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# Oral Presentation Abstracts

제55차

대한악안면성형재건외과학회  
종합학술대회 및 정기총회

## 4-A-KS

## Clinical study for the prediction of mandibular position in Surgery-First Orthognathic Treatment

Min-Suk Kook, Jung-Hyon Chong,  
Jeong Joon Han, Seunggon Jung,  
Hong-Ju Park, Hee-Kyun Oh, Sun-Youl Ryu

*Department of Oral and Maxillofacial Surgery,  
School of Dentistry, Chonnam National University,  
Gwangju, Korea.*

**Purposes:** This study was performed to evaluate the accuracy of the prediction method of the mandibular position in surgery-first approach in patients with mandibular prognathism after bilateral sagittal split ramus osteotomy (BSSRO)

**Patients and methods:** This study consisted of 27 patients (male:female = 16:11; mean age, 25 years; age range, 21 to 33 years) who underwent BSSRO via surgery-first approach for mandibular setback surgery. After vertical dimension (VD) was measured on presurgical and surgical occlusion, mandibular autorotation was done during paper surgery. Predicted mandibular movement due to the autorotation was measured using the caliper. Actual amount of postoperative mandibular movement was evaluated with cephalometric analysis, and compared with predicted mandibular movement. To determine major contributing factors for postoperative mandibular movement, the amount of mandibular setback, duration of orthodontics treatment, and amount of VD increase were evaluated.

**Results:** Postoperative mandibular forward movement was greater than predicted mandibular movement in patients with greater amount of mandibular setback movement ( $> 10$  mm;  $P < 0.05$ ), longer duration of orthodontics treatment ( $> 18$  months,  $P < 0.05$ ), and greater amount of VD increase (1.5 mm;  $P < 0.05$ ).

**Conclusion:** These results suggested that the postoperative mandibular position after autorotation is more anterior than presurgically estimated position, and that amount of mandibular setback movement, orthodontic duration and cast-measured VD increase may affect the post-treatment mandibular position after orthodontic treatment.

## 4-A-1

## Reliability of Anterior nasal spine and A-point as Skeletal landmark to Evaluate of Stability of Le Fort I Surgery, Using 3D analysis

Seo-Yeon Jung, Jae-Seok Lim, Sung-Hwan Choi,  
Yong-Bin Lee, Young-Soo Jung, Hwy-Dong Jung

*Dept. of Oral & Maxillofacial Surgery,  
College of Dentistry, Yonsei University, Seoul, Korea*

The Maxillary skeletal landmark, such as Anterior nasal spine (ANS) and A-point, have been used for evaluate postoperative stability of LeFort I surgery. However, post-operative bone remodeling may change the configuration of the skeletal landmarks. Previous report with 2D analysis suggested that bone resorption of ANS had occurred after Le Fort I osteotomy.

Cephalometric analysis has been used to evaluate post-operative bone stability. 2D images have the distinct limitations, including image distortion and overlapping of the head structures, and they are influenced by the patient's head position. Otherwise, 3D-CT analysis can offer more precise information than conventional cephalograms.

Using three dimensional(3D) analysis, the pattern of bony resorption and remodeling of these points, have not been sufficiently studied yet.

The purpose of this study was to identify reliability of anterior nasal spine(ANS) and A-point as Skeletal landmark to Evaluate of Stability of LeFort I surgery using three dimensional(3D) analysis

4-A-2

## Hard and Soft Tissue Changes in Transverse Mandibular Width after Mandibular Setback Surgery Using Intraoral Vertical Ramus Osteotomy: 3D Analysis

Sung Hwa Lee, DDS, Hye-In Jeong, DDS,  
Sang Hyun Song, DDS, Yong Bin Lee, DDS,  
Hwi-Dong Jung, DDS, PhD,  
Young-Soo Jung, DDS, PhD

*Department of Oral and Maxillofacial Surgery,  
College of Dentistry, Yonsei University, Seoul, Korea*

The major operation techniques for correction of mandibular prognathism include the intraoral vertical ramus osteotomy (IVRO) and sagittal split ramus osteotomy (SSRO). Many surgeons often use the IVRO technique because it has several advantages over complications such as temporomandibular joint disorder, inferior alveolar nerve damage.

Mandibular setback using IVRO technique raises a concern for unfavorable esthetic results, especially with the transverse mandibular width (TMW) being widened for the proximal segment is positioned laterally to the distal segment. The study of changes in TMW after IVRO have been reported rarely and no study has been reported yet using 3D analysis.

Thus, the purpose of this study was to investigate changes in TMW after mandibular setback using IVRO technique (total 80 patients) via 3D analysis with 3D CBCT taken preoperatively, 1 month, and 1 year postoperatively. Analysis was done using the intersection line of perpendicular plane of FH plane and mandibular plane 1, 2, 3, and comparing the width of hard and soft tissue changes on the intersection line.

4-A-3

## Late Recovery of Condylar Sag after Vertical Ramus Osteotomy

Eunhee LEE\*, Cheol-Hee JEONG, Myeong-Gyun KIM,  
Jae-Young KIM, Kwang-Ho PARK

*Department of Oral and Maxillofacial Surgery,  
Gangnam Severance Hospital,  
Yonsei University College of Dentistry, Seoul, Korea*

**Introduction:** All kinds of mandibular osteotomy induce condylar position changes. Vertical ramus osteotomy (VRO) is reported higher incidence of condylar sag. In this study, we analyzed patients who had late condylar sag after VRO after 1 year of VRO and discussed the causes and remodeling of condyle head of those patients.

**Method and materials:** The study population is comprised of 412 who were diagnosed with maxillofacial deformity and then underwent orthognathic surgery at Gangnam Severance Hospital. Postoperatively, the condylar position and sag was evaluated from panorama and tomograms of the temporomandibular joint (TMJ) at immediately after VRO, 1 month after VRO and 1 year after VRO.

**Result:** The condylar sag was observed in 10 joints in 9 patients (7 females, 2 males) at 1 year after VRO. Proper bone contact between proximal and distal segments was observed in 3 joints and interfered bone contact between proximal and distal segments was observed in 4 joints in immediately postoperative. Non- or insufficient bone contact between proximal and distal segments was observed in 3 joints in immediately postoperative. Condylar head apposition (postero-superior side) was observed in 8 joints of 9 patients.

