SMART DENTAL UPDATES

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Dear Doctor,

Greetings from Micro Labs Limited. We are happy to bring you **"SMART DENTAL UPDATES"** which contain latest and interesting news in the field of Dentistry.

This issue contains:

- The Effect of a Periapical Lesion on Sinus Healing After Endodontics
- Effects of deviated nasal septum and missing teeth on maxillary sinus volume.
- Variations in the Mandibular Canal and Mental Foramen on Cone-Beam Computed Tomography Images
- Gingival recession, gingival stillman's cleft, bony exostosis, and denture stomatitis in a maxillary lateral incisor: a case report with a 3-year follow-up

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Looking forward to your valuable feedback

Best Regards,
Medical Team, Micro Labs Limited

The Effect of a Periapical Lesion on Sinus Healing After Endodontics

Introduction:

Asymptomatic or symptomatic changes in the maxillary sinus may occur. In the case of an asymptomatic course, no treatment is indicated. During a dental visit, these alterations are frequently discovered by mistake during a three-dimensional (3D) radiographic examination. [1] Odontogenic alterations in the maxillary sinus are reduced by addressing the underlying cause, such as endodontic therapy or tooth extraction, among other options. The prompt elimination of the source of the infection is ensured via tooth extraction. [2] The elimination of the cause, i.e., the removal of the causative tooth or its root canal treatment, followed by observation of the healing phase, is the first step in treating acute maxillary sinusitis. Chronic diseases need the use of laryngologist surgery. Depending on the treatment procedure, this necessitates access to the maxillary sinus via the alveolar bone or the anterior nostrils. Gaining access to the maxillary sinus, removing its contents together with a portion of macroscopically altered mucosa, and widening the nasal outflow aperture in the medial wall constitute surgical therapy.

To establish the best course of therapy for odontogenic maxillary sinusitis, a dentist and a laryngologist expert must work closely together. [2]

Methods:

Three-dimensional (3D) computed tomography scans were analysed before and after endodontic treatment to quantify the thickness of the Schneider membrane in a retrospective documentation study of root canal procedures. The research included 45 endodontically treated patients ranging in age from 21 to 62 years old. When the Schneider membrane was thicker than 2 mm, it was assumed that the maxillary sinus was inflamed.

Results:

Three-dimensional (3D) computed tomography scans were analysed before and after endodontic treatment to quantify the thickness of the Schneider membrane in a retrospective documentation study of root canal procedures. Forty-five endodontically treated patients, ranging in age from 21 to 45.

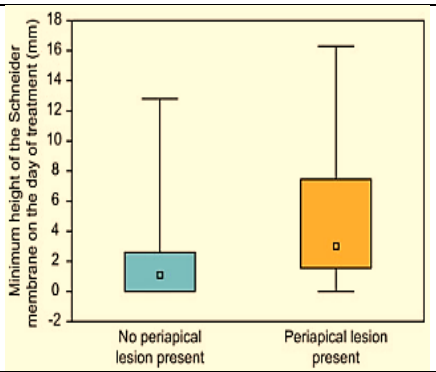

Fig 1. Minimum height of the Schneider membrane on the day of treatment (mm)

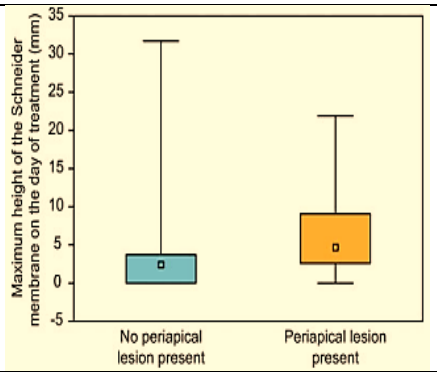

Fig 2. Maximum height of the Schneider membrane on the day of treatment (mm)

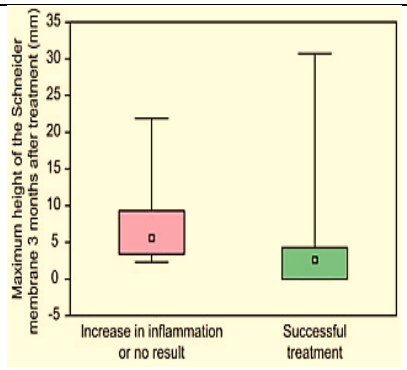

Fig 3. Maximum height of the Schneider membrane 3 months after treatment (mm).

