Mandibular Canal: Navigating Dental Implant Placement Challenges and Enhancing Precision through Advanced Imaging and Surgical Techniques - A critical Review

Dr. Divyabharathi Selvam, MDS, (PhD) & Dr. Deepika Selvam, BDS

[1]Assistant Professor, Department of Prosthodontics, SRM Dental College, Bharathi Salai, SRM Ramapuram, Chennai, Tamil Nadu, India
[2]Tutor, SRM Dental College, Bharathi Salai, SRM Ramapuram, Chennai, Tamil Nadu, India

Email Id: serviceheb@gmail.com

ABSTRACT

Aim

To critically review the anatomical considerations of the mandibular canal in implant placement, focusing on advanced imaging and surgical techniques for precise positioning and navigation.

Background

The mandibular canal houses the inferior alveolar nerve, making it a critical landmark in implantology. Incorrect positioning relative to this canal can lead to complications such as nerve damage, leading to sensory disturbances. With advances in imaging and surgical technologies, there is a need to assess the current methods for identifying and navigating around the mandibular canal during implant placement.

Review Results

The review highlights that while traditional methods like panoramic radiography provide basic information, advanced imaging techniques such as CBCT (Cone Beam Computed Tomography) offer superior accuracy in identifying the mandibular canal's position. The integration of 3D printing and guided surgery has further enhanced precision in implant placement. However, variations in the anatomical course of the mandibular canal pose challenges that require individualized approaches.

Conclusion

Understanding the precise location of the mandibular canal is paramount in implantology to prevent complications. Although advanced imaging and guided techniques have improved the accuracy of implant

placement, challenges remain in standardizing these approaches. Future research should focus on developing more refined methods and technologies to further reduce the risk of nerve injury.

Clinical Significance

This review emphasizes the importance of accurate mandibular canal identification in implant placement, underscoring the need for practitioners to adopt advanced imaging and surgical planning techniques to minimize complications and enhance patient outcomes.