
# SMART DENTAL UPDATES

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

This issue contains

- A Randomized Double Blind Study of the Efficacy of Steroid Supplementation After TMJ Arthrocentesis
- Effects of two post-processing methods onto surface dimension of in-office fabricated stereolithographic implant surgical guides
- Mandibular radiolucency with snow flake like calcifications

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Best Regards,
Medical Team, Micro Labs Limited

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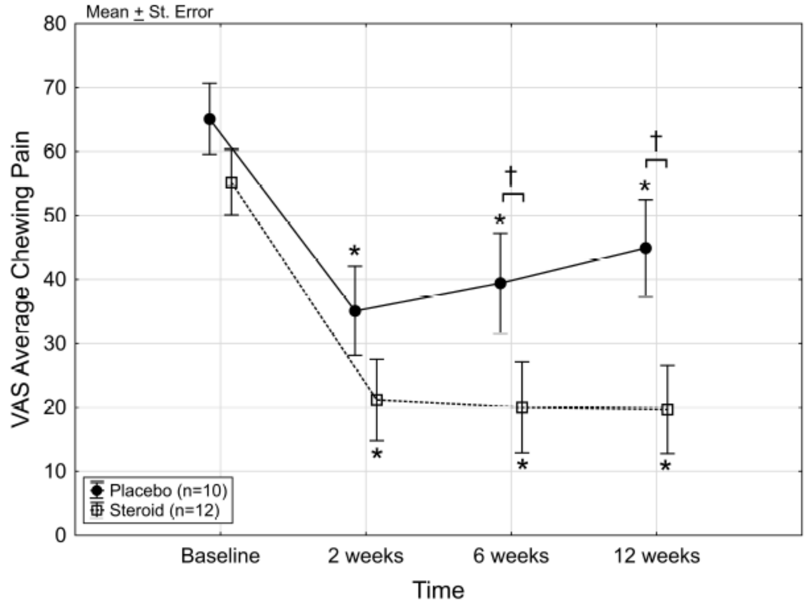
# A Randomized Double Blind Study of the Efficacy of Steroid Supplementation After TMJ Arthrocentesis

Management of intra-articular pain in the temporomandibular joint (TMJ) has been commonly achieved using non-steroidal anti-inflammatory medications, physical modalities such as cold or moist heat, occlusal appliance therapy and behavioral modification techniques. These reversible techniques can effectively manage myalgia and arthralgia conditions but there are a small proportion of patients that continue to have localized intracapsular TMJ pain. In unilateral intra-articular TMJ pain patients, the efficacy of steroid supplementation compared to placebo after TMJ arthrocentesis was examined in a randomized double blind placebo-controlled clinical trial.

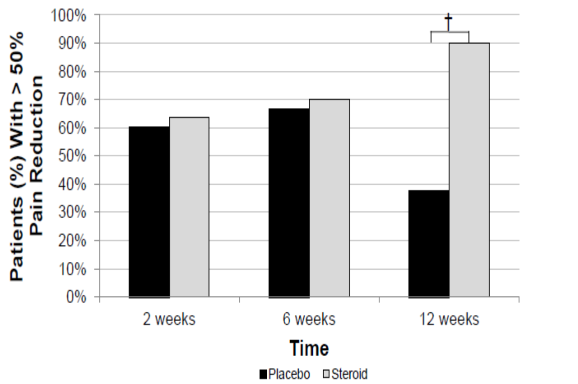
**The Steroid group had significantly less chewing pain at 6 and 12 weeks compared to the Placebo group.**

Female patients unsuccessfully treated by usual therapy were recruited. After obtaining informed consent, 24 patients were randomly assigned to an experimental group or placebo group. After local anesthesia, TMJ arthrocentesis was performed by a single investigator consisting of joint lavage using 100 mL of Ringers lactate. Depending on group assignment, triamcinolone acetonide (steroid) or Ringers lactate (placebo) was infused into the superior joint space. Patients blinded to the procedure were evaluated at baseline and 2, 6 and 12 weeks post-arthrocentesis using visual analog scale (VAS) primary outcome pain measures (pain intensity, pain unpleasantness, chewing pain). A clinical exam using Research Diagnostic Criteria for TMD was performed at each time point by a separate calibrated, blinded examiner. Data were analyzed using an intent to treat model.