Only three of the 12 comparisons between variables were significant. The treatment outcome (reduction in maxillary sinus inflammation 3 months after treatment) and the

maximal height of the Schneider membrane were shown to be related (Fig 1 & 2). A link was found between the existence of a periapical lesion and the lowest height of the Schneider diaphragm, as well as the presence of a periapical lesion and the maximum height of the Schneider diaphragm (Fig.3)

Discussion:

Endodontic therapy, when done correctly, allows the source of inflammation to be removed from the causative tooth as well as the surrounding tissues, such as the bones, gums, and maxillary sinus. [3] Secondary endodontic therapy has been linked to lower success rates than initial endodontic treatment; secondary treatment may affect the healing process in the surrounding tissues, such as the maxillary sinus. Different bacterial flora in the root systems of teeth that have been endodontically treated might also impact an unfavourable healing phase. [4] The process in the maxillary sinus was unaffected by patient-related characteristics such as sex or age. The age of the individual receiving treatment may affect the healing process since healing ability reduces with age; however, this study observed no effect of age or gender on the procedure in the maxillary sinus. [5] After three months, there was a noticeable reduction in sinus inflammation, and computed tomography scans of the afflicted area are recommended to monitor the odontogenic sinus inflammation healing process. [6]

Conclusion:

The fact that the periapical lesion has no effect on the healing process in the maxillary sinus, and that the healing process can be diagnosed on X-ray examinations 3 months after the end of endodontic treatment, rather than 6 months as in the case of periapical lesion observation, is a significant finding. In the absence of the healing process, a shorter wait for the test result and monitoring of the healing process allows the dentist to make a faster judgement regarding the necessity for a laryngologist consultation. The findings of the study show that treating maxillary sinus irritation requires collaboration between a dentist and a laryngologist.

The inflammation of the maxillary sinus is reduced three months after primary and secondary root canal treatments on maxillary premolars and molars.

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Effects of deviated nasal septum and missing teeth on maxillary sinus volume.

Introduction:

The reason for tooth extraction and the projection of the tooth roots into the maxillary sinus is said to greatly reduce the bone height from the alveolar ridge to the maxillary sinus floor, while missing teeth is said to cause the maxillary sinus to expand, both of which are important considerations during dental implant treatment for the maxillary molar region. [1] As a result, patients frequently require maxillary sinus augmentation, which was found to be exceedingly effective in 94.9–100% of instances in a comprehensive evaluation, regardless of implant type. [2]

Methods:

Tooth extraction and root projection into the maxillary sinus have been shown to significantly reduce bone height from the alveolar ridge to the maxillary sinus floor, while missing teeth have been shown to cause the maxillary sinus to expand, all of which are important considerations during maxillary molar dental implant treatment. As a result, before to sinus augmentation, it's critical to analyse the anatomical aspects of the maxillary sinus that might cause complications. We looked examined the impact of missing teeth and nasal septal deviation (NSD) on maxillary sinus volume in three dimensions (MSV). Participants were chosen from patients who had two or more missing teeth and had their maxillary sinus augmented for a unilateral free-end saddle. Cone-beam computed tomography was used to determine the MSV and NSD (CBCT). The Wilcoxon t-test was used to compare the presence/absence of teeth and NSD with MSV in each patient on a bilateral basis. Axial images were exported with a 512×512 matrix as a single frame for each DICOM file (Fig. 1)

Results:

There were 30 patients in this research (30 sinuses; 12 men, 18 women). The average age of the patients was 58.210.12 years. Thirteen individuals had two missing teeth on average, whereas seventeen had three or more missing teeth.

NSD was found in nine individuals (30%). MSV was 21.503.84 cm^3 and 22.103.56 cm^3 on the ipsilateral and contralateral sides of the NSD, respectively; hence, NSD had no effect on MSV (p=0.150). The mean MSV on the edentulous and non-edentulous sides

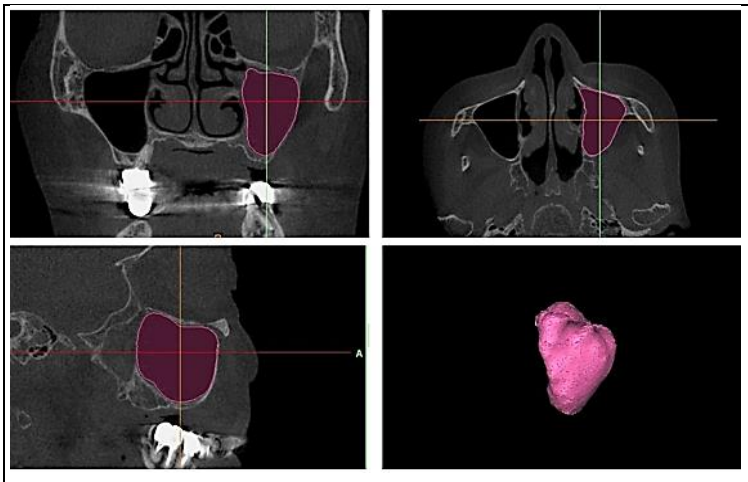

Fig 1. Method for measuring MSV. Upper-left: Visualization of the maxillary sinus in the coronal plane. Lower-left: Visualization of the maxillary sinus in the axial plane. Upper-right: Visualization of the maxillary sinus in the sagittal plane. Lower-right: Visualization of the maxillary sinus in three dimensions. MSV maxillary sinus volume

