



# SMART DENTAL UPDATES

Vol 2 | Issue 24 | 2021

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 contain

- Immediate Implant placement following tooth extraction with simultaneous Lateral Sinus Augmentation
- Effects of Remote Digital Monitoring on Oral Hygiene of Orthodontic Patients
- Cervicofacial Subcutaneous Emphysema following Dental Procedure

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Looking forward to your valuable feedback

Best Regards,  
Medical Team, Micro Labs Limited



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## Immediate Implant Placement following Tooth Extraction with Simultaneous Lateral Sinus Augmentation

In rehabilitation of the posterior maxilla with implant-supported restoration, insufficient residual bone height is a common problem encountered. The solution to the problem of a lack of bone height is surgical sinus augmentation procedure. This method has proved to be highly efficacious and predictable.

The objective of this study was to demonstrate for at least 1 years radiologic and clinical results after

loading in subjects who underwent tooth extraction, implant placement, and lateral sinus augmentation at the same time.

Immediate implant placement following tooth extraction with simultaneous lateral sinus augmentation is considered reliable.

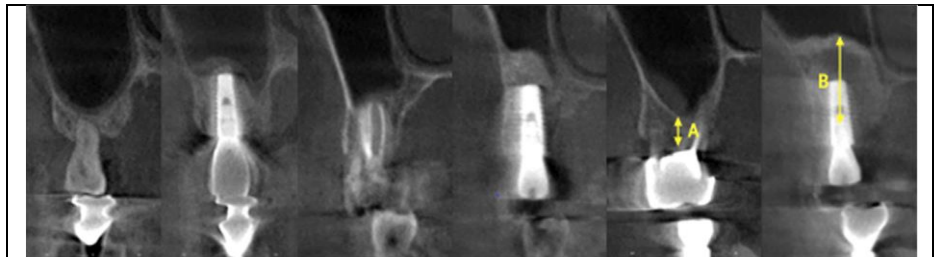
This study retrospectively evaluated 25 subjects aged 38 to 78 years. To evaluate the residual bone and sinus pathologies preoperative panoramic radiographs and cone-beam computerized tomography (CBCT) were taken. Cases of chronic periodontitis, deep caries, root rest, tooth fracture, and/ or failure of endodontic treatment were included in this study. Operation was carried out under local anesthesia. Sulcular incision was made on the tooth to be extracted and a mesial and distal vertical releasing incision was made. To expose the bone the flap was elevated carefully and extended labially. During extraction careful application of elevators and forceps was carried out. On the extraction socket curettage and irrigation was performed after extraction. To allow for the placement of implants into the bone chamber the floor and lateral, medial and posterior walls of the sinus membrane were meticulously detached and pushed upward. The implant was positioned from the crestal bone and extended into the sinus. Two submerged implant systems were used. The bone graft material used was a mixture of demineralized freeze dried bone allograft and bovine bone xenograft. With a hand



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toque wrench initial stability was measured. Incision line was sutured by 5-0 nylon. The subject received cephalosporins antibiotics of



Cone-beam computerized tomography (CBCT) of patient shown in Figs. 2 and 3. A Residual bone height. B Increased bone height

secondary generation, non-steroidal antiinflammatory drugs and 0.1% chlorhexidine for 5 days after the surgery and the suture was removed 7 days after the surgery. The surgery proceeded via either a 1-stage (17 implants) or a 2-stage (18 implants) procedure. Implant Stability Quotient (ISQ) values were measured by Osstell Mentor. Subjects did not developed maxillary sinusitis or infection. In two subjects sinus membrane perforation occurred and was repaired by application of a bioresorbable collagen membrane. Due to a failure of osseointegration, one implant was removed 3 months after implant placement. It was replaced without additional bone grafting after a 3-month healing period and reloaded 5 months later. The remaining 34 implants healed well. The implants were in a healthy condition after at least 1 year of follow-up after loading the implant and effectively supported the prosthesis. The failure-free survival rate was 97.06% at 1 year. Initial torque was 30.14 N/cm and ranged from 15 to 35. Among the residual bone height, initial torque value, ISQ, treatment period, final bone height, and failure evaluation by stage of implant placement, ISQ showed statistical significance between the groups. Each value among the groups tended to increase, but there was no statistically significant differences.

In conclusion, within the limitation immediate implant placement following tooth extraction with simultaneous lateral sinus augmentation is considered reliable even though the procedures had been performed at the same time.

Reference: Kim BJ, Kim CH, Kim JH. Immediate implant placement following tooth extraction with simultaneous lateral sinus augmentation: a retrospective clinical study after at least 1 year of loading. International Journal of Implant Dentistry. 2021 Sep;7(1):1-0.