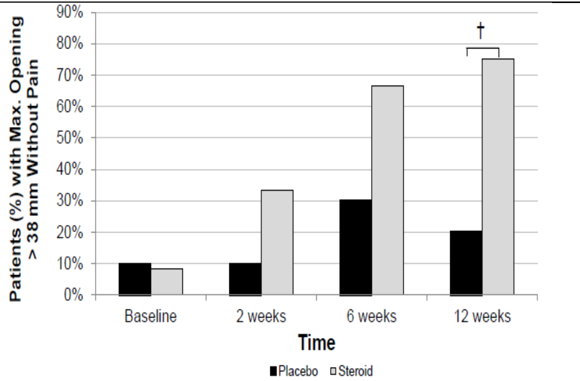



**Visual Analog Scale (VAS) ratings for the Steroid and Placebo groups for average chewing pain at baseline and 3 follow-up time points at 2, 6 and 12 weeks.**

The asterisks (*) represent statistically significant differences between mean ratings at the specific time point and baseline ($P < 0.01$, LSD test). The cross symbol (†) represents time points that have significant differences between groups ($P < 0.01$, LSD test).




Percentage of patients with a greater than 50% reduction in chewing pain at three post-arthrocentesis time points for Steroid and Placebo groups.




Percentage of patients with a maximum mandibular opening of > 38 mm without pain

Significant pain VAS decreases over time were found between baseline and post arthrocentesis time points for both groups. The Steroid group had significantly less chewing pain at 6 and 12 weeks compared to the Placebo group. Mean maximum mandibular openings without pain or with pain were significantly greater than baseline for all post-arthrocentesis time points in the Steroid group, while the Placebo group had a larger mandibular opening at 6 weeks. At 12 weeks, significantly more patients in the steroid group (75%) had a near normal mandibular opening without pain (38mm) compared to placebo (20%). Also, the proportion of subjects with greater than 50% chewing pain improvement in the Steroid group was significantly higher (90%) compared to the Placebo group (< 40%).

Source: Dolwick MF et al. J Oral Maxillofac Surg. 2020 Jul;78(7):1088-1099. doi: 10.1016/j.joms.2020.02.022.

## Effects of two post-processing methods onto surface dimension of in-office fabricated stereolithographic implant surgical guides

Long-term success of dental implant therapy is largely dependent on careful and thorough treatment planning. Computer-aided implant treatment planning ensures appropriate implant positioning based on optimal esthetic and functional requirements for particular implant restorations. Transferring this well-planned implant position into live patients can best be accomplished through implant guided surgery. Static implant guided surgery is currently the most accurate method to place an implant. Recently introduction of in-office stereolithographic printers allowed clinicians to produce implant surgical guides with lower cost, with the promise of higher accuracy than free-hand or conventional implant guide methods. Stereolithographic (SLA) printers are perhaps among the most popular in-office 3D printers. The study was done to evaluate the effects of two post-processing methods to the overall, intaglio, and cameo surface dimensions of in-office stereolithographic fabricated implant surgical guides.

**Post-processing of in-office implant surgical guides can have an influence on the guide dimensions**

Twenty identical implant surgical guides were fabricated using a stereolithographic printer. Ten guides were post-processed using an automated method. The other ten guides were post-processed using a series of hand washing in combination with ultrasonics. Each guide was then scanned using cone-beam computed tomography to produce a set of digital imaging and communications in medicine (DICOM) files which were converted into standard tessellation language (STL) files. The STL file was then superimposed onto the original STL design file using the best fit alignment. The average positive and negative surface discrepancy differences in terms of means and variances were analysed using t-test (α=0.05).