**Conclusion:** Proper bone contact between the proximal and distal segment is essential to prevent the delayed recovery of condylar sag and restore the normal movement of the mandible. And it should implement appropriate medication and physical therapy in order to recover functional movement, reduce muscle tone and masticatory muscle pain before and after surgery.

## 4-A-4

## The Evaluation of Sino-Nasal Changes after Le Fort I Osteotomy using CBCT Images

Dong Hyun Cho\*, Doo Yeon Hwang,  
Seung Woo Baeg, Yun Pyo Hong, Seung Il Song\*,  
Jeong Keun Lee

*Department of Dentistry, Oral and Maxillofacial surgery,  
AJOU University School of Medicine*

Changes of maxilla position after Le Fort I osteotomy affect to surrounding soft tissues including nasal septum and worsening of nasal septal deviation may affect to breathing or snoring. Mucosal thickening is commonly seen and it may cause a rare complication such as maxillary sinusitis.

The aim of this study is to investigate the changes of sino-nasal changes after Le Fort I osteotomy for predicting amount of changes in sino-nasal area after surgery and planning of the management before surgery.

Patients who had taken preoperative and postoperative CBCT after Le fort I osteotomy under general anesthesia in department of Oral and Maxillofacial Surgery, AJOU University Dental Hospital between from 2012 to now are included in the study. Changes of sino-nasal changes after Le Fort I osteotomy were evaluated using CBCT images.

## 4-A-5

## Craniofacial Growth and Structural Changes after Botulinum Toxin Injection into the Masticatory Muscles of Juvenile Monkeys

Kim Hak-Jin<sup>1,2</sup>, Choi Ji Wook<sup>1</sup>, Tak Hye-Jin<sup>3</sup>,  
Moon Joo-Won<sup>3</sup>, Park Kyeong-Mee<sup>4</sup>,  
He Jinqun<sup>5</sup>, Piao Zhengguo<sup>5</sup>, Lee Sang-Hwy<sup>1</sup>

<sup>1</sup>*Dept. of Oral and Maxillofacial Surgery,  
Yonsei University, College of Dentistry, Seoul, Korea*

<sup>2</sup>*Dept. of Oral and Maxillofacial Surgery,  
Yongin Severance Hospital, Yonsei University, Yongin, Korea*

<sup>3</sup>*Oral Science Research Center, Yonsei University,  
College of Dentistry, Seoul, Korea*

<sup>4</sup>*Dept. of Advanced General Dentistry, Yonsei University,  
College of Dentistry, Seoul, Korea*

<sup>5</sup>*Dept. of Oral and Maxillofacial Surgery,  
Stomatology Hospital of Guangzhou Medical University,  
Guangzhou, China*

**Aims:** The purpose of this study was to investigate the relationship between masticatory hypofunction and craniofacial bone growth and internal structural change in juvenile monkeys.

**Methods:** Ten male cynomolgus monkeys aged 18 to 24 months were divided into three groups: control group (n=3), unilateral group (n=4), and bilateral group (n=3). Masseter, temporalis, and medial pterygoid muscles were used for botulinum toxin injection and the craniofacial growth was observed for 6 months. The external skeletal changes and internal bony changes were analyzed by using 3D CT and micro-CT.

**Results:** After botulinum toxin injection into masticatory muscles of juvenile monkeys, we observed:

1. Decreased growth in the mandible on the reduced masticatory muscle function side. Vertical height of the ramus, anterior-posterior length of the ramus, and width of mandible were decreased.
2. A decreased length as well as directional change in the growth of the condylar unit and the mandibular ramus.
3. In the maxilla and cranium, reduced growth of the experimental side was observed in the maxillary arch, zygomatic arch, and the cranium.
4. In the maxillo-mandibular complex, reduced down-

ward growth in the experimental side was observed.

5. In the micro-CT analysis, the trabecular pattern in the condyle area was changed from the regular dense vertical pattern in the control group to a loose irregular pattern in the experimental side.

**Conclusions:** In conclusion, masticatory muscle hypofunction induced by botulinum toxin injection in juvenile monkeys caused decreased skeletal growth or directional change of mandible, maxilla, and cranium; particularly, the effect on vertical growth was strong and the corresponding internal structural changes occurred at the same time.

4-A-6

## The accuracy of computer simulation for orthognathic surgery

Hui Young Kim, Byoung Moo Seo

*Department of Oral and Maxillofacial Surgery,  
Seoul National University Dental Hospital*

**Introduction:** Traditionally, the treatment plan of orthognathic surgery has errors due to its diagnosis and plan are based on 2 dimensional plane. Computer simulation surgery is based on 3 dimensional diagnosis and plan. Therefore, it provides more precise prediction for the surgical results and brings up satisfactorily accurate end results than conventional planning in orthognathic surgery. In this report, we evaluate the accuracy of the computerized simulation for the orthognathic surgery (BOS system).

**Patients and Methods:** Total 33 patients were enrolled in this study, who underwent Le Fort I osteotomy and bilateral sagittal split ramus osteotomy. Using pre- and postoperative CT data, the x-,y-,z- coordinate of each landmarks were analyzed to evaluate the surgical accuracy of BOS system. A 2-tailed paired Student t test was performed using SPSS for statistical analysis between planned and actual surgical change.

**Results:** The deviation of surgical results from the planned position measured in Cartesian coordinate in 3 axis were mean absolute deviation 0.54~0.76 mm (RMSD 0.68~0.94) in maxilla, 0.90~1.66 mm (RMSD 1.13~2.06) in mandible, 0.07~0.84 mm (RMSD 0.69~1.19) in condyle. There are no significant differences between planned and actual results in most of landmarks in maxilla and mandible.

**Conclusion:** The computer based simulation and guiding system (BOS system) is proved to be accurate. This more accurate and predictable surgical planning method based on BOS system will provide consistent reliable prediction in the field of orthognathic surgery.

## 4-B-KS

## Recent trend and surgical management for panfacial fracture

Jin-Wook Kim, DDS, Ph.D

*Department of oral and maxillofacial surgery,  
school of dentistry, Kyungpook National University*

Panfacial fracture is extremely difficult to manage facial injuries but concomitant injuries and severe complications including facial esthetic and functional problems can make it harder. Thorough evaluation and closed co-work with other specialists is needed when reduction and fixation cannot be achieved quickly. Emergency bony support and soft tissue key suture provide the patients with airway integrity, hard and soft tissue vitality. A systemic treatment plan must be made by 3D CT image. This plan include airway management for surgery, sequence of reduction and fixation, approach method, soft tissue resuspension and reconstruction of lost tissue like inferior orbital wall, zygomatic buttress and soft tissue. From known to unknown structures, accurate reduction and fixation will provide proper occlusion, facial projection, width, height and function. Consideration about facial retaining ligaments must be given to prevent soft tissue sagging.

