Iatrogenic damage to the lingual nerve: reliability of neurophysiological tests for the diagnosis and the outcome assessment of reparative microsurgery.

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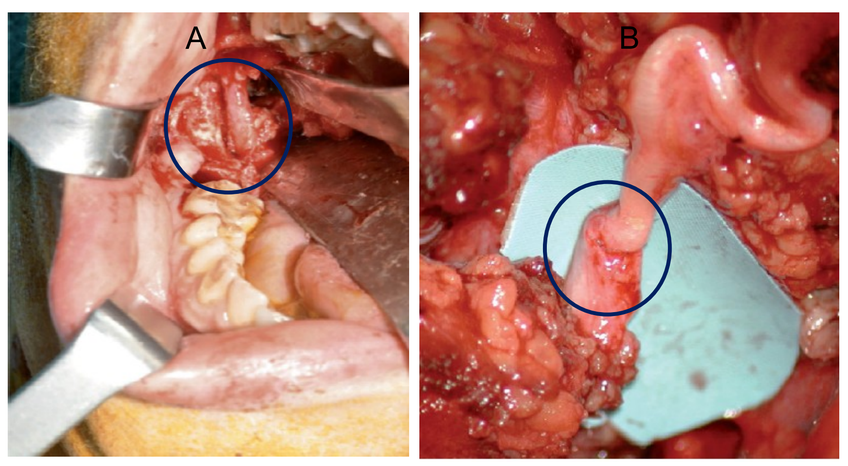
Objectives - Lingual nerve damage can occur during oral surgery, especially in case of avulsion of the lower VIII teeth. Severe axonotmesis or neurotmesis does not recover spontaneously and a microsurgical nerve repair conducted by an expert team is necessary to attempt a restore of sensory functions (*Fig.1*). This study was conducted to verify the validity and reliability of neurophysiological evaluation of lingual nerve iatrogenic damage for the preoperative diagnosis and follow-up.



ig.1 – Lingual nerve identification (A) and «end to end» suture after amputation neuroma removal (B).

Materials - 10 patients with documented iatrogenic lesion of the lingual nerve (anesthesia or severe hypoesthesia and ageusia or severe hypogeusia of half of the tongue) were evaluated by examination of masseteric inhibitory reflex (MIR) both before microsurgical reconstruction with neurorrhaphy and in a post-operatory follow up

Methods - We evaluated the tactile and pain sensory thresholds (TST and PST expressed in milliamps - mA) on the unaffected side of the tongue by means of electrical stimulation delivered with teflon-coated needle electrodes placed on the upper surface of the tongue at an interelectrodes distance of 1 cm. MIR was elicited at 6 or 9 times pain threshold stimulus strength. The same test was conducted on the affected side with comparison of threshold values (percentage ratio) and evaluation of MIR at different intensities of stimulation (intensity of the healthy side and then 6 to 9 times the intensity of the tactile and pain threshold if found). The study was conducted before the microsurgery and subsequently at 6 and 12 months after surgery. (*Fig.2*).

Fig.2 – Sensory thresholds M.I.R. assessment in a right lingual nerve lesion.

Results - The tactile and pain sensory thresholds (TST and PST) were significantly increased on the affected side before surgical reconstruction (unaffected side: tactile threshold 0.45+/- 0.12 mA, pain threshold 1.48+/-0.55 mA; affected side: tactile threshold 1.90 + / - 1.5 mA, pain threshold: 6.4+/-5.2 mA; ratio affected/unaffected side threshold: tactile 10-60%, pain 8-52%) (*Fig.3A*). The SP1 and SP2 of the MIR were altered (absence of the components or poor representation of them) (*Fig.4B*).
In the 12 months follow-up, all patients showed a recovery of sensory modalities, with improved tactile and pain sensitivity reflected in an average value ratio of 49.0% and 47.5% (in two patients recovery was respectively 70% and 80 %) (*Fig.3B*) and a return of MIR responses, although with elongated latencies (*Fig.4C*) .

