



CLINICAL ASPECTS AND ALLERGOLOGIC STUDY OF ODONTOGENIC MAXILLARY SINUSITIS: COMPLICATIONS RESULTING FROM DENTAL TREATMENT

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ABSTRACT

Odontogenic rhinosinusitis is a relevant infectious condition of the paranasal sinuses. The purpose of this paper is the anatomical relationship between the dental region and the maxillary antrum, ethmoidal sinus and frontal sinus. The widespread use of dental implants and reconstructive procedures for their positioning has led to an increase in Sinonasal Complications of Dental Disease and Treatment (SCDDT). Overall patients were included in the study, they have been classified as odontogenic disease affecting the paranasal sinuses and integrated into a study group based on the pathogenesis and clinical aspects of each case, allergy evaluation including Patch test dental testing nasal endoscopy and Cone-Beam computed tomography with the aim of identifying homogenous treatment groups. Management of odontogenic sinusitis needs to be tailored to each individual patient and involves varying combinations of medical management, allergist, dental surgery, and ENT surgeon.

KEYWORDS : Odontogenic maxillary Sinusitis, Chronic Rhinosinusitis, Sinonasal Complications of Dental Disease.

INTRODUCTION

The widespread use of dental implants and reconstructive procedures for dental implant placement evidenced new types of complications as chronic rhinosinusitis, secondary to allergic reactions to the implant materials, to infective agents in the maxillary sinuses. In such cases, the diagnosis is frequently delayed and patients are evaluated by different specialists, including allergists.⁽¹⁾ Chronic maxillary sinusitis of dental origin may be caused by chronic oro-antral fistulae, foreign bodies (teeth roots, dental fillings or endodontic materials, parts of broken instruments, implants) pushed into the maxillary sinus, odontogenic cysts occupying partly or totally the maxillary sinus, or inflammatory cysts from the premolar and molar teeth.^(2,3) When treating maxillary sinusitis, it is important to consider the disease history, including symptoms, causative factor, history of surgery, with the radiological findings and histological examination. Sinonasal complications of dental disease and treatment (SCDDT) deserves special consideration because it differs from other form of rhinogenous sinusitis in terms of pathophysiology, microbiology, diagnosis and management.⁽⁴⁾ Different aspects are included in this study, classified as odontogenic disease affecting the paranasal sinuses post-dental implantation and thus integrated into a classification system based on the pathogenic, specific allergies and hyper-reactivity, clinical aspects and imaging finding of each case, with the aim of identifying homogenous treatment group, with the aim of identifying homogenous treatment groups.

MATERIALS AND METHODS

A total of 35 patients, 20 males and 15 females, with a mean age of 56,4 years and the mean follow-up period was 9,1 months, were retrospectively studied. Each patient underwent chart and imaging review by computed tomography (CT) scan showing dental pathology, analyze demographic factors, diagnostic criteria, clinical course, and management. All patients included in this review study had an ascertained the odontogenic disease affecting the paranasal sinuses and were integrated into a study group based on the pathogenesis and clinical aspects of each case, with the aim of identifying homogenous treatment groups. Each patient underwent a careful clinical history, examination and imaging review by CT scan showing dental pathology and none of these Magnetic Resonance Imaging performed. In addition, all patients underwent an allergologic study by the application of patch epicutaneous test with dental standard series and metals standard series (*Lofarma Allergeni, Milan, Italy*) in order to exclude an allergic sensitization to the materials used during dental sessions. Overall patients were included in the study, they have been classified as odontogenic disease affecting the paranasal sinuses and integrated into a study group based on the pathogenesis and clinical aspects of each case, with the aim of identifying homogenous

treatment groups. Exclusion criteria are the invasive mycoses of the paranasal sinuses, mucocelles and tumors.