## 4-B-1

## A comparison of postoperative complications according to treatment of third molars in mandibular angle fracture

Hye-Youn Lim\*, Sang-Jun Park, Tae-Young Jung

*Department of Oral and Maxillofacial surgery,  
Pusan Paik Hospital, Inje University College of Medicine*

**Purpose:** The aims of this study were to compare the postoperative complications according to treatment of third molars in mandibular angle fracture line with open reduction with internal fixation(ORIF).

**Material and methods:** Data were collected on patients who presented with mandibular angle fracture at the Oral and maxillofacial Department of Pusan Paik hospital Between January 2011 and December 2015. 48 patients were identified as having third molars in fracture line and following up until plate removal. The complications as postoperative infection, postoperative nerve injury, bone healing, changes of occlusion and temporomandibular joint(TMJ) were compared and analyzed using standard statistical methods.

**Results:** 48 patients identified as having third molars in fracture line undergone ORIF surgery and intraoperative MMF with arch bar. The third molar in the fracture line were retained in 39 patients during ORIF. Some of them complained of nerve injury, TMD (Temporomandibular disorder), change of occlusion and postoperative infection around the retained third molars. Otherwise, the third molar were removed in ORIF surgery in 9 patients. Some of them complained of nerve injury but there is no other complications as TMD, change of occlusion, postoperative infection. In two group, there is no delayed union or nonunion.

**Conclusions:** No statistically significant difference was found between non-extraction group and retained teeth in complications after ORIF. However, when the third molar in fracture line was likely to remove at the surgery of plate removal, the third molar impacted partially or completely were nonfunctional and they may develop pathologic conditions like pericoronitis, extraction of the third molar in fracture line could be considered at ORIF surgery of mandible angle fracture.

## 4-B-2

## Study on the outcome of Nam's reduction on mandibular condyle fracture

Tae-Whan Seong\*, Ji-eun Yoon, Jung-won Cho, Jun-bum Lee, Hun-young Kim, Jung-hyun Park, Jin-woo Kim, Sun-Jong Kim

*Dept. of Oral and Maxillofacial Surgery, Ewha Womans University Mokdong Hospital*

**Introduction:** This study is about long-term prognosis of patients who treated with Nams' reduction(extracoporeal reduction and internal fixation).

**Material and Method:** Patients who underwent Nams' reduction(extracoporeal reduction and internal fixation) for mandibular condyle fracture at Mok-dong hospital, Ewha Womans University between 2001 to 2016 were selected for study. Induced occlusion was performed 0-6 weeks after surgery using a rubber band. Operation time, Panorama and Cone beam Computed tomography(CBCT), Maximum mouth opening, Lateral movement of jaw, Occlusal stability, Mandibular condyle resorption, Temporomandibular joint pain were surveyed.

**Results:** In some patients showed mandibular condyle resorption, but in most patients showed occlusal stability and were observed mandibular condyle remodeling under panorama and cone beam computed tomography (CBCT). In patients who underwent mandibular condyle resorption showed occlusal instability and mandible deviation to mandibular condyle resorption side. The patients who complained of some facial nerve showed a pattern of recovery.

**Discussion and Conclusion:** Nam's reduction(extracoporeal reduction and internal fixation) is approached through submandibular area, despite of the mandibular condyle resorption, is can be considered surgery technique in cases of mandibular condyle fracture which hard to reduction and fixation of fracture segments and anterior-medially deviated fragments are existed.

## 4-B-3

## Protrusive Maxillomandibular Fixation for Intracapsular Condyle Fracture

Yeong Kon Jeong\*<sup>1</sup>, Eun Joo Choi<sup>1,2</sup>, Moon Gi Choi<sup>1,2</sup>, Won Jong Park<sup>1,2</sup>, Kyung-Hwan Kwon<sup>1,2</sup>

<sup>1</sup>*Department of Oral & Maxillofacial Surgery, College of Dentistry, Wonkwang University*  
<sup>2</sup>*Wonkwang Dental Research Institute*

Clinical problems of conventional closed reduction method for mandibular intracapsular condyle fracture involve a decreased maximum mouth opening, reduced ROM(range of motion) of mandible, and reduced occlusal stability. Action of lateral pterygoid muscle causes displacement of medial condyle fragment to anterior, medial and inferior direction, and it can induce overgrowth of bone between the medial and lateral condyle fragment result from mechanism like distraction osteogenesis, causing structural deformity on the condyle. In addition, when conventional closed reduction method through maximum intercuspal position is performed, continued interdental contact causes hyperactivity of masticatory muscle, leading to a decreased vertical dimension and premature contact of the posterior teeth.

To improve the clinical problems of conventional closed reduction method, we devised a method for closed reduction through protrusive maxillomandibular fixation, duration for 2 weeks.

In this study, 2 patients confirmed with mandibular intracapsular condyle fracture were included. Both patients regained acceptable occlusion without any instability and recovered ROM(range of motion) of mandible after closed reduction through protrusive maxillomandibular fixation by the 6-month follow-up.

## 4-B-4

## Synovial chondromatosis on Left Temporomandibular joint(TMJ) : A Case Report

Han-Eol Lee\*, Yong-Chan Ha, Won-Gyo Seo, Moon-Young Kim, Se-Jin Han, Chul-Hwan Kim, Jae-Hoon Lee

*Dept. of Oral and maxillofacial surgery, College of Dentistry, Dankook University*

Synovial Chondromatosis (SC) of temporomandibular joint (TMJ) is a rare benign, tumour-like disorder, characterised by chondro-metaplasia of the synovial membrane with cartilaginous nodules. SC rarely affects the TMJ. It mostly occurs between the fourth and fifth decades of life. Although a male preponderance exists in the extremities, in the TMJ a female preponderance is seen (female:male, 7:3). SC occurs more on the right side (right:left, 1.25:1).

It has no known aetiology. The most common disorder that affects the TMJ is internal derangement, which is largely treated by nonsurgical means. On occasions, intra-articular disease may appear in the TMJ that can only be treated by surgical means.