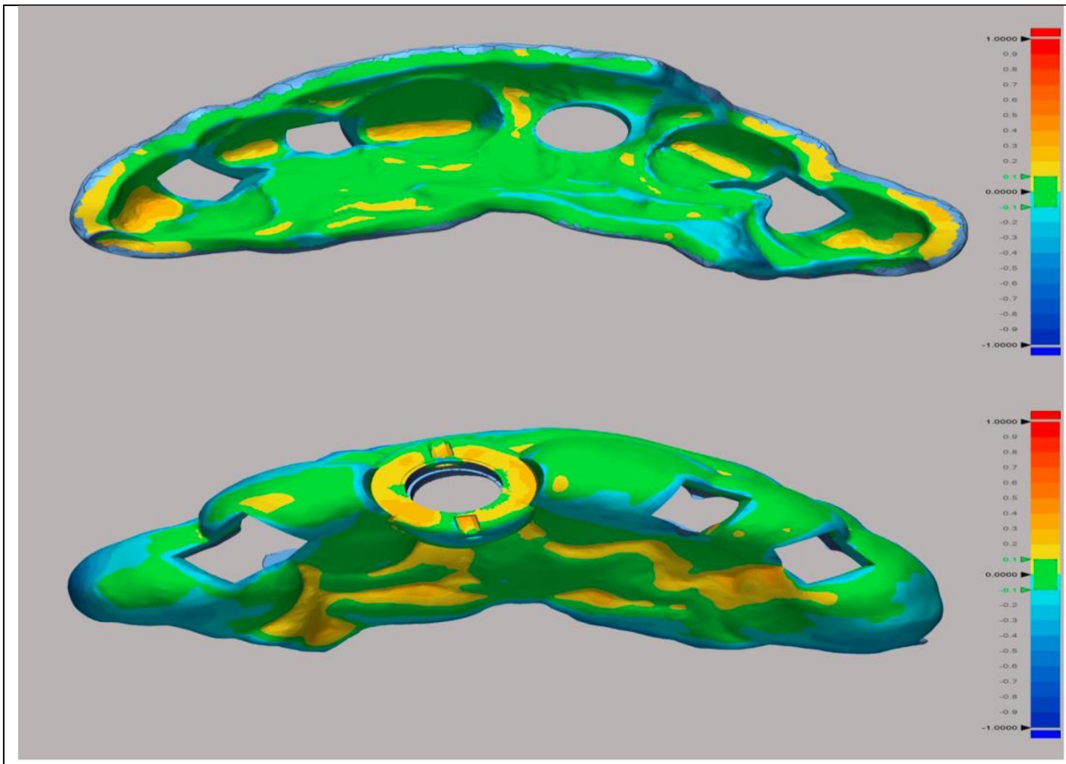
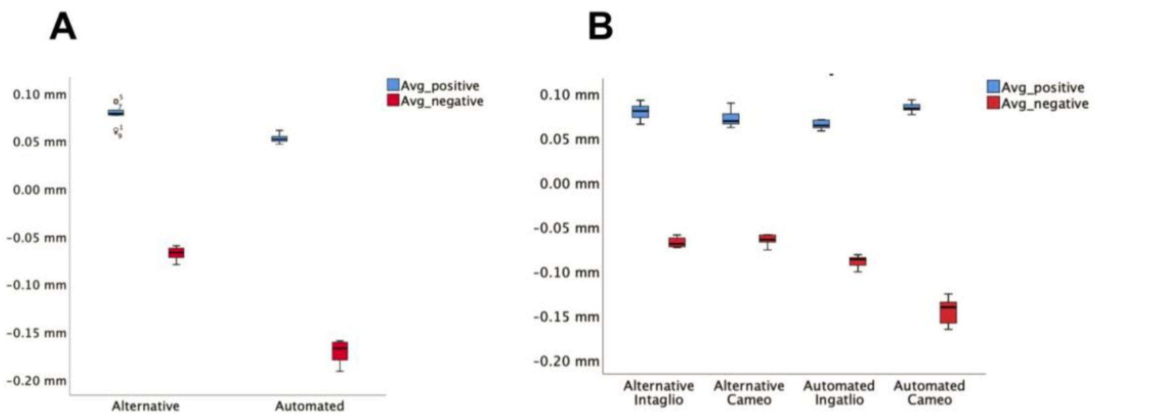


Figure 1 Superimposition of the printed guide STL file with the original STL file; (Top) Intaglio surface, and (Bottom) Cameo surface.