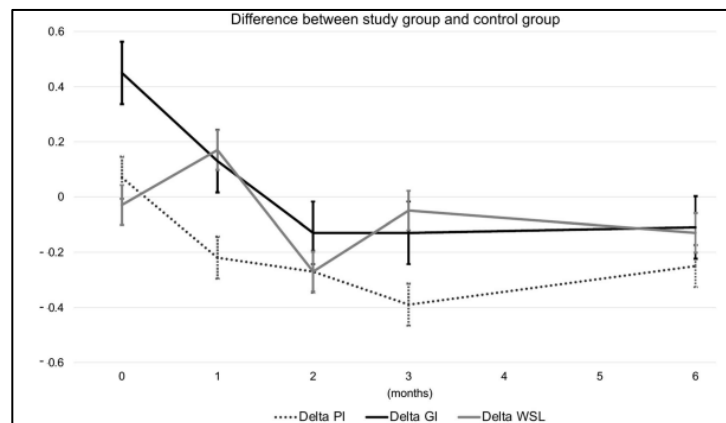


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## Effects of remote digital monitoring on oral hygiene of orthodontic patients

In patients undergoing orthodontic treatment oral hygiene should be routinely controlled. During orthodontic treatment remote digital monitoring can help subjects in improving their oral hygiene. Dental plaque on the tooth surface for a long time period can increase the chance of demineralization and white spot lesions along with gingival inflammation. This can negatively affect the clinical outcome due to possible discontinuation of the orthodontic treatment. The objective of this study was to assess whether an active reminder such as Dental Monitoring— integrated to the traditional orthodontic standard of care, could help subjects in maintaining a better oral hygiene during the first six months of treatment, and in reducing the number of appointments due to emergency reasons. Thirty subjects were included in this study to start an orthodontic treatment and were divided into two groups of fifteen. An



**Difference between study group and control group regarding Plaque Index (PI), Gingival Index (GI), and White Spot Lesions (WSL) at different time-points.**

oral hygiene kit which contains toothbrush and tooth paste, a mouthwash and a dental foss and an inter-proximal aid was given to each subject and were advised to brush their teeth twice a day and floss once per day. Plaque Index (PI), Gingival Index (GI), and White Spot Lesions (WSL) were clinically assessed every month for the first three months (t1, t2, t3) and at 6 months (t4). At chair-side visits, PI was scored by evaluating the presence of plaque on the mesial, buccal, distal and lingual surfaces, assigning a score from 0 to 3. By



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evaluating the presence of inflammation on the buccal surfaces GI was scored. Teeth were air-dried for 5 s and then the buccal surface close to the gingival contour to evaluate White Spot Lesions. During the observation period for both groups, the number of Emergency Appointment (EA) and Carious Lesions Onset (CLO) were recorded. Using plaquedisclosing tablet both groups were additionally monitored at each visit. At baseline the study subjects downloaded the DM app and were asked to upload pictures of their mouth. To each subject of the study group a scan box and a dedicated cheek retractor by DM was provided. DM evaluated oral hygiene status, checking the periodontal gingival health amount of plaque left on the teeth, and sent a text message to the subject. For PI, GI and WSL the intra-group differences at different time-points for study group patients were significant. PI values decreased from 0.51 at t<sub>0</sub>, to 0.31 at t<sub>4</sub>. GI values decreased from 0.88 at t<sub>0</sub>, to 0.36 at t<sub>4</sub>. WSL values decreased from 1.10 at t<sub>0</sub>, to 0.80 at t<sub>4</sub>. PI and GI values increased significantly in the control group.