We present a 28 year old male patient with SC of the left TMJ. Investigations include Computerised Tomography (CT) and Magnetic Resonance Imaging (MRI), but definitive diagnosis is made via histological examination. On surgical exploration, approximately fifty calcified deposits were evacuated from disc spaces, as supported by a clinical photographs.

## 4-B-5

## Maximum standardized uptake value of F-18 sodium fluoride PET/CT for the evaluation of temporomandibular joint disorder

Hyun-Suk Kim\*<sup>1</sup>, Minseok Suh<sup>2</sup>, Won Woo Lee<sup>2</sup>, Young-Kyun Kim<sup>1,3</sup>, Pil-Young Yun<sup>1</sup>

*<sup>1</sup>Dept. of Oral and Maxillofacial Surgery, Section of Dentistry, Seoul National University Bundang Hospital*

*<sup>2</sup>Dept. of Nuclear Medicine, Seoul National University Bundang Hospital, Seoul National University College of Medicine*

*<sup>3</sup>Dept. of Dentistry & Dental Research Institute, School of Dentistry, Seoul National University*

**Introduction:** The aim of this study was to investigate the usefulness of quantitative parameter [standardized uptake value (SUV)] of F-18 sodium fluoride (F-18 NaF) PET/CT for the evaluation of temporomandibular joint disorder (TMD).

**Method and materials:** One hundred fifty-four temporomandibular joints (TMJs) of 77 TMD patients (14 males, 63 females; mean  $40.0 \pm 17.0$  yrs.) were evaluated in this study. F-18 NaF PET/CT parameters (SUVmean and SUVmax) were compared for the presence of TMJ arthralgia (pain on movement and/or TMJ tenderness) (arthralgic=85, and non-arthralgic=69), and clinical subtypes, diagnosed based on Research Diagnostic Criteria for TMD (TMD subtype 4=50, and non-TMD subtype 4=104). Additionally, the TMD4 patients (n=50) were sub-grouped according to the presence of TMJ arthralgia (arthralgic TMD4=35, and non-arthralgic TMD4=15).

**Results:** SUVmax ( $6.70 \pm 3.58$  vs.  $4.16 \pm 1.35$ ,  $p < 0.001$ ) and SUVmean ( $1.73 \pm 0.42$  vs.  $1.50 \pm 0.28$ ,  $p = 0.007$ ) were significantly greater in arthralgic TMJs than non-arthralgic TMJs. In receiver-operating characteristic (ROC) curve analyses for arthralgic TMJ, SUVmax had the greater area-under-the-curve (AUC=0.765) than SUVmean (AUC=0.659) ( $p = 0.006$ ). SUVmax cutoff 4.46 for detection of arthralgic TMJ, yielded the sensitivity of 75.29% and the specificity of 69.57%. SUVmax was significantly greater in TMD4 than non-TMD4 subtypes ( $6.58 \pm 3.91$  vs.  $5.07 \pm 2.45$ ,  $p = 0.049$ ) but SUVmean was not significantly different between TMD4 and non-TMD4



4-B-6

## Oral AntiCoagulat and Oral Minor Surgery

SeungWoo Baeg\*, YunPyo Hong, DongHyun Cho,  
SeungIl Song, JeongKeun Lee

*Oral Minor Surgery and Oral AntiCoagulant*

subtypes ( $1.65 \pm 0.46$  vs.  $1.61 \pm 0.34$ ,  $p=0.840$ ). In the subgroup analysis of TMD4 with or without arthralgia, SUVmax ( $7.66 \pm 4.11$  vs.  $4.05 \pm 1.68$ ,  $p < 0.001$ ) and SUVmean ( $1.75 \pm 0.47$  vs.  $1.39 \pm 0.31$ ,  $p=0.009$ ) were significantly greater in arthralgic TMD4 than non-arthralgic TMD4. In ROC curve analyses for arthralgic TMD4, SUVmax showed greater diagnostic performance (AUC=0.803) than SUVmean (AUC=0.776,  $p=0.585$ ) without a statistical significance.

**Conclusions:** SUVmax derived from F-18 NaF PET/CT showed greater diagnostic capability than SUVmean for identification of TMJ arthralgia, TMD subtype 4 and arthralgic TMD subtype 4. F-18 NaF PET/CT may be useful for evaluation of TMD.

Oral antithrombotic agents are under a lot of people are taking a variety of reasons. As aging society is a variety of chronic medical conditions, while its incidence is increasing.

Oral antithrombotic agents may help prevent high blood pressure and preventing thrombosis, but patients who take these medicines have the risk of bleeding during surgical operation

Cardiovascular system may have benefits by preventing blood clots when taking oral antithrombotic agents, but there may be disadvantages such as bleeding during surgery. In contrast, the risk of bleeding when the interruption oral antithrombotic is reduced for the surgeon, cardiovascular system may has a double face the problem of burdensome.

This study was conducted to have a minor oral surgery were evaluated in the bleeding tendency or may not be discontinued the drug. Experimental group was discontinuation patients and control group was not. Significant difference as between the test and control groups are statistically was not observed. As a result under appropriate bleeding control, oral minor surgery can be performed safely without interruption of the oral antithrombotic.

**4-C-KS****Current issues in surgical treatment of oral squamous cell carcinoma**

Jun-Young Paeng

*Dept. of Oral & Maxillofacial Surgery,  
School of Dentistry, Kyungpook National University*

Even with the development of other treatment modalities such as chemotherapy including targeted therapy and radiation therapy, the surgical treatment is still the primary and basic treatment for the oral squamous cell carcinoma(OSCC). The early stage of OSCC and advanced one are so much different not only in their prognosis but also in the choice of treatment modalities, complications, and quality of life(QOL).

Surgical management of primary site and neck node has not been changed much for a long time. Radical approach is always beneficial to the locoregional control of the primary site but, the functional rehabilitation of oral and maxillofacial area is considered to be also important to the patient. More precise and targeted control of ablation surgery is investigated and tried. More super-selective approach was tried in neck management. Saving the NIIb nodes was recommended according to the primary site. And sentinel node biopsy is still under the research in its effectiveness.

In this presentation, the current evidences for the trend of surgical treatment of OSCC will be reviewed with cases and literature review.