Box Plot Analysis : A) overall average positive (+) and average negative (-) discrepancies; B) Intaglio and cameo average positive (+) and average negative (-) discrepancies

For the alternative group, the average positive and negative overall, intaglio, and cameo surface discrepancies were 77.38 ±10.68 µm and -67.74 ±6.55 µm; 78.83 ±8.65 µm and -68.16 ±5.26 µm; and 70.5 ±8.48 µm -64.84 ±5.55 µm, respectively. For the automated group, the average positive and negative overall, intaglio, and cameo surface discrepancies were 51.88 ±4.38 µm and -170.7 ±11.49 µm; 64.3 ±4.44 µm and -89.45 ±6.25 µm; and 83.59 ±4.81 µm -144.26 ±13.19 µm, respectively. There was a statistical difference between the means of the two methods for the overall, intaglio, and cameo positive and negative discrepancies ($p < 0.001$). For a single implant tooth-supported implant guide, using hand washing with ultrasonics appeared to be consistently better than the automated method. The manual method presented with more positive discrepancies, while the automated method presented with more negative discrepancies.

Post-processing of in-office implant surgical guides can have an influence on the guide dimensions. The alternative technique using hand wash in combination with ultrasonics is prone to additional material on the surface, while the automated one is prone to loss surface material. In general, it seems that the alternative methods provide a similar or better printed guide's dimension. The difference is minimal and likely not clinical significant. Thorough rinsing of the printed guides with automated or hand wash/ultrasonics can be used as part of post-processing for implant guide fabrication with little effects on guide's dimension.

Source: Ammoun R et al. J Prosthodont . 2020 Jul 20. doi: 10.1111/jopr.13227. Online ahead of print.

## Mandibular radiolucency with snow flake like calcifications

A 21-year-old man had a 2-week history of intermittent dull pain in his right mandible. The patient was otherwise healthy with a noncontributory medical history. The clinical examination did not reveal any dental source of infection. There was no swelling or tenderness on palpation. A cone-beam computed tomographic (CBCT) scan showed a well-defined, expansile radiolucency with radiopaque foci in the right posterior mandibular body and angle region (Figures 1, 2, and 3). The approximate size of the radiolucency was 27 millimeters (height) X 15 mm (width) X 42 mm (length). An incisional biopsy specimen was obtained and submitted for histologic examination (Figure 4).