|                                                                                                                                                                                                        | PI          |      |               |      |       |              | GI          |      |               |      |       |              | WSL          |      |               |      |       |          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------|---------------|------|-------|--------------|-------------|------|---------------|------|-------|--------------|--------------|------|---------------|------|-------|----------|
|                                                                                                                                                                                                        | Study group | SD   | Control group | SD   | Delta | p-value*     | Study group | SD   | Control group | SD   | Delta | p-value*     | Study group  | SD   | Control group | SD   | Delta | p-value* |
| t <sub>0</sub>                                                                                                                                                                                         | 0.51        | 0.45 | 0.44          | 0.47 | −0.07 | 0.383        | 0.88        | 0.52 | 0.43          | 0.43 | −0.45 | <b>0.013</b> | 1.10         | 1.50 | 1.13          | 2.06 | 0.29  | 0.464    |
| t <sub>1</sub>                                                                                                                                                                                         | 0.41        | 0.43 | 0.63          | 0.53 | 0.22  | 0.069        | 0.61        | 0.56 | 0.48          | 0.45 | −0.13 | 0.259        | 1.10         | 1.90 | 0.93          | 2.08 | −0.17 | 0.434    |
| t <sub>2</sub>                                                                                                                                                                                         | 0.42        | 0.42 | 0.69          | 0.54 | 0.27  | 0.050        | 0.45        | 0.45 | 0.58          | 0.48 | 0.13  | 0.281        | 0.73         | 1.02 | 1.00          | 1.90 | 0.27  | 0.372    |
| t <sub>3</sub>                                                                                                                                                                                         | 0.35        | 0.42 | 0.74          | 0.48 | 0.39  | <b>0.010</b> | 0.43        | 0.42 | 0.56          | 0.45 | 0.13  | 0.198        | 0.66         | 1.10 | 0.71          | 1.50 | 0.04  | 0.500    |
| t <sub>4</sub>                                                                                                                                                                                         | 0.31        | 0.43 | 0.56          | 0.43 | 0.25  | <b>0.039</b> | 0.36        | 0.42 | 0.47          | 0.35 | 0.11  | 0.189        | 0.80         | 1.40 | 0.93          | 1.70 | 0.13  | 0.458    |
| p-value <sup>†</sup>                                                                                                                                                                                   | <0.001      |      | <0.001        |      |       |              | <0.001      |      | <0.001        |      |       |              | <b>0.035</b> |      | 0.085         |      |       |          |
| Mean Values at time -points t0 (baseline), t1 (1 month), t2 (2 months), t3 (3 months), and t4 (6 months) of Plaque Index, Gingival Index, and White Spot Lesions for the study group and control group |             |      |               |      |       |              |             |      |               |      |       |              |              |      |               |      |       |          |

In conclusion, in reducing plaque and onset of carious lesions remote monitoring applied during orthodontic treatment showed encouraging results. Incidence of emergency appointments, gingival status, and onset of white spot lesions may not significantly improve. Especially in times when routine clinical check-ups might be compromised these preliminary results suggest potential application of this technology in clinical practice. To confirm the present findings further randomised studies including larger and more homogeneous groups of participants are advisable.

Reference: Sangalli L, Savoldi F, Dalessandri D, Bonetti S, Gu M, Signoroni A, Paganelli C. Effects of remote digital monitoring on oral hygiene of orthodontic patients: a prospective study. BMC Oral Health. 2021 Sep;21(1):1-8.



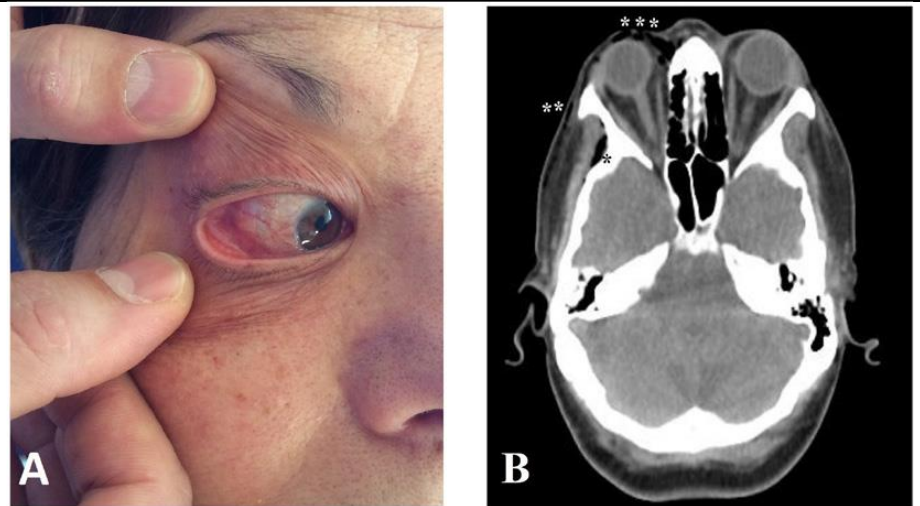
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## Cervicofacial Subcutaneous Emphysema following Dental Procedure

A 62-year-old female subject came with the complains of painless cervicofacial swelling which developed progressively over the past 4 hours. 7 days ago, subject had undergone extraction of

a first premolar during which bone damage of the mandibular jaw was noted. An hour before the swelling onset ,



(A) Photograph of the patient showing mild oedema of the palpebral conjunctiva and enhanced skin wrinkling. (B) Axial plane image of the CT scan conducted prior to admission showing air accumulation between tissues at the level of the right zygoma , subcutaneously on the right face and at the level of the orbit .

postextraction inspection of the alveolar ridge was performed, under local anaesthesia.

