EDITORIAL

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The role of oral and maxillofacial surgeons in maxillary sinus diseases related to dental implants

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Maxillary sinus disease frequently develops in the oral and maxillofacial region and is classified as inflammation, cyst, benign tumor, and malignancy. Among them, inflammatory disease is the most common involving the maxillary sinus. Inflammation originates from infection or allergy and is divided into acute and chronic states. Generally, maxillary sinusitis is the result of non-odontogenic or odontogenic sources. Odontogenic origins are present in approximately 10% to 12% of all maxillary sinusitis cases[1]. More recent studies suggest a much higher incidence than previously reported, with chronic maxillary sinusitis comprising 30%-40% of all cases of sinusitis[2].

Sources of odontogenic infections that involve the maxillary sinus include dental caries, retained tooth roots, dentigerous cysts, acute and chronic periapical diseases, and periodontal disease. Infection and sinusitis may also result from trauma to the dentition or from surgery in the posterior maxilla including removal of teeth, alveolectomy, tuberosity reduction, sinus lift grafting and implant placement, or other procedures that create an area of communication between the oral cavity and the maxillary sinus. Maxillary sinus infections of odontogenic origin are more likely to be caused by anaerobic bacteria as typically seen with dental infections[3].

Otolaryngologists and medicinists have defined odontogenic sinusitis as an iatrogenic dental disease, but this is inaccurate based on the anatomy and physiology of the maxillary sinus[4]. Due to the variety of odontogenic diseases involving the maxillary sinus, from the lining of the sinus to the adjacent paranasal sinuses and dental tissues or from the adjacent bone with expansion into the sinus, the diagnosis of odontogenic maxillary sinusitis remains complex.

At the 2021 International Forum of Allergy and Rhinology, an international multidisciplinary consensus statement for diagnosing odontogenic sinusitis was presented. As background of this consensus, if patients present initially to otolaryngologists, their clinical presentations can mimic non-odontogenic rhinosinusitis, and odontogenic sources may not be suspected. In conclusion, diagnosis of odontogenic sinusitis generally requires confirmation of maxillary odontogenic pathology. Both dental providers and otolaryngologists should suspect odontogenic maxillary sinusitis based on certain clinical features and refer patients to appropriate providers for disease confirmation[5].

Oral and maxillofacial surgeons can perform diagnosis of odontogenic maxillary sinusitis. A simple method of diagnosis could contribute to decreased medical care costs and patient time and could prevent confusion and miscommunication between dental providers and otolaryngologists or between patients and clinicians. In addition, radiographic images such as panoramas and cone-beam computed tomography (CBCT) scans frequently used in oral and maxillofacial surgery can help with the diagnosis of odontogenic maxillary sinusitis. Identifying the relationship between odontogenic and sinus pathologies is essential to establish the correct diagnosis and management of the patient. For this, the provider should use adequate and high-precision diagnostic methods. CBCT imaging is capable of providing three-dimensional images with high quality using a lower radiation dose at a lower cost compared with multi-slice computed tomographic imaging[6]. CBCT imaging allows identification of changes in the maxillary sinus and their potential causes as well as the relationship between the maxillary sinus and adjacent teeth

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and is the ideal examination tool for assessing patients who have both dental and sinus complaints[7].

If otolaryngologists overlook a dental source of maxillary sinusitis, patients may suffer unnecessarily from ongoing dental or sinus symptoms. Due to the variety of dental sources in maxillary sinusitis, different treatments are available. As an anatomical feature of the maxillary sinus, various operating methods through intra-nasal or intra-oral approaches exist. In maxillary sinusitis related to dental implants, delicate management must be considered for retention of implant fixtures or the possibility of re-implantation after treatment of sinusitis.

For example, displacement of dental implants into the maxillary sinus is one challenge of treatment. Although transnasal endoscopy or functional endoscopic sinus surgery, frequent in otolaryngology, can be used to widen a narrowed or blocked ostium and remove an implant fixture, surgical forceps cannot easily remove a displaced implant due to its location and angle. The Caldwell-Luc approach (intra-oral approach) has been used to remove displaced implants in many studies. This approach enables a very wide view and is useful for removing objects not suitable for endoscopy because of their size or excessive displacement. Occasionally, for reducing injuries or bleeding in the mucosa, facilitating recovery, and preserving mucociliary function, the Caldwell-Luc approach can be used in combination with endoscopy[8]. If implant displacement has created an oroantral fistula, an intraoral approach such as a buccal flap, palatal rotational flap, or buccal fat pad flap is essential for closure.

Oral and maxillofacial surgeons can operate on odontogenic maxillary sinusitis using approaches such as endonasal endoscopy, transoral endoscopy, and an intra-oral surgical approach. These techniques cannot only help to treat sinus diseases, but also to maintain the mucosa and function of the maxillary sinus. Therefore, sinus lift with bone graft and implant fixation could be performed successfully again.

Anatomically, the maxillary sinus is associated closely with maxillary teeth and surrounding tissues. Recently, the number of cases of sinus lift with bone graft for dental implant placement in the maxilla has gradually increased. Although the lateral window and crestal approaches are safe and predictable procedures in regions close to the maxillary sinus, complications associated with these procedures are not uncommon. Historically, the treatment of maxillary sinus diseases is one of the main aspects of oral and maxillofacial surgery. Oral and maxillofacial surgeons can identify dental sources or dental implant sources of odontogenic maxillary sinusitis and accurately diagnose maxillary disease. Oral and maxillofacial surgeons can provide treatment options for maxillary diseases associated with dental implants and provide opportunities to maintain the placement of dental implants or bone grafted states and to repeat implant surgery or sinus lift with bone graft based on understanding of dental implant procedures and bone materials.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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