

CLINICAL DISCUSSION

Prevention of mandibular nerve injury associated with dental implant placement: preoperative and intraoperative recommendations

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Clinical Question

How can we minimize mandibular nerve injury during dental implant placement?

One of the common complications after implant placement is nerve injury. This complication usually results in the altered sensation of the lower lip, chin, mucosa, alveolar gingiva, teeth and/or tongue. The mandibular nerve injury is the most frequent due to the reabsorption of the alveolar ridge after its atrophy due to lack of stimuli after extraction.

Pre-operative recommendations

- Informed consent for implant placement must be given to the patient. The surgeon should forewarn the patient regarding the possibility of postoperative impaired sensation.
- A thorough clinical examination and treatment planning must be performed.
- Radiographic examination to assess the location of the inferior alveolar canal (IAC) of the mandibular nerve and the mental foramen:
 - The panoramic radiograph, preferably digital, is useful as the primary image study to assess the vertical distance from the crest of the edentulous mandibular alveolar ridge to the superior aspect of the IAC.

- If the panoramic film shows inadequate distance from the edentulous alveolar crest to the IAC to place an implant, a computed tomography (CT) scan is required.
- CT scans have improved resolution and allow:
 - Visualization of the IAC in 3 dimensions.¹
 - Coronal sections which are the most useful to assess structural bucco-lingual relationships and assessment of the IAC's shape (round, teardrop, dumbbell) and osseous cortication.²

Intra-operative recommendations

- Intra-operative radiographs during implant preparation and after implant placement are required in order to assess the position and angulation of the implant.
- Surgical equipment with predetermined depth stops as well as careful surgical technique is necessary.
- During implant placement, cancellous bone may be compressed against the contents of the IAC, possibly causing mandibular nerve damage.
- If the post-operative radiograph indicates encroachment on the IAC:
 - The implant should be removed;
 - Dexamethasone should be introduced into the osteotomy site as follows³:
 - Dexamethasone liquid 4 mg./ml. applied topically for 1 minute and repeated once.
 - Followed by a 7day day regimen of dexamethasone orally as follows:
 - Days one and two: 8mg. per day
 - Days three and four: 6 mg. per day
 - Days five and six: 4 mg. per day
 - Day seven: 2 mg.
 - An appropriate antibiotic must be prescribed.
 - Oral dexamethasone must be voided in patients with preexisting cardiac, hypertensive and/or renal issues since such high doses may lead to a hypertensive crisis.
- A shorter implant should be considered and no bone grafting materials should be placed in order to avoid migration into IAC.⁴

Conclusion

One of the serious complications of posterior mandibular implant placement is nerve injury. Proper understanding of the involved anatomy and the surgical procedures, along with proper treatment planning, will reduce the chances of such morbidity to the patient. If nerve injury occurs, early and proper management is the key to maximizing the chances of recovery.

References

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