was 21.583.89 cm^3 and 21.774.30 cm^3, respectively, indicating that the MSV on the edentulous side was much less.

Discussion:

In maxillofacial surgery, the maxillary sinus is an important anatomical feature. There have been few reports on the effect of the presence or absence of a deviated nasal septum, polyp formation in the maxillary sinus, the presence or absence of a septum, and the influence of bone head height on maxillary sinus volume because previous studies have mainly focused on the condition of the maxillary sinus floor with respect to maxillary implants. [3] The nasal septum is a bone and cartilage structure that divides the nasal cavity on both sides. While a completely straight nasal septum is exceedingly unusual, NSD is claimed to affect 20–79 percent of people. Patients with sinusitis had significantly deviated nasal septa.

In contrast, a research indicated that the volume of the maxillary sinus was less in totally and partially edentulous individuals than in dentate patients, owing to the absence of stimulation of the maxillary bone. A comparison of the MSV on the edentulous and non-edentulous sides among individual patients indicated that the MSV on the edentulous side was much lower. Although we compared MSV within each individual in unilateral partly edentulous individuals, the results were comparable to the current study. [4] The study evaluated variations in sinus volume owing to tooth loss across the same participants in our study, which set it apart from prior investigations. As a result, we concluded that the decline in sinus volume was not attributed to ageing. Rather, the absence of stimulation of the maxillary bone was to blame for the decline. Furthermore, although it was not part of the inclusion criteria, the fact that all of the target patients had their teeth extracted within one year of each other may have influenced the study's outcomes. This was a pilot research that solely looked at preoperative CT for maxillary sinus augmentation.

Conclusion:

Using three-dimensional CBCT measurements of the maxillary sinuses in partly edentulous individuals, MSV was not related with NSD but was considerably decreased due to missing teeth.

Although this was a small preoperative investigation, three-dimensional maxillary sinus assessment with CBCT in partly edentulous individuals demonstrated that missing teeth resulted in significant decreases in MSV, although NSD did not.

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Variations in the Mandibular Canal and Mental Foramen on Cone-Beam Computed Tomography Images

Introduction:

For dental implant applications, endodontic treatments, and surgical interventions, the mandibular canal (MC) including the alveolar nerve, artery, and vein, as well as the mental foramen (MF) located on the lateral aspect of the MC, should be discovered. The MC has a markedly different course of expansion, according to anatomical and radiological research. During the final stages of embryonic development, the three inferior dental nerves that innervate the mandibular teeth are fused together. [1] Panoramic and periapical radiographs, which are commonly utilised in dentistry, are frequently insufficient to detect changes. Cone-beam computed tomography (CBCT) has gained popularity in dentistry in recent years since it emits less radiation and takes up less space than other computed tomography (CT) scans. [2]

Methods:

Retrospective evaluation of CBCT pictures (n = 459) was performed. The final sample included 362 CBCT pictures from 152 men and 210 women ranging in age from 10 to 87. The presence and localizations of MC and MF variants were assessed. SPSS version 20 was used to analyse the data. A panoramic imaging mode was used to examine the images sectionally in order to determine the absence of BMC, TMC, AMF, and MF (Fig. 1).

Results:

The average age of the participants was 38.79 16.45 years. A total of 57 photos (15.7%) had MC and MF variances. Bifid MCs (13%) were seen in 47 pictures, whereas accessory mental foramen (AMF) were seen in 14 (3.9%) and trifid MCs were seen in just five (1.4%). In one photograph, MF was not present (0.3 %). The prevalence of AMF was shown to be higher in younger patients statistically (7.9 %).