**4-C-1****Case Report: Undifferentiated Pleomorphic Sarcoma in Mandible**Chul-Hong Koo\*, Chan-Woong Moon,  
Tae-Hwan Kim, Moon-Young Kim, Se-Jin Han,  
Chul-Hwan Kim, Jae-Hoon Lee*Dept. of Oral and maxillofacial surgery,  
College of Dentistry, Dankook University*

Undifferentiated pleomorphic sarcoma(UPS) is a soft tissue sarcoma with prevalence of approximately 5% of all in adults and extremely rare prevalence in maxillofacial region. In the past, malignant fibrous histiocytoma(MFH) was the term used to describe this pathology, but in 2002 the World Health Organization reappraised and modified the terminology. It is characterized by marked nuclear pleomorphism and spindle cell morphology. We report a case of UPS located in the mandible. Painful growing mass in mandible of 2 months duration was presented by a 57-year-old patient. Computed Tomography and PET-CT revealed heterogeneous enhancing, lobulating hypermetabolic mass in left mandible. The size of lesion was measured about 6 x 5 x 4 cm. Radical surgery involving mandibulectomy with facial resection followed reconstruction with fibular free flap and radial forearm free flap was performed. According to immunohistochemical study, the tumor was diagnosed as UPS finally.

4-C-2

## Metastatic renal cell carcinoma to the head and neck: A case report

Heon-Young Kim\*, TW sung, JB Lee, JE Yoon, JW Cho, JH park, JW Kim, SJ Kim

*Department of Oral and Maxillofacial surgery, Ewha Womans University Mok-dong Hospital, Seoul, Korea*

Renal cell carcinoma(RCC) is the third most frequent neoplasm to metastasize to the head and neck following breast and lung carcinoma. Despite being reported infrequently, head and neck region metastases may be linked to RCC in up 8~15% of cases. Unfortunately, oral cavity metastasis from RCC is usually a manifestation of wide-spread disease.

Malignant tumor has been shown to metastasize to the head and neck region in rare instances. Therefore, the work-up of a new oral or neck lesion in light of a history of tumor should include metastatic tumor as part of the differential diagnosis.

Still, most patients die within 1 year after detection of head and neck metastasis; therefore, therapeutic decisions should maximize comfort and minimize morbidity considering the poor long-term prognosis at this stage of the disease.

Treatment of metastatic tumor to the head and neck is directed mainly toward palliation. Excision has been performed primarily to control pain and prevent bleeding and infection.

The following is a case study of a patient who was treated with a left-side radical nephrectomy with oral cavity metastasis of renal cell carcinoma.

4-C-3

## Spindle Cell Carcinoma of Tongue : A Case Report

Woo-Jin Shin\*, Jae-Woo Park, Heung-Chul Park, Moon-Young Kim, Se-Jin Han, Chul-Hwan Kim, Jae-Hoon Lee

*Dept. of Oral and Maxillofacial surgery, College of Dentistry, Dankook University*

Spindle cell carcinoma(SpCC) is referred to as a variant type of oral squamous cell carcinoma. And it is also called as "sarcomatoid squamous cell carcinoma" because it consists of normal squamous carcinoma cells with spindle-shaped cells that look like sarcoma. SpCC is unusual and aggressive variant of squamous cell carcinoma, which frequently recurs and metastasizes; for this reason, the right diagnosis is very important. It is considered to be a biphasic tumor made up of cells from squamous and spindle cells carcinoma with a sarcomatous aspect, but of epithelial origin. The diagnosis often represents a clinical-pathological challenge where the study with immunohistochemical technique (IHC) is key to the histopathological diagnosis. We present a case 45-years old female of spindle cell carcinoma at lateral border of tongue. Radical excision, SOHND, ALT Free Flap were performed as a treatment procedure.

## 4-C-4

## Nonsyndromic keratocystic odontogenic tumor

Myoung-Sang You, Kang-Min Ahn

*Department of oral and maxillofacial surgery,  
College of medicine, University of Ulsan,  
Asan medical center*

**Introduction:** Keratocystic odontogenic tumor (KOT) showed high recurrence rate during follow-up periods. The characteristics of the KOT are thin wall and easy to tear. In this study, nonsyndromic keratocystic odontogenic tumor was reviewed.

## 4-C-5

## Surgical treatment of calcifying cystic odontogenic tumor

Dong-Young Kim, Kang-Min Ahn

*Department of oral and maxillofacial surgery,  
College of medicine, University of Ulsan,  
Asan medical center*

**Introduction:** The calcifying cystic odontogenic tumor (CCOT) which is also known as calcifying odontogenic cyst or Golin cyst is a rare tumor arising in the jaw bone. The origin of the tumor is from odontogenic epithelium. CCOT has histopathological variants including cystic, tumor-like or malignant variation. Because of the rarity, long-term prognosis is not known. In this report, five CCOT patients were reviewed.

**Materials and methods:** Five patients who diagnosed as CCOT were included in this study. Male to female patients were 3:2 and average age was 23.6 years old. Anterior maxilla was involved in two patients and two anterior mandibles and one posterior mandible showed pathologic lesions. Enucleation and peripheral ostectomy was performed in all patients. Bone graft was performed in three patients with mandibular lesions.

**Results:** No patient reported recurrence of the lesions during follow-up periods. Healing process was uneventful and there was no infection after operation. Anterior mandible and maxilla were the most common sites for CCOT. There was no symptom of the lesions. One patient with involvement of the alveolar bone needed to remove involved teeth.

**Conclusion:** Recurrence was not reported in this study. Enucleation and peripheral ostectomy is the choice of the treatment. The long-term prognosis of CCOT is good and excellent with proper surgical removal.

4-C-6

## Survival of oral squamous cell carcinoma

Ji-Wan Kim, Kang-Min Ahn

*Department of oral and maxillofacial surgery,  
College of medicine, University of Ulsan,  
Asan medical center*

**Introduction:** Oral squamous cell carcinoma has been known with poor prognosis. Neck metastasis reduces the survival rate about 50 %. In this study, survival rate of oral squamous cell carcinoma has been investigated.

5-A-KS

## Aesthetic considerations in orthognathic surgery

Jong-Min Hwang

*Angle OMS Dental Clinic*

The main purpose of orthognathic surgery is the rehabilitation of functions and aesthetics. The functional rehabilitation in occlusion, speech and general health of patients is primary goal of orthognathic surgery. It can be obtained with the evaluation and treatment of hard tissue, such as teeth and facial bone. There is a relatively objective criteria and general consensus in functional achievement. But in the terms of aesthetics, it is very difficult to establish the consensual criteria of aesthetic achievement. Aesthetics tend to be evaluated by the subjective assessment of facial soft tissue by patients themselves. So in some cases, it is more difficult to obtain the patient's satisfaction in aesthetics than to obtain the satisfaction in functions.

