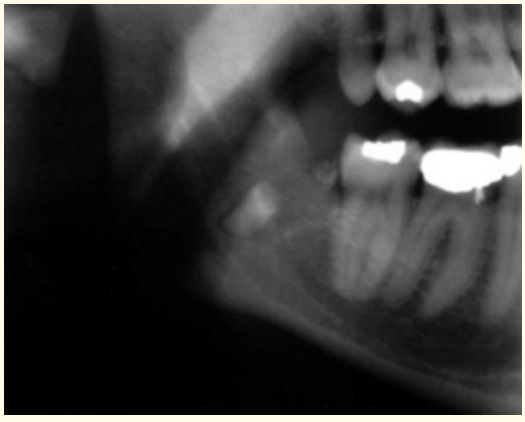

Figure 1: *Cropped pantomogram showing injury to Inferior alveolar nerve.*

If the IAN is accidentally damaged during the procedure, repair is indicated at the time of the procedure. The severed ends of the nerve should be closely approximated within the mandibular canal to allow for regeneration of the nerve. At the review visit, if a sensory disturbance is reported by the patient, recovery should be examined using sensory tests. Patients with paraesthesia in areas supplied by IAN (such as lower lip) typically require no surgical management. Patients presenting with total anaesthesia postoperatively should be radiographically evaluated to confirm that the mandibular canal has not been displaced to form an obstruction to regeneration. If this

has occurred, then the repositioning of the fragments should be performed without delay. The patient may need to be referred to OMS surgeon. The patient should be advised that complete recovery may not follow this procedure.

If the patient still suffers from anaesthesia 3 months after the injury, new radiographs should be obtained to assess the integrity of the Mandibular canal. Surgical exploration and decompression of the nerve should be considered if the canal is disrupted and if there is substantial dysaesthesia and little recovery of sensation.

Unlike IAN, the Lingual nerve is not covered by bony canal but rather a thin layer of mucosa and soft tissue. Hence, if the Lingual nerve is severed, the ends of the severed nerve retract apart and, if the adjacent soft tissue is also distorted, the nerve ends may become misaligned. Nerve regeneration is more successful if the nerve endings are in close apposition.

Frequency of lingual nerve injuries associated with third molar surgery range widely from 0.2 - 22% of patients presenting with sensory disturbances in the initial period postoperatively. Around 0 - 2% of patients report permanent damage to the Lingual nerve postoperatively. There are a number of possible reasons for the widespread range in incidence of Lingual nerve damage. The discrepancy in reporting Lingual nerve injuries may be due to the differences in the assessment of nerve injury from time of surgical removal. If assessment of Lingual injuries is done early following surgery, many cases will be reported however the majority of these resolve rapidly and hence it is not a true reflection of the incidence of total damage to Lingual nerve. Numerous studies have shown that raising a lingual mucoperiosteal flap is linked with a greater frequency of lingual nerve injuries. Many of these studies demonstrated that raising a lingual flap is unnecessary and is best avoided.

If a lingual nerve is accidentally severed during third molar surgery, the ends of the nerve should immediately be repaired using epineurial sutures. If this can't be done by the operator, the patient should be referred to OMS specialist without any delays. During the early review visit, the existence of some sensory response to stimulation of the tongue implies that the Lingual nerve is partially intact and hence no treatment should be done other than continued review to assess the recovery of the Lingual nerve. If total anaesthesia is present due to a severed nerve, surgical intervention may not be warranted in the early period postoperatively.

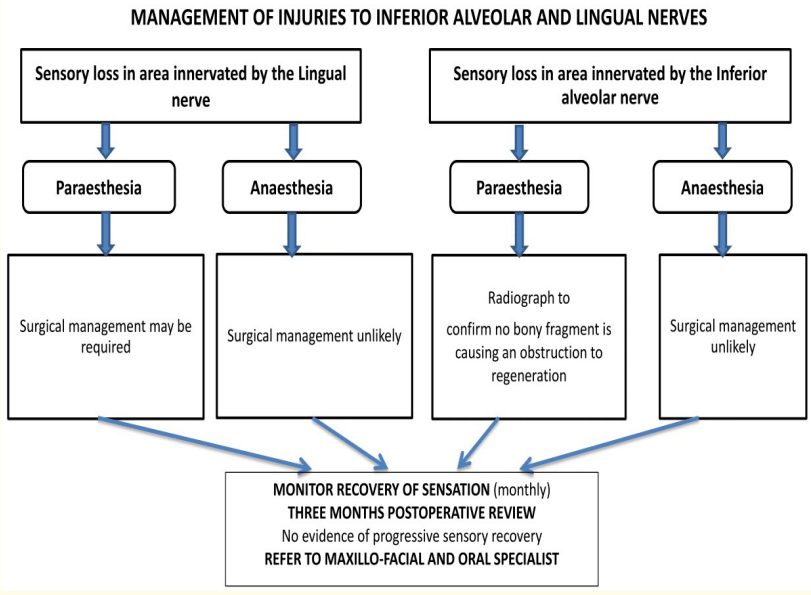

Figure 2: *Protocol for management of nerve injuries in oral cavity as adapted from Loescher., et al. 2003.*

The most common nerve injuries following oral surgical procedures occur to the Inferior alveolar and Lingual nerves. Proper identification and management of these nerve injuries is of paramount importance especially for the patient's wellbeing and quality of life. The extent and severity of the injury should be identified and monitored through regular follow-ups. Surgical management is applicable in certain cases and should always be performed by an experienced OMS specialist. In the case of a severed Inferior alveolar nerve it is usually not indicated to perform surgery but may be undertaken in cases where severed nerve ends are misaligned or when a bony fragment compresses the Mandibular canal. On the other hand, surgical exploration and microsurgical repair are usually indicated for Lingual nerve injuries that do not show any signs of sensory recovery after 3 - 4 months postoperatively.

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