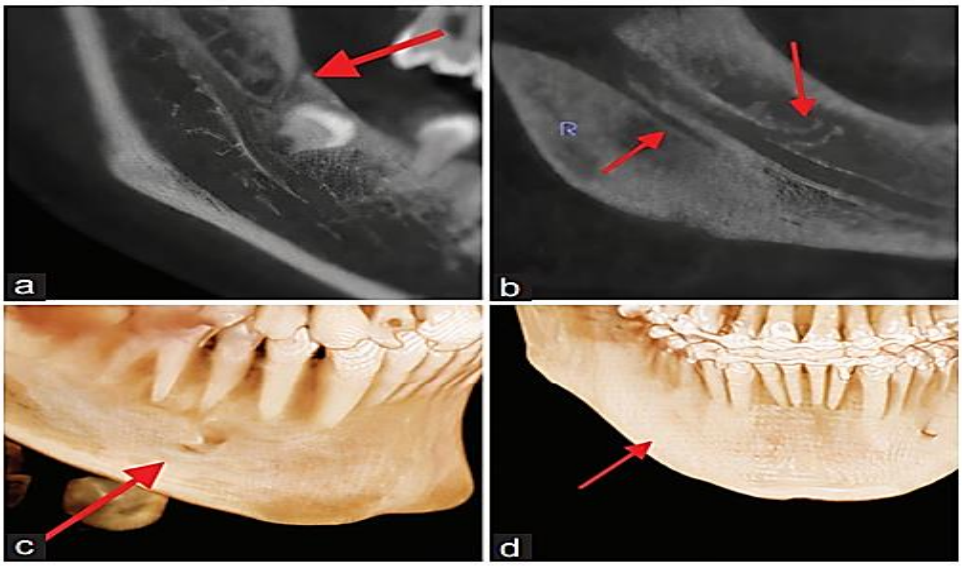

Fig. 1 Variations in cone-beam computed tomography Images; (a) bifid mandibular canal, (b) trifid mandibular canal, (c) accessory mental foramen, (d) no mental foramen

Men were more likely than women to have BMCs and AMF. AMF images revealed unilateral placement, especially on the right side.

Discussion:

Condensation on radiographs or elevation of the mylohyoid muscle insertion parallel to the internal surface of the mandible may also limit the detection of the mandibular boundary contour and, as a result, MC changes. According to the literature, CT and CBCT had equivalent results in the diagnosis of the maxillomandibular region, and CBCT had several advantages over CT, including a lower radiation dose, more accessible equipment, and better bone tissue imaging. [3]

BMCs were seen in 47 of the pictures, which is similar with what has been observed in CT investigations. BMCs were found to be 19 percent in Belgium, 16.2 percent in Korea, 22.8 percent–36.8 percent in Spain, 18,4 percent–46.5 percent in Turkey, and 15 percent–56.5 percent in Japan in multiple CBCT studies. The prevalence of BMC (13%) was found to be lower in the Turkish population in this study than in earlier CBCT studies. This could be related to differences in population sizes and regional differences. [4] The varied research demographics, imaging technology quality, and radiographic assessment could all explain the different results. The prevalence of AMF was shown to be higher among younger patients in this investigation, with no significant differences between age groups and BMC, TMC, or the lack of MF. The prevalence of BMC, on the other hand, was shown to be higher in the older age group. [5]

Conclusion:

Males had more MC and MF variants, and involvement was more common on the right side. Younger patients were shown to have a higher prevalence of AMF. Neurosensory problems like bleeding, traumatic neuroma, paraesthesia, and paralysis can be avoided if high-risk patients and variations are identified early. In the study of MC and MF changes, CBCT is a very helpful imaging modality. To avoid potential difficulties, dentists should be aware of these variances. Variations may not always be identified using panoramic imaging as the first imaging method. CBCT should be employed as a form of advanced imaging in questionable circumstances.

Males were more likely to have variations, and participation was more prevalent on the right side. Neurosensory problems such as bleeding, traumatic neuroma, paraesthesia, and paralysis can be avoided if high risk individuals and variants are identified early.

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Gingival recession, gingival stillman's cleft, bony exostosis, and denture stomatitis in a maxillary lateral incisor: a case report with a 3-year follow-up

Introduction:

Gingival recession is described as the apical displacement of the free gingival edge, which exposes the root surface. Gingival loss can lead to aesthetic issues, oral hypersensitivity, and non-carious cervical lesions. Furthermore, the quantity of keratinized soft tissue is linked to gingival inflammation and plaque management. [1] To achieve root coverage and promote keratinized soft tissue, many surgical procedures have been devised. Among them, the combination of coronally advanced fap (CAF) and connective tissue graft (CTG) has shown the most acceptable and predictable results, particularly in long-term follow-up. [2]

Case Report:

A 27-year-old non-smoker female with mild gingival recession and gingival stillman's cleft of the maxillary left incisor presented with these symptoms (Fig. 1). Her main complaint was the loss of her left maxillary incisor, and she desired a denture. The periodontal clinic was directed to the patient for assessment and treatment of the mucogingival problem. The lateral incisor was classified as type I of Miller's classification, also known as Cairo RT1 with sufficient keratinized gingival keratinization in the apical region In addition to the gingival recession, there was a stillman's gingival cleft in the centre of the gingival edge, which was categorised as a "total white gingival cleft." Furthermore, a bone exostosis was seen apical to the gingival gap. The lateral incisor was properly positioned in the dentition and did not move. The periapical radiograph revealed no evidence of interproximal alveolar bone resorption (fig.2).