In this presentation, I will review the various considerations of the soft tissue aesthetics in the orthognathic surgery. At first, the soft tissue volume of face should be evaluated, and should be properly reflected in the treatment planning of orthognathic surgery. In mandibular prognathism, the most patients have the reduced soft tissue volume on the mid-face and the increased volume on the lower-face. It can be improved by the clockwise rotation of maxillomandibular complex(MMC). The soft tissue aesthetic effects of MMC clockwise rotation will be presented with 3D analysis and clinical photos. Next, additional aesthetic surgeries that can be undergone simultaneously with orthognathic surgery will be proposed. Anterior malar augmentation with Medpor® can more increase the soft tissue volume in mid-portion of face. Mandibuloplasty ,including mandibular inferior border resection, can more reduce the soft tissue volume in lower portion of face. Mandibuloplasty can also change the lower face contour to more aesthetic slim line. Finally, the surgical supplemental method for the deficient pre-surgical orthodontic treatment in the aesthetic concern will be explained.

## 5-A-1

## Soft tissue analysis of midface after Le Fort I osteotomy

Hoon Joo Yang<sup>1,2\*</sup>, Soon Jung Hwang<sup>1,2</sup>

<sup>1</sup>Department of Oral and Maxillofacial Surgery, School of Dentistry, Seoul National University

<sup>2</sup>Orthognathic Surgery Center, Seoul National University Dental Hospital

It is difficult to determine the amount of vertical movement of maxilla after Le Fort I osteotomy, because changes of upper lip are very variable. Therefore, we analyzed soft tissue changes of midface including nose and upper lip following anteroposterior and/or vertical movement of maxilla, which would be helpful in the surgical planning of Le Fort I osteotomy.

The subjects were patients without severe facial asymmetry, maxillary midline displacement within 2mm and mandibular midline displacement within 4mm. Every patient underwent Le Fort I osteotomy. Preoperative and 6-month postoperative lateral cephalograms and 3D facial CT were analysis for total 143 patients. To prevent deformation of upper lip by contact with lower lip, lateral cephalogram was taken at rest state, without a direct contact between upper and lower lips.

The protrusiveness and vertical length of upper lip were changed depending on the anteroposterior change of the paranasal area by the vertical and anteroposterior movement of maxilla. The ratio of the change of upper lip length might allow more accurate surgical planning, more accurate vertical repositioning of the maxilla while maintaining an appropriate incisal exposure.

## 5-A-2

## Finite element analysis of the stresses according to the electromechanical distraction device in human mandibular symphysis

Chan-Woong Moon\*, Chul-Hong Koo, Tae-Hwan Kim, Moon-Young Kim, Se-Jin Han, Chul-Hwan Kim, Jae-Hoon Lee

*Dept. Of Oral and maxillofacial surgery, College of Dentistry, Dankook University*

**Introduction:** In the present study, a finite element analysis(FEA) was performed on application of newly developed electromechanical devices in mandibular symphyseal distraction osteogenesis for measuring the force exerted on the gears under overload condition and analyzing the probability of gear failure. In addition, bone strength and RPM conditions of system needed for bone movement of 0.8mm per day were measured; the results of which were as follows.

**Results:** Under overload condition, SUS402 J2 gear failure occurred first in Gear③ (Stress=278MPa), at which time the force exerted on the gear was approximately 16.7N. Under overload condition, SUS304 gear failure occurred first in Gear③ (Stress=245MPa), at which time the force exerted on the gear was approximately 15.4N. SUS402 J2 showed superior strength properties than SUS304 material. RPM of Gear① for bone movement of 0.8mm per day was approximately 0.005RPM. The maximum force of system mounting area required to push the chin bone in the center area by 0.8mm was 12.4N. Stress at over-yield point of SUS304 material was 15.4N, and thus, there was no gear failure and the safety factor was within 20%. Stress exerted during distraction of the chin bone in the center area by 0.8mm was 13.4MPa. The yield stress of compact bone was 60MPa, and thus, there was no bone breakage and the safety factor was within 22%.

**Conclusion:** Based on the results above, the newly developed electromechanical device was assessed to be suitable for use on human models. However, additional studies are needed to develop products that can be used in clinical settings.

5-A-3

## Virtual reality for surgical education in oral and maxillofacial surgery.

Seong-Yong Moon

*Dept. of Oral & Maxillofacial Surgery,  
School of Dentistry, Chosun University*

In today's surgical residency programs, most education in surgical skill takes place in the operating room(OR). There may never be a replacement for the live situation of the OR as the final environment for learning to perform operations. Surgeon's educational programs have been undergoing constant changes, not only in our country, but also internationally. The education for younger doctors treating jaw deformity patients is slightly different from each institution in terms of diagnostic tools, preoperative planning methods and surgical procedures. I would like to introduce our educational program for resident surgeons by presenting the past, present, future and discuss strategies to overcome barriers to enhance resident surgeon's training program. Computer-based education has assumed to have an increasing role in medical education.

Technological advances have created a diverse range of simulators that can facilitate learning and evaluation in numerous areas of medical education. Simulation technology holds great promise to improve physician training and, thereby, to impact patient safety and health care outcomes in a positive and significant way.

5-A-4

## Change of Hyoid and Pharyngeal Airway Volume after Mandibular Setback Surgery : 3-Dimensional Analysis

Hee-Sung Kim, Jae-Seok Lim, Seok-Hwan Hong,  
Yong-Bin Lee, Young-Soo Jung, Hwi-Dong Jung

*Dept. of Oral & Maxillofacial Surgery,  
College of Dentistry, Yonsei University*

An important aspect of orthognathic surgery is the effect of skeletal movements and changes in the position of hyoid bone, tongue, soft palate, pharyngeal airway. The pharyngeal upper airway has attracted much attention because snoring and sleep apnea are known to be closely associated with its volume. And hyoid bone is unique in that it does not articulate with any other bone and its position is determined by many muscles and ligaments.

Conventionally, postoperative changes in the upper airway have been analyzed using 2-dimensional lateral cephalograms. Although the lateral cephalogram has been used extensively as a diagnostic tool in the study of craniofacial morphology, it does not offer unique potential for 3-dimensional(3D) airway anatomy. Cone-beam computed tomography (CBCT) can distinguish the boundaries between the soft tissue and the airway space.