RESULTS

Result were evaluated for each group (35 patients): 6 patients (17,5%) presented patch positive Nickel Sulfate, 2 patients (5,7%) positive to Cobalt Chloruro, 2 patients (5,7%) positive to Chromium Sulfate, and 1 patient (2,8%) patient positive to Palladium Chloride. The other test with dental standard series and metals standard series are negative results. Besides from the analysis radiological was born the following classification: 15 patients (42%) group I, presented mucosal thickening on the protrusion of an implant fixture into the sinus, dental implants protrude into the maxillary sinus, bone levels should be stable with no evidence of peri-implant platform or periapical radiolucency; 8 patients (22%) patients, group II, (**Fig.1**) presented odontogenic maxillary sinusitis occupying complete the maxillary sinus, bone levels should be stable with no evidence of peri-implant platform or periapical radiolucency. Coronal CT scan showing complete obliteration of the left maxillary sinus, radiodense material and erosion of bone in the right maxillary sinus with obstruction of the ostiomeatal complex; 7 patients (2,8%), group III (**Fig. 2**), presented left nasal obstruction, coronal CT scan showing complete obliteration of the left maxillary sinus and the anterior ethmoid cells as well as the obstruction of the frontal recess. The more common causes of maxillary sinusitis related to dentistry include perforation of the sinus membrane the sinus during fixture placement and extrusion of materials into the sinus during root canal therapy and 5 (1,4%) patients, group IV (**Fig. 3**), with odontogenic maxillary sinusitis due to a perforation of the sinus membrane during dental implant displacement, coronal CT scan showing complete obliteration of the left maxillary sinus and the anterior ethmoid cells as well as the obstruction of the frontal sinus.⁽⁵⁾ The exposure of implants inside the nasal cavity can induce rhinosinusitis, an implant exposed in the nasal cavity can alter flow within the nasal cavity and induce inflammation of the nasal cavity mucosa. Cone-Beam CT images shows the displaced root within the alveolar part of the maxillary sinus and associated sinus mucosal tickening.⁽⁶⁾ To determine whether the deposition of foreign materials increases with time and whether increased deposition within the maxillary cavity causes inflammation, long-term studies are required. We observed that when the implant exposed in the maxillary cavity was not covered by the maxillary sinus membrane, foreign material was deposited on the exposed implant surface. This is thought to induce acute and chronic maxillary sinusitis.⁽⁷⁾ Groups II, III e IV submitted to concurrent Functional Endoscopic Sinus Surgery (FESS) and dental surgery.

DISCUSSION

Determining the primary site of disease in these cases still represents a diagnostic dilemma from both clinical and radiographic standpoints. Chromium, Palladium, Cobalt and Nickel are responsible for contact dermatitis, that is largely prevalent in the general population. They can act also as irritants in the upper and lower respiratory airways, also rhinitis (allergic and nonallergic) is a high prevalence disorder. Radiographic examination of the maxillary sinus and adjacent dental structures revealed three types: a roots of a tooth, and if dental implants protrude into the maxillary sinus; the second type: dental periapical abscess chronic apical revealed rounded lucency and three condition: maxillary sinusitis due to a displaced, other cause include perforation of the sinus membrane during tooth extraction.⁽⁶⁾ The maxillary sinus becomes more closely associated with the teeth and consequently is more readily injured by odontogenic infection, surgical procedure and trauma. By computer tomography data, all the sinusitis were divided into four groups by sinus location: alveolar process, maxillary sinus, ethmoidal sinus and frontal sinus.⁽⁹⁾ This division is important for the symptoms with evident paranasal sinuses involvement. Anatomic area and symptoms are strictly connected: alveolar recess with pain in the zygoma area, maxillary sinus with nasal obstruction, ethmoid sinus with hypo-anosmia-cacosmia and frontal sinus with headache. The Cone Beam study of the paranasal sinuses and nasal fossae if possible, with direct (4-5mm) contiguous coronal sections and completed with axial sections, this permit a precise analysis of the extent of the area affected. It is, therefore, a form of exploration supplementary to endoscopic study but is of paramount importance as part of the pre-surgical study. Endoscopy should be considered not only for intraoperative observation and assessment of implant sites, but also should be applied for active assistance during implant placement procedures.⁽¹⁰⁾

CONCLUSIONS

When treating maxillary sinusitis, it is important to consider the disease history, including symptoms, causative factors, and history of surgery, together with the radiological findings and histological examination. Odontogenic sinusitis is a well-recognized, but understudied form of sinusitis.⁽¹¹⁾ The purpose of this article is to present a classification and standardized treatment in patients with odontogenic sinusitis.⁽¹²⁾ The Functional Endoscopic Sinus Surgery demonstrates extremely few complications and a low morbidity rate. Endoscopic transnasal surgery for the odontogenic maxillary sinusitis is less invasive than conventional dental approach, and most of the affected teeth can be preserved. Endoscopic diagnostic, rhinological evaluation, allergy evaluation in conjunction with Cone Beam Computed Tomograph (CT), have proved to be an ideal combination.



Fig. 1. Male, 49 ys, right nasal obstruction. Coronal CT scan showing complete obliteration of the right maxillary sinus with radiodense material and erosion of bone in the right maxillary sinus with obstruction of the ostiomeatal complex. *Patch test dental panel: Nickel sulfate.*



Fig. 2. Female, 57 ys, left nasal obstruction, cacosmia, pain in the left zygoma area. Coronal CT scan showing complete obliteration of the left maxillary sinus and the anterior ethmoid cells as well as the obstruction of the frontal recess with radiodense material in the left maxillary sinus with osteometal complex blocked. *Patch test dental panel: Palladium Chloride*



Fig. 3. Female, 62 ys, right nasal obstruction, pain and headache in the right frontal sinus. Coronal CT scan showing complete obliteration of the right maxillary sinus and the anterior ethmoid cells as well as the obstruction of the right frontal sinus. *Patch test dental panel: negative..*

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