Fig. 1 A gingival recession of Miller type I (Cairo RT1) combined with a gingival stillman's cleft (white arrow) in left maxillary lateral incisor

Fig. 2 Periapical, sagittal and axial CBCT imaging. a No obvious interproximal alveolar bone resorption. b Area of bony dehiscence (black arrow) and bony exostosis (white arrow). c A bony exostosis in the cross section of cone beam CT (white arrow)

She previously had a removable denture, but it made her feel uneasy, so she ditched it. She had no medical contraindications to periodontal surgery. The treatment approach was designed to provide total root covering as well as soft tissue augmentation. After signing a written permission, non-surgical periodontal treatment was performed, which included dental hygiene teaching as well as supra and subgingival scaling. She was also

taught how to maintain her dental hygiene at home. According to the consensus, she was told that the tooth had a good prognosis because there was no major interdental bone loss.

Following the administration of local anaesthetic, the gingival cleft was entirely excised; ten a split-full-split partial thickness fap was made to expose the bony exostosis in the apical area, and the bone exostosis was decreased away by the hand-piece, the keratinized gingiva of the hard palate was trimmed to 1.2–1.5 mm thick; the sub-epithelial CTG was placed on the root surface 1–2 mm coronal to the cementoenamel junction (CEJ) and stabilised to the periosteum by simple suture with 6-0 suture; the partial fap was coronally advanced to cover the CTG and fixed with the papilla by sling suture with 5-0 suture

The patient was given antibiotics for 5 days and instructed to use chlorhexidine rinse for 2 weeks. The sutures were removed after 14 days, and she may brush the surgical region with a very gently rolling motion until then refused a dental implant due to budgetary constraints and surgical apprehension When the patient returned to the periodontal clinic one year later, the free gingival margin was still stable as in the post-surgery state, with a thicker biotype matching to the grafted region. She was pleased with the gingiva and the appearance of the denture, but she was unhappy with the swelling and bleeding around the incisors. Clearly, there was denture stomatitis.

Fig.3 A stable gingival margin and a satisfactory outcome after 3 years

Fig 4. A casting denture without acrylic base around the gingival margin

It was assumed that the patient was allergic to the acrylic in the denture, thus a replacement denture with a casting palatal plate was constructed following a conversation with the prosthodontics (fig 4). The patient returned once more. Three years after the procedure. The gingival margin remained steady, and the shape was likewise acceptable. The problem was addressed, and it did not reoccur, and the surrounding gingiva showed shallow probing depths and no bleeding on probing.

Discussion:

The CAF method, along with a CTG, has shown to be the gold standard for root coverage. It has the potential to improve soft tissue thickness while still maintaining root coverage. This approach was capable of achieving long-term stability, and the case with the best results after three years of follow-up strongly supported the conclusion. According to Miller's categorization, Class I recession might be accomplished with total root coverage using a variety of techniques, including CAF+CTG. [3] Stillman's cleft is a triangular-shaped mucogingival imperfection on the buccal surface of a root. A study described

examples of stillman's cleft treated with CAF+CTG that yielded positive effects. Sometimes tunnel procedure with CTG is more micro-invasive with no vertical incisions certain particular considerations. [4]

Conclusion:

The gingivitis vanished once a new denture was made (fig 3). Because there was no acrylic material along the gingival border, it was more suited to maintaining gingiva health. We observed appropriate tissue enlargement as well as the re-establishment of the native profile of the damaged gingiva throughout this 3-year follow-up. In conclusion, even when there was an extra gingival cleft and denture stomatotitis, the conventional surgical procedure of CAF coupled with CTG may yield a satisfying and stable result for a long period. The biotype enhancement of gingiva was the primary cause for long-term stability, and prosthesis design may also be crucial.

Coronally advanced fap paired with connective tissue graft method is a traditional way to treat gingival recession, particularly for long-term stability, even when there is a gingival stillman's cleft, bony exostosis, and denture stomatitis.

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