Among the patients who had received two-jaw(30 patients) orthognathic surgery and had taken 3D-CBCT at preoperatively and postoperatively at Oral and Maxillofacial Surgery Department, Yonsei University Dental Hospital, mandibular prognathism patients were selected randomly as subjects for this study. All patients operated orthognathic surgery and mandibular setback surgery by intraoral vertical ramus osteotomy(IVRO). Patients' pre-op & post-op 3D-CBCT images were reconstructed in 3D model(Skull, Pharyngeal airway) with using *Mimics® software*. And *Rapidform® software* was used to superimpose. All length was measured by *Mimics® software* using the reference plane. And all Pharyngeal airway space volume was measured by *3-matic® software*.

The aims of this study were to evaluate how the pharyngeal airway and hyoid bone position changed after orthognathic surgery in patients and to analyze the relations among upper airway changes, the change in the position of the hyoid bone using 3D CBCT.

**5-A-5****Evaluation of soft tissue changes around the mid-facial area after POGS using 3D CBCT**

Ho-Sung Lee, Hye-Min Cho, Smaro Park,  
Yong-Bin Lee, Hwi-Dong Jung, Young-Soo Jung

*Department of Oral and Maxillofacial Surgery,  
College of Dentistry, Yonsei University, Seoul, Korea*

3-Dimensional Cone Beam Computed Tomography (3D CBCT) is preferred for the analysis of orthognathic surgery(OGS) since its low radiation exposure dosage and less strict beam artifact to the ordinary CT scans. Especially it is possible to establish more precise surgical plan rather than 2-dimensional analysis tools such as cephalometric X-rays. For that reasons, 3D CBCT is widely used as the method of evaluation for surgical outcomes and studies of OGS, in addition to treatment planning.

Most of the conventional OGS cases requires orthodontic treatment before and after surgery. Recently pre-orthodontic orthognathic surgery(POGS) is selectively performed since its advantage in shortening of the total treatment duration.

In this study, we singled out 22 patients who received POGS among 634 patients who have received OGS at Yonsei University Dental Hospital during March 2013 to May 2015 and categorized them by the movement pattern of the maxilla. We examined the hard tissue and the soft tissue changes between pre-operative and the post-operative(POD 1 year) 3D CBCT images. The landmarks of the hard tissue and the soft tissue were assigned on the 3D reconstructed CBCT facial images. We superimposed pre-operative and post-operative CT images and measured the distance between landmarks of the two different period.

3D analysis in this study can be used to estimate the morphologic change, particularly the mid-facial area, such as the nose and the upper lip, in the patients who are planned to have POGS.



5-A-6

## Advance genioplasty using virtual surgical simulation in the OSA patient: A case report

Byungsoo kim\*, Baek Soo Lee, Yong Dae Kwon,  
Byung Joon Choi, Joo Young Ohe, Jung Woo Lee

*Dept. of Oral & Maxillofacial surgery,  
Kyung Hee University School of Dentistry*

Nowadays, the Virtual surgical simulation is widely used from implant prosthesis to reconstruction procedure on head and neck area. It is because advantage of this technique make us to execute the pre-planned surgery more accurately and smoothly using surgical guide based on the details of the whole steps of the surgery estimated previously.

There has been some cases in which advance genioplasty for expansion of upper airway of obstructive sleep apnea patients results unsatisfactory showing un-planned movement of the related anatomical structure. To overcome this limitation, the virtual surgical simulation for determining the target anatomical structure and jaw movement can be consider as a good option.

In this case, we assess the actual movement of the related structure and the degree of facial profile improvement and upper airway expansion after advance genioplasty using virtual surgical guide with Maxillomandibular advancement(MMA)

5-B-KS

## Repair of maxillary sinus membrane perforation by resorbable membrane and the evaluation of consequence

Hyeon-Min Kim

*Dept. of Oral and Maxillofacial Surgery,  
Gil Medical Center, Gachon University*

**PURPOSE:** The purpose of the present article is to evaluate the effectiveness of resorbable membrane for repair of maxillary sinus membrane perforation during the sinus bone graft and implant placement and report the evaluation of consequence with a review of literatures.

**MATERIALS AND METHODS:** 14 patients presenting maxillary sinus membrane perforation during the implant placement with bone graft are included. There are 11 males and 3 females and the mean age of the patients is 52 years. 39 implants had been placed in 16 areas. Sinus graft and implant placement procedure were performed by the lateral window approach with a piezoelectric device or bur. When the membrane perforation occurred, perforation was covered with resorbable collagen membrane (i.e. BioArm®, Bio-Gide®, collaTape®). After 1-2 weeks of healing, stich out was performed and the clinical evaluation of the complication and prognosis of the implant was executed with clinical and radiographic data.

**RESULTS:** The reasons of the membrane perforation are followed. It occurred during bony window formation in 8 areas, 4 areas were due to maxillary sinus septa or abnormal anatomy of the sinus, 3 areas were related with extraction socket communication and 1 area was related with cyst and inflammation in the sinus. Multiple perforations were occurred in 4 areas. The mean follow-up period was 3.9 years and 3 of 39 implants were failed. The initial stabilities of the failed implants were all poor. The 2 failed cases had 0 mm residual bone height on the surgery. There was no complication due to the membrane perforation.

**CONCLUSION:** The use of resorbable membrane for repair of maxillary sinus membrane perforation on bone graft and implant placement is effective and safe method. Therefore, I intend to report clinical study about perforated membrane repair using resorbable collagen membrane when maxillary sinus membrane was perforated with a review of literatures.

## 5-B-1

## Evaluation of healing process of AutoBT impregnated with rhBMP-2

Sang-Yun Kim<sup>1\*</sup>, Young-Kyun Kim<sup>1,2</sup>, Ju-Cheol Park<sup>2,3</sup>,  
Jeong-Kui Ku<sup>1</sup>, Pil-Young Yun<sup>1</sup>

<sup>1</sup>Department of Oral and Maxillofacial Surgery,  
Seoul National University Bundang Hospital, Seongnam,  
South Korea

<sup>2</sup>Department of Dentistry & Dental Research Institute,  
School of Dentistry, Seoul National University,  
Seoul, South Korea

<sup>3</sup>Department of Oral Histology, School of Dentistry,  
Seoul National University, Seoul,

**Purpose:** to evaluate the healing process of AutoBT impregnated with rhBMP-2 (AutoBT-BMP, Korea Tooth Bank, Seoul, Korea) and compare with autogenous bone

**Materials and Methods:** Unilateral upper 2<sup>nd</sup> and 3<sup>rd</sup> premolars of 8 beagles were extracted. The mucoperiosteal flap was elevated around extraction socket and bone defect was formed by surgical drill. Each AutoBT-BMP and autogenous bone were grafted at bone defect area with same collagenous membrane. Beagles were sacrificed at 2, 4, 8, 12 weeks after bone graft and block specimens involving grafted bone and surrounding nature bone were extracted. The specimens were taken with portable x-ray (DXR-1, EXARO, Seoul, Korea) and fixed using 2% formalin. Histomorphological evaluation was taken with fixed specimens.