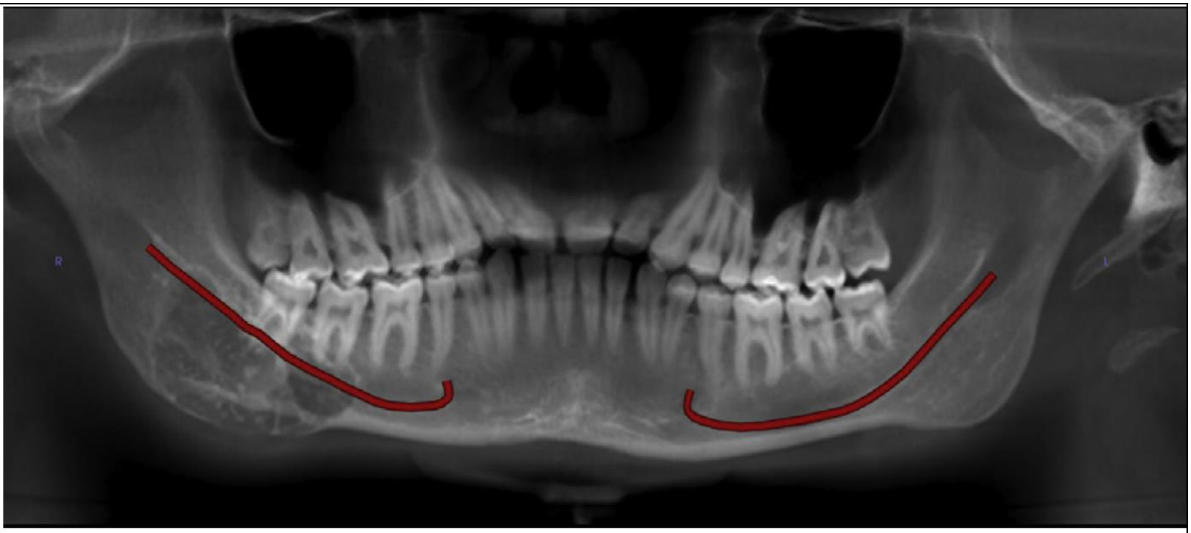


Figure 1. Reformatted panoramic cone-beam computed tomographic image shows a well-defined radiolucent lesion with internal calcifications in the right posterior mandibular body and angle region. The epicenter of the lesion is inferior to the mandibular canal (red). Note the superior displacement of the canal

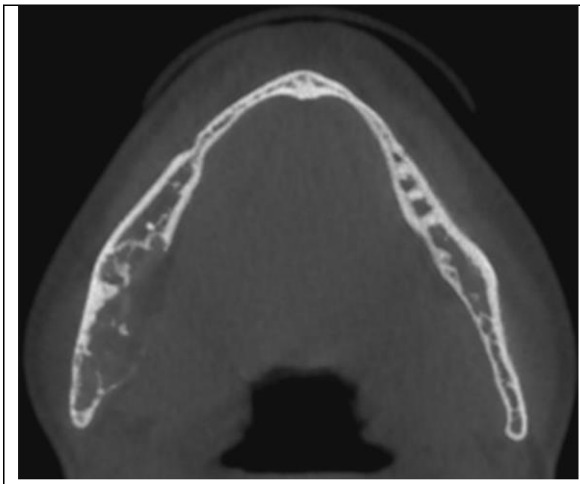


Figure 2. Axial cone-beam computed tomographic image shows expansion and thinning of the adjacent cortical plates. There is perforation of the lingual cortex without evidence of periosteal reaction

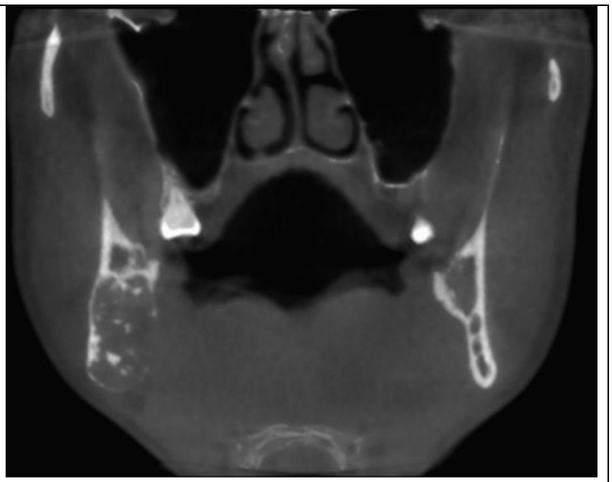


Figure 3. Coronal cone-beam computed tomographic image shows scattered flocculent or snowflake like calcifications in the internal structure of the lesion

