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Modern Oral and Maxillofacial Surgery and its Expanding Scope of Care

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COLUMN ARTICLE

Oral and Maxillofacial Surgery (OMS) is a surgical specialty of Dentistry responsible for treating a wide variety of orofacial concerns (facial fractures, diseases, defects, etc.). The specialty originally began to expand due to trauma during times of war, but as of late it has found new growth through the use of emerging science, research and technology.

OMS now spans areas involving both the hard and soft tissues of the face, mouth and jaws. Surgical procedures of the craniomaxillofacial complex include: dentoalveolar surgery (impacted teeth, extractions on medically compromised patients, bone grafting and augmentation, placement of dental implants for tooth replacement, and maxillofacial implants for attaching craniofacial prostheses as well as bone anchored hearing aids), cosmetic surgeries (facelift, browlift, blepharoplasty, otoplasty, rhinoplasty, septoplasty, cheek augmentation or reduction, genioplasty, neck liposuction, lip enhancement, injectable cosmetic treatments, botulinum toxin, chemical peels), corrective jaw surgery also called orthognathic surgery (for open bite, protruding jaw or receding chin, congenital defects such as a cleft lip and palate, malocclusions resulting from under bites or severe overbites, difficulty swallowing, chewing, or biting food, unbalanced facial appearance from the front or side, inability to make the lips meet without straining, chronic mouth breathing and dry mouth, breathing problems associated with obstructive sleep apnea), corrections of congenital craniofacial defects and conditions (such as craniosynostosis), diagnosis and treatment of benign pathologies (cysts, tumors) and malignant oral and facial cancer (with ablative and reconstructive surgery), microsurgery (for neuro-vascular repair or anastomoses), treatment of temporomandibular joint (TMJ) disorders (basic splint therapy to complex reconstructions or replacements) and obstructive sleep apnea syndrome.

The benefits of CBCT imaging to the OMS over the years has been almost immeasurable and has fostered items like printed patient models and pre-bent titanium osseous fixation plates, to guide splints for implant surgery and bone reduction.

Dental implant placement for the OMS has quickly progressed from CBCT guided splints to modernly being placed using surgical, dynamic 3D navigation systems (such as the X-Guide system by X-NAV Technologies). With greater implant accuracy, the result is better esthetics for the replacement of missing teeth. The technology boasts improved accuracy of 8 degrees or more when compared to older methods.

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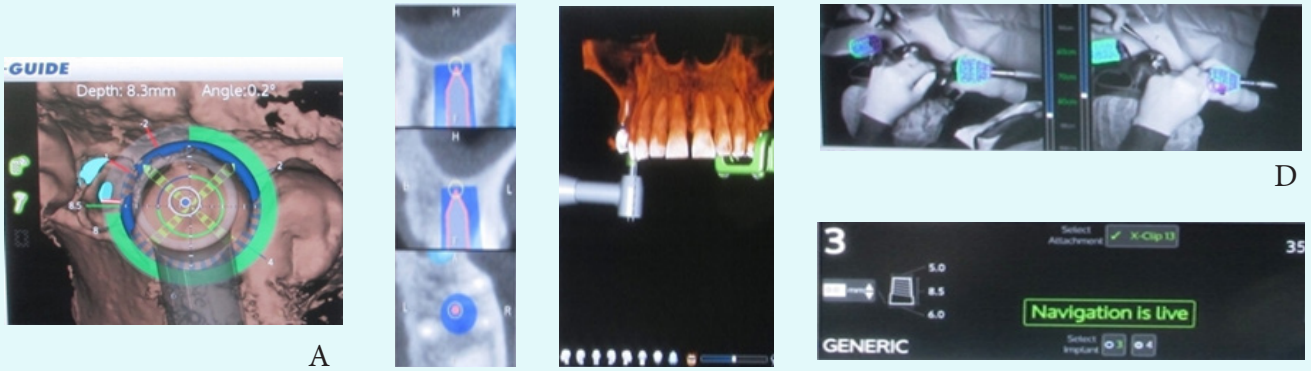
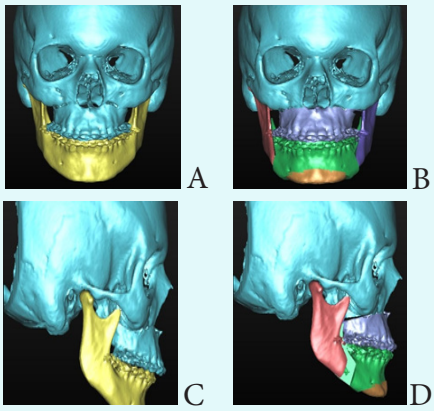