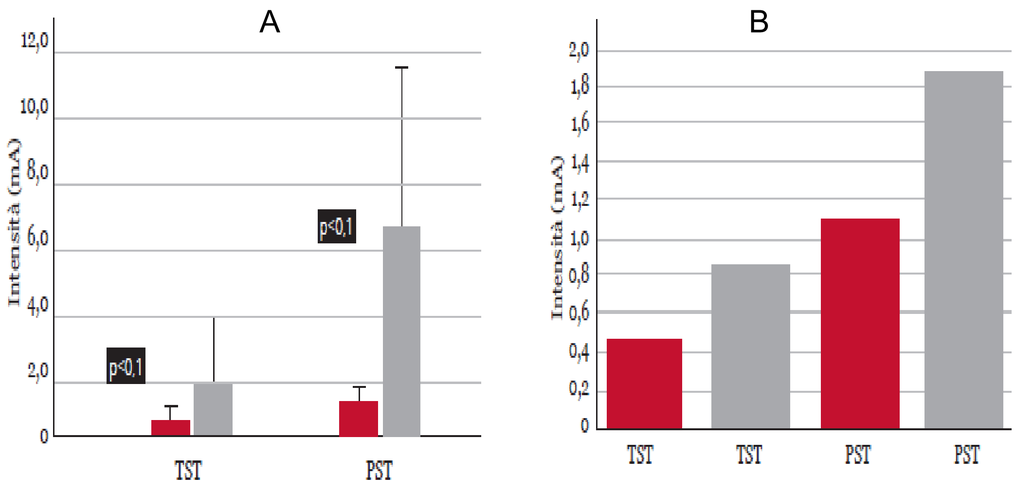


Fig.3 – Difference of tactile threshold (TST) and pain threshold (PST) before microsurgery (A) and after 12 months follow-up (B). Unaffected side Affected side

Discussion & conclusion - The method applied has proved useful in order to objectify a lingual nerve injury before microsurgical repair. Furthermore, it has been helpful in verifying the recovery of the sensitivity in the subsequent follow-up. Microsurgical repair of lingual nerve lesions can dramatically improve the symptoms of patients and the collaboration between maxillofacial surgeon and neurophysiologist is definitely useful for this aim.

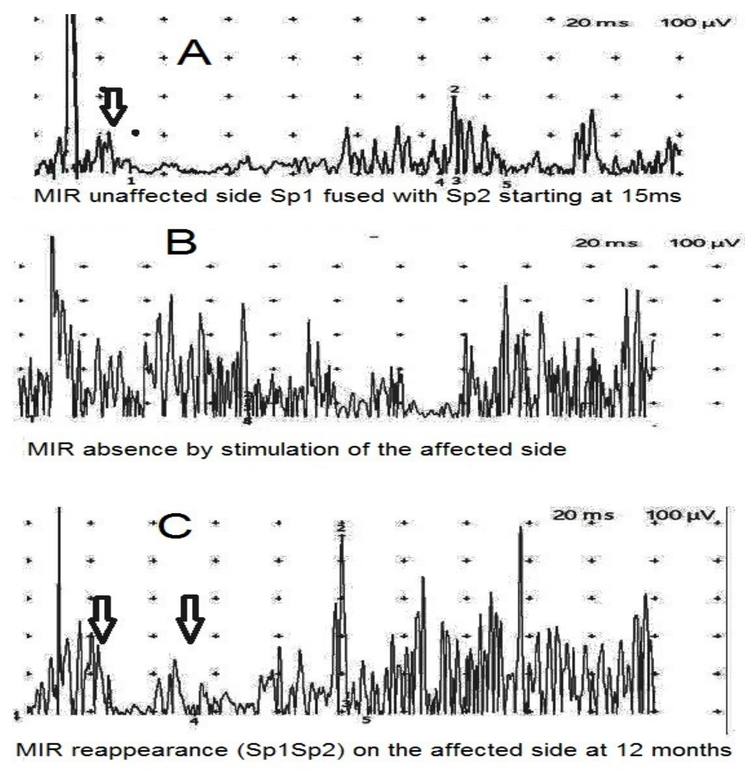


Fig.4 – MIR unaffected side (A) before surgery (B) and after 12 months follow-up (C).

References

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