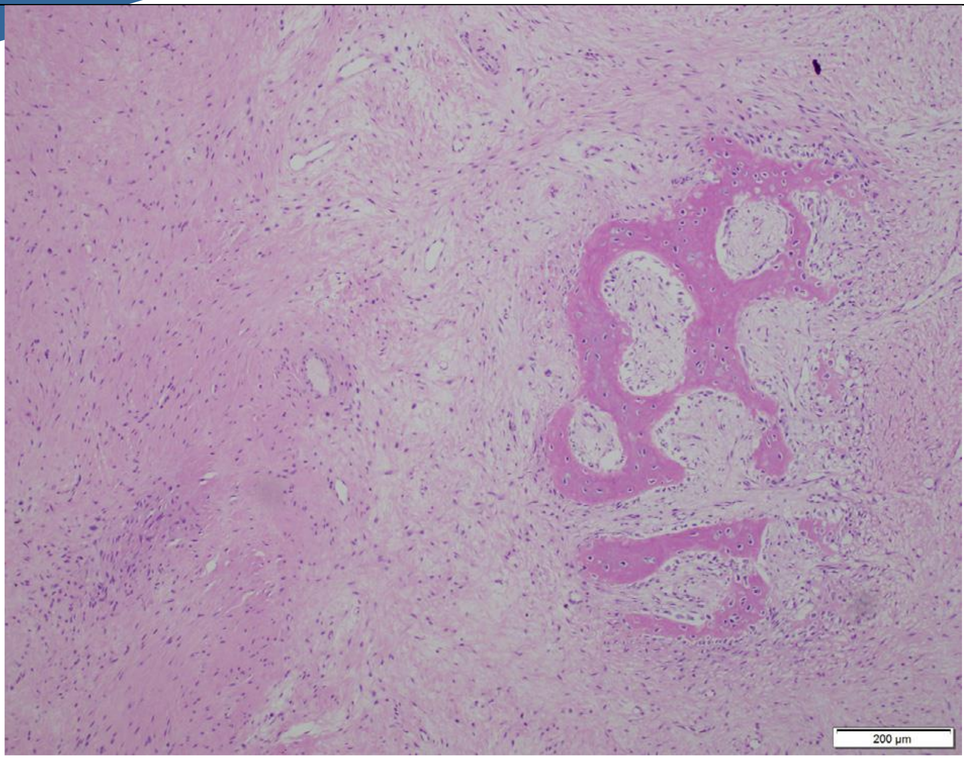



Figure 4. Photomicrograph shows irregular trabeculae of woven bone within a background of cellular fibrous connective tissue (hematoxylin-eosin stain, original magnification X100).

Ossifying fibroma is a benign neoplasm composed of fibrocellular tissue and mineralized material of varying appearances. In the fourth edition of the World Health Organization Classification of Head and Neck Tumors, ossifying fibromas were classified into 2 distinct types: cemento-ossifying fibroma and juvenile ossifying fibroma.1 Two histologic variants of juvenile ossifying fibromas are described: juvenile trabecular ossifying fibroma and juvenile psammomatoid ossifying fibroma. The cementoossifying fibroma appears to have an odontogenic origin and affects the tooth-bearing areas of the jaws, especially the mandible; however, the juvenile variants are nonodontogenic and classified under benign fibro-osseous lesions. Although both juvenile variants often share similar clinical features (such as aggressive growth pattern and propensity for recurrence), the psammomatoid type usually occurs in the sinonasal bones rather than the jaws, whereas the trabecular type is frequently reported in the nontooth-bearing areas of the jaws. Ossifying fibromas can occur at any age, but they are diagnosed most often in people younger than 30 years.

In the early stages, the lesion manifests as a unilocular expansile radiolucency. As the lesion matures, radiopaque tissue appears in the radiolucent structure. This creates an internal aspect that can vary; it may have a granular appearance similar to that of fibrous dysplasia, a wispy trabecular, or flocculent (implying snowflakelike features) pattern.

Ossifying fibromas are generally treated by enucleation and curettage. Segmental resection is preferred for lesions exhibiting rapid growth, although recurrence even after definitive surgery has been reported. There is no potential for malignant transformation. In this case, the patient underwent a segmental resection and fibula free flap reconstruction. The postoperative course and follow-up were uneventful.

The differential diagnosis of ossifying fibroma can include numerous conditions. However, when internal calcifications are evident, careful attention to the shape, size, pattern, and density of the calcified structure enables the clinician to formulate a well-thought-out differential diagnosis and make the imaging contribution to the case more pertinent. Although the imaging features are nonspecific in many times and a histologic diagnosis is necessary, cross-sectional imaging is invaluable in determining the anatomic extent of disease and involvement of surrounding structures.

Source: Omami G et al. J Am Dent Assoc. 2020 Jul 3;S0002-8177(20)30195-1. doi: 10.1016/j.adaj.2020.03.012.