

POSTOPERATIVE NEUROSENSORY DEFICITS FOLLOWING ORTHOGNATHIC SURGERY: ASSESSMENT AND CLINICAL OUTCOMES

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Abstract: *Neurosensory disturbances are among the clinically significant complications that may occur following orthognathic surgery. These disturbances can affect sensory function in the lower lip, chin, and other facial regions, potentially influencing patients' daily activities and quality of life. This article examines the clinical characteristics of postoperative neurosensory deficits, their possible causes, assessment methods, and recovery patterns. Particular attention is given to the involvement of sensory nerves, the importance of preoperative evaluation, and the use of standardized clinical tests to monitor postoperative changes. The role of regular follow-up in identifying persistent sensory abnormalities and evaluating recovery is also discussed. A comprehensive approach to sensory assessment may support individualized postoperative management and contribute to improved clinical outcomes.*

Keywords: *Orthognathic surgery, neurosensory disturbances, inferior alveolar nerve, nerve injury, sensory assessment, postoperative complications, sensory recovery, maxillofacial surgery.*

Introduction

Orthognathic surgery is an important field of oral and maxillofacial surgery aimed at correcting dentofacial deformities, restoring proper jaw relationships, improving occlusion, and enhancing patients' facial aesthetics and quality of life. Modern surgical techniques have made it possible to achieve predictable functional and aesthetic outcomes in patients with congenital or acquired maxillofacial abnormalities. However, despite advances in surgical planning, instrumentation, and operative techniques, postoperative complications remain a clinically significant concern. Among these complications, neurosensory disturbances are particularly important because they may affect facial sensation, patient comfort, and everyday activities. Postoperative neurosensory disturbances may develop following procedures such as bilateral sagittal split osteotomy and Le Fort I osteotomy. These changes are commonly associated with temporary or persistent impairment of sensory nerve function, particularly involving the inferior alveolar nerve and the infraorbital nerve. Clinically, patients may report numbness, tingling, reduced tactile sensitivity, altered perception of temperature, or unpleasant sensations in the lower lip, chin, and midfacial regions. The severity and duration of these symptoms vary according to the surgical procedure, the extent of tissue manipulation, individual anatomical characteristics, and the degree of nerve injury.

Relevance

Neurosensory disturbances following orthognathic surgery may negatively affect patients' sensation, daily activities, and quality of life. Early detection, accurate assessment, and monitoring of sensory recovery are essential for improving postoperative outcomes.

Aim

To investigate the clinical characteristics of neurosensory disturbances following

orthognathic surgery, evaluate assessment methods, and examine the dynamics of sensory recovery.

Main part

Neurosensory deficits are important complications that may occur after orthognathic surgery. They are mainly associated with changes in the function of sensory nerves supplying the facial and oral regions. Patients may experience numbness, tingling, reduced tactile sensitivity, or abnormal sensations in the lower lip, chin, and cheeks. These symptoms may vary in severity and duration depending on the surgical procedure and the extent of nerve involvement. The inferior alveolar nerve is particularly vulnerable during mandibular osteotomy because of its anatomical relationship with the mandibular bone. The infraorbital nerve may also be affected during maxillary procedures. Some patients experience temporary sensory changes that gradually improve during recovery, while others may have persistent symptoms. Clinical evaluation should include the location, intensity, and character of sensory disturbances. Patient-reported symptoms provide valuable information about the functional impact of these changes. Careful documentation helps clinicians identify postoperative abnormalities and monitor their progression. Understanding these clinical characteristics is essential for appropriate postoperative management.

The development of postoperative neurosensory deficits depends on several anatomical and surgical factors. The inferior alveolar nerve is closely related to the mandibular canal and may be affected during bilateral sagittal split osteotomy. Mechanical pressure, stretching, compression, or direct trauma may alter normal nerve function. The degree of mandibular advancement can also influence the risk of sensory disturbances. Anatomical variations in the mandibular canal may increase susceptibility to nerve injury. The surgical technique and the handling of surrounding tissues are additional factors that may influence postoperative outcomes. Preoperative radiological assessment can help identify the anatomical relationship between the nerve and the planned osteotomy. Cone-beam computed tomography may provide useful information about mandibular canal position. Careful surgical planning is therefore important for reducing avoidable nerve trauma. Intraoperative awareness of nerve anatomy may contribute to safer surgical execution. Identification of potential risk factors supports individualized treatment planning and appropriate patient counseling.