Figures 1: Dental implant placement using the newest CBCT guided technology, allowing pinpoint accuracy. A. Shows enlarged target window of software; B. Depicts windows of axial, coronal and saggital planes from patient's CBCT scan with overlay of preplanned implant position (in blue). Note the pinpoint accuracy allowing the placement of the drill at the floor of the maxillary sinus; C. Visualization of CG handpiece in realtime position and angulation in patient's mouth. Note the green clip that marries the patient tracker to the CBCT information; D. "Tracking" windows showing the realtime stereoscopic camera views that allow the software to blend the surgeon's motions on the patient to the CBCT information; E. Final window that shows tooth number being selected for the procedure and size of the implant planned, for overlay and placement.

Using today's advanced methods of dental and orthodontic treatment, allied with Virtual Surgical Planning (VSP) has allowed the correction of skeletal deformities and the orientation of facial osteotomies, with printed or mechanically lathed surgical guides. Thus they are successfully corrected with greater ease and OR time. Advanced software and 3D imaging in many cases can even allow an OMS to show prospective patient(s) a picture of what he/she will look like when their proposed treatment is completed.

The contemporary OMS' multifocal application of lasers has traversed from intraoral soft tissue procedures to facial cosmetic treatments. Patients can thus benefit from simultaneous photo-thermal ablation, coagulation and skin tightening, to adjunct hair removal on a lesser level. Different injectable procedures (neurotoxins, dermal fillers, and lipolysis agents) have only increased the armamentarium available to assist cosmetic patients.



Figures 2: VSP study of a patient with high oclusal plane, hypoplastic mandible and vertically hypertrophic chin. The goal of the treatment was to stablish a balanced Class I occlusion, repositioning of all structures to camouflaging patient´s dolicofacial aspect, and modifiyng it to a more brachyifacial one. A. Initial case in a frontal view; B. Segments after osteotomies divided by colors in a frontal view; C. Initial case in a lateral view; D. Orthognathic surgery performed by VSP and bone osteotomies showed in a lateral view.

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Figures 3: Cosmetic lip sculpting using the Lip-6tm technique and HA fillers, and botulinum neuromodulators for masseteric hypertrophy. A. Pre-procedure photo of patient with thin lips and notably wide jaw from masseter hypertrophy; B. Post treatment photo of same patient with sculpted, fuller and aesthetically proportionate lips. Note the decreased masseter size allowing for more feminine contours of the jawline.

Improving OMS methods and modalities have granted the most appropriate type of anesthesia for the procedure to be carried out with less morbidity. Most of the above extensive surgeries commonly occur in a hospital setting, but many can now be performed in an outpatient center or office basis under intravenous or sedation such as Bichectomy which is a simple and very safe surgical procedure indicated for patients with a rounded and wide face. The result is a thinner lower facial third. There are several benefits with buccal fat removal including be but not limited to: 1) thinner cheeks, 2) improvement of facial appearance, 3) cheeks more defined resulting in more prominent zygomatic bones, 4) gaining an increase in self-esteem, and 4) feeling more confidence.

OMS' frequently updating to the newest procedures and methods in their field has allowed them to expand the standards of care for patient(s). The comfort an OMS has in providing exceptional care to every patient by utilizing state-of-the-art equipment and techniques, permits for the specialty to surge forward and offer greater patient care and comfort with more predictable outcomes.

Figures 4: Female patient complaining of a puffy cheek since puberty. A. Picture shows patient in the first consultation desiring to have her buccal fat totally removed; B. Picture showing same patient four months post-operatively. It is important to mention she changed her hair style but did not lose body weight.