**Results:** In the histological evaluation, 4 weeks after bone graft, autogenous bone showed 41% of new bone formation and AutoBT-BMP showed 5% of new bone formation. 8 weeks after bone graft, autogenous bone showed 46% of new bone formation and AutoBT-BMP showed 13% of new bone formation. At periapical radiograph, both groups showed newly formed bone which was continuously connected with the original bone.

**Conclusions:** Upon evaluation of new bone formation based on 8<sup>th</sup> weeks which showed highest osteoblast activity, AutoBT-BMP showed clinically significant new bone formation.

## 5-B-2

## Reconstruction of perforation about large maxillary sinus mucosa using a collagen membrane : Retrospective clinical study

Dong-Woo Kang<sup>1</sup>, Young-Kyun Kim<sup>1,2</sup> Pil-Young Yun<sup>1</sup>

<sup>1</sup>Department of Oral and Maxillofacial Surgery,  
Section of Dentistry, Seoul National University Bundang  
Hospital, Seongnam, Korea

<sup>2</sup>Department of Dentistry & Dental Research Institute,  
School of Dentistry, Seoul National University, Seoul,  
Korea

**Purpose:** To evaluate the clinical outcomes of reconstruction using a collagen membrane, when a large perforation occurs in the course of a sinus elevation.

**Patients and Methods:** This study included 18 patients who occurred a large perforation in the course of a sinus elevation at the Seoul National University Bundang Hospital, South Korea, between September 2011 and March 2014.(11 males, 7 females, mean age 55.1 years). The cases have a variety of 5mm-10mm perforating size. We reconstruct the perforations by using tissue additives, collagen membranes, and bone grafts. 13 patients had completed all treatments in the Seoul National University Bundang Hospital and the remaining 5 patients receive the implant surgery from other dental clinics. We checked the information of Implants, states of 1<sup>st</sup> and 2<sup>nd</sup> fixation, the types of complications, marginal bone loss, and resorptions of bone graft materials. We evaluated marginal bone resorption at 21 sites and resorptions of the maxillary sinus bone graft material at 19 sites using panoramic radiograph or CBCT. We calculated the resorptions which are the distance between the top of graft materials and the first thread of the implant fixture on the basis of radiographs after surgery.(1 years, 2 years, 3years, and final). We evaluated the marginal bone resorption calculating the average change in height to adjust the value of the mesial and distal relative to the first thread of implant fixture.

**Results:** The average absorption of bone graft materials to evaluate possible case after 1 year was 2.99mm(19 cases), after 2 years was 5.28 mm(8 cases) and after 3

## 5-B-3

## The Prognosis of dental implants which were installed during or after orthognathic surgery

Jun-Bum Lee\*, TH Sung, HY Kim, JE Yoon,  
JW Cho, JH Park, JW Kim, SJ Kim

*Dept. of Oral and maxillofacial surgery,  
Ewha Womans University Medical center*

years was 6.39mm(8 cases). The total average observation period of the patients was 27.5 months and the final average absorption was 4.76 mm. The number of postoperative complications was 8 of 18 patients. Screw loosening, peri-implantitis, pain, prosthesis dislodgement, hematoma, sinusitis, and bleeding were observed. Implant survival rate was 100% until the final follow-up period. The final alveolar bone resorption was 1.67mm around the implant

**Conclusion:** The reconstruction using collagen membrane of large maxillary sinus perforation is very effective and successful treatment. When the maxillary sinus elevation and bone grafting are performed properly using a collagen membrane, there are many advantages about stability of bone graft materials for a long time and good retention and fuction of maintaining implants.

**Purpose:** The purpose of this study is to find out whether implants installed on the bone with RAP has different prognosis and stability compare to those on the normal bone.

**Method:** Subjects of this study are comprised of patients who underwent orthognathic surgery and installed dental implant from 2010. At least 1 years follow up check was done after implant installation. Patients were classified in 3 groups. Group 1 is the patients installed dental implant during orthognathic surgery. Group 2 is the patients installed dental implant during plate removal. Group 3 is the patients installed dental implant after plate removal. Clinical and radiographical exam were conducted. Marginal bone level was evaluated with CT analysis in 3months, 6months and 1 year follow up check. ISQ and PTV were estimated in 1 year follow up. Mechanical and biological complications were also checked.

**Result:** Group 1 implants showed marginal bone loss, 1.83mm, 2.43mm, 4.23mm in 3month, 6months and 1 year follow up. Group 2 implants average marginal bone loss were 1.67mm, 2.13mm, 3.97mm in each time. Group 3 implants showed 1.52mm, 1.98mm, 2.96mm in each time. Average ISQ values were 54.7, 61.3, 69.7 in group 1,2,3. Average PTV were -0.72, -1.23, -2.19 in group 1,2,3. Biological complication showed 4 peri-implantitis and 4 peri-gingivitis in group 1(36 implants). 2 implants were retrieved because of peri-implantitis. 5 implants showed peri-implantitis and 1 implant showed peri-gingivitis in group 2(27 implants). 1 implant were retrieved due to peri-implantitis. 3 implants showed peri-implantitis and 2 implants showed peri-gingivitis in group 3(19 implants)

**Conclusion:** The later implant installed after orthognathic surgery, the better implant stability has shown. There were no significant difference in biological and mechanical complication in each groups.

## 5-B-4

## Case report: Maxillary sinus augmentation using rhBMP-2 in absorbable collagen sponge

Young Joon Hong\*, Soon Jung Hwang

*Department of Oral and Maxillofacial Surgery,  
School of dentistry, Seoul National University*

**Objectives:** Recombinant human bone morphogenetic protein 2 (rhBMP-2) accelerates new bone formation by facilitating the differentiation of mesenchymal stem cells to osteogenic cells. Compared to sinus floor