Assessment of neurosensory function is necessary to determine the presence and severity of postoperative sensory changes. Evaluation should begin with a detailed history of the patient's symptoms. The clinician should identify the affected anatomical region and determine whether sensation is reduced, increased, or abnormal. Light-touch testing can help evaluate basic tactile sensitivity. Two-point discrimination may be used to assess the ability to distinguish two separate stimuli. Monofilament testing provides a structured method for measuring tactile thresholds. Additional sensory tests may evaluate responses to temperature or painful stimuli when clinically appropriate. Objective findings should be compared with the patient's subjective complaints. Recording preoperative sensory status provides a baseline for subsequent comparisons. Repeated assessments at scheduled postoperative intervals help demonstrate changes over time. Standardized testing improves consistency and facilitates comparison between clinical observations. Combining patient reports with objective sensory examinations provides a more comprehensive assessment of nerve function.

Recovery following postoperative neurosensory disturbances varies among patients. The duration of sensory impairment depends partly on the severity and type of nerve injury.

Temporary changes may resolve as inflammation decreases and nerve function gradually improves. More substantial nerve damage may require a longer recovery period. Follow-up examinations are important for identifying improvements or persistent abnormalities. A 2026 retrospective study of 579 orthognathic surgery cases reported that more than 85% of observed recoveries occurred within the first three months. By six months, recovery rates were 94.4% for infraorbital nerve disturbances following Le Fort I osteotomy and 92.9% for inferior alveolar nerve disturbances following sagittal split ramus osteotomy. These findings reflect the outcomes of the examined clinical cohort and should not be assumed to apply identically to every patient. The extent of jaw movement and the nature of nerve involvement may influence recovery. Age and anatomical characteristics may also be relevant prognostic factors. Regular assessment enables clinicians to identify patients whose recovery differs from the expected course.

Effective postoperative management requires systematic observation and individualized clinical decision-making. Patients should receive clear information about possible sensory changes before surgery. Postoperative examinations should document the affected region, symptom severity, and changes in sensory function. Comparison with baseline findings helps determine whether recovery is progressing. Persistent or worsening symptoms require further clinical evaluation. Management decisions should depend on the suspected type of nerve injury and the patient's clinical presentation. Supportive measures and specialist assessment may be considered when indicated. Evidence for specific treatments remains limited, and interventions should not be presented as universally effective. Patient education is important because sensory disturbances may affect eating, speaking, and everyday comfort. Regular follow-up also helps identify symptoms that require additional investigation. A standardized documentation approach can improve communication between clinicians and support continuity of care. Further prospective research is needed to establish consistent assessment protocols and determine the effectiveness of different treatment strategies. The overall goal is to preserve sensory function, support recovery, and improve patient satisfaction after orthognathic surgery.

Conclusion

Neurosensory deficits following orthognathic surgery remain an important clinical concern because they may affect facial sensation, daily activities, and patients' quality of life. Their severity and duration depend on anatomical characteristics, surgical techniques, and the extent of nerve involvement. Comprehensive preoperative assessment, careful surgical planning, and standardized postoperative sensory testing are essential for identifying these disturbances and monitoring recovery. Regular follow-up enables clinicians to evaluate changes in sensory function and recognize persistent abnormalities. An individualized approach to postoperative management may improve patient care and support better clinical outcomes. Further prospective studies are needed to establish standardized assessment protocols and evaluate effective strategies for preventing and managing neurosensory complications after orthognathic surgery.

References

1. Khatamov E. B., Shomurodov K. E. Comprehensive Treatment of Injuries to the Trigeminal Nerve Branches in Facial Fractures // World Bulletin of Public Health. - 2022. - Vol. 10. - P. 115–120.
2. Abdullaev A. S., Turopov F. R., Narzikulov D. K. Posttraumatic Neuritis of the Inferior Alveolar Nerve // Bulletin of New Uzbekistan. - 2023. - Vol. 1, No. 6
3. Narita M., Watanabe M., Okamura M., et al. Neurosensory Disturbances and Recovery

- Patterns in Orthognathic Surgery: A Retrospective Analysis of 579 Cases From a Tertiary Referral Center // Cureus. - 2026. - Vol. 18, No. 1.
4. Alolayan A. B., Leung Y. Y. Risk Factors of Neurosensory Disturbance Following Orthognathic Surgery // PLOS ONE. - 2014. - Vol. 9, No. 3. - Article e91055.
 5. Agbaje J. O., Salem A. S., Lambrichts I., Jacobs R., Politis C. Systematic Review of the Incidence of Inferior Alveolar Nerve Injury in Bilateral Sagittal Split Osteotomy and the Assessment of Neurosensory Disturbances // International Journal of Oral and Maxillofacial Surgery. - 2015. - Vol. 44, No. 4. - P. 447–451.
 6. Phillips C., Essick G. Inferior Alveolar Nerve Injury Following Orthognathic Surgery: A Review of Assessment Issues // Journal of Oral Rehabilitation. - 2011. - Vol. 38, No. 7. - P. 547–554.