Dentist reported using an air syringe, in an attempt to dry the extraction socket and inspect a lesion on the alveolar ridge. The subject complained of mild dysphagia. Swelling was observed on the right half of the patient's face, including the maxillary and periorbital region and extended her right neck, down to the supraclavicular fossa. The first premolar extraction site was recognised during oral inspection.

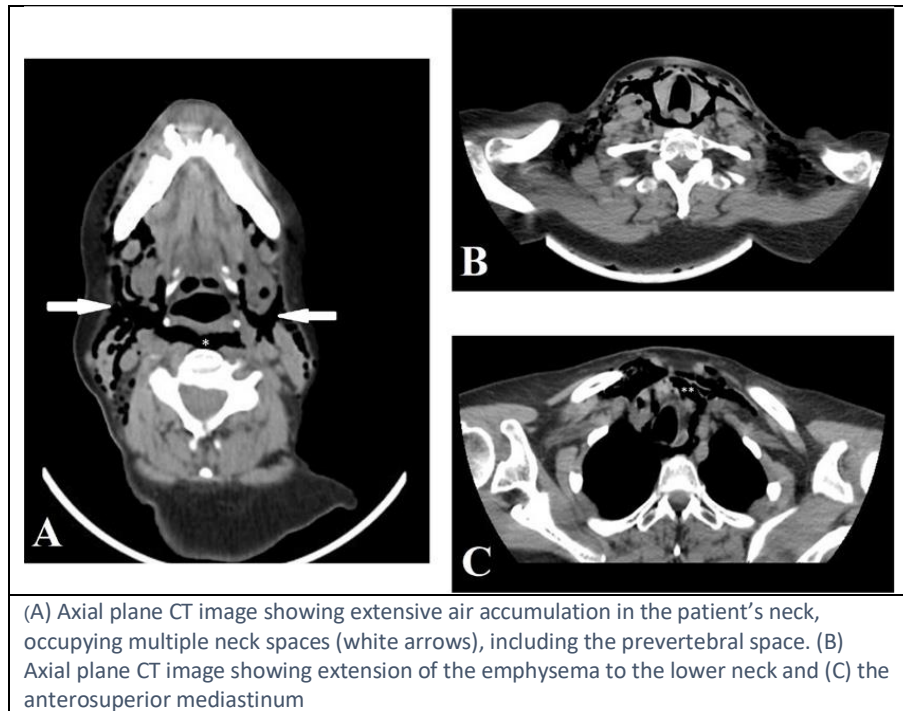


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Mild oedema of the floor of the mouth was observed. Rhinopharyngolaryngoscopy with flexible fiberscope revealed oedema or protrusion of the pharyngeal walls. Air trapped subcutaneously in the right face, from the orbital soft tissue spaces to the right neck, extending also to the prevertebral space. Emphysema was extended lower to the anterior mediastinum.

The subject was admitted and received intravenous amoxicillin with clavulanic acid and metronidazole. Two days later patient's stay was uneventful and was discharged, with oral



antibiotics. During the followup examination she was asymptomatic and the emphysema had clinically resolved completely. CT scan after 2 weeks revealed no noticeable emphysema.

In conclusion, abnormal presence of air in the soft tissues of the head and neck will be observed in Cervicofacial subcutaneous emphysema (CSE). It can be a rare complication of dental and oral surgical procedures. Use of high-pressure air instruments in dentistry, air syringes during root canal therapy has been demonstrated as the cause of cervicofacial emphysema. In this case study possible mechanism would also involve the



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previously mentioned alveolar bone lesion. Before any procedure requiring the use of such instruments the physician should be aware of this risk and should take suitable measures to minimise this complication.

Pathognomonic sign of Cervicofacial subcutaneous emphysema is Crepitus. Hence it should be recognised by every physician performing invasive or surgical procedures in the upper aerodigestive tract. When a patient develops a facial or neck swelling, CSE should always be considered because it can occur at any time after the procedure. It is self-limited condition and does not require any special treatment but life-threatening complications can occur. Neck spaces communicate through fascial planes with each other and with the mediastinum. Pneumomediastinum or pneumopericardium development can occur because of air accumulation.

Neck or mediastinal infections due to dissemination of oral micro-organisms. Air embolism has also been reported. Until the emphysema has resolved close monitoring is necessary in these cases.

**Reference:** Chrysovitsiotis G, Boutsikou A, Kollia P, Chrysovergis A. Cervicofacial subcutaneous emphysema following dental procedure. BMJ Case Reports CP. 2021 Sep 1;14(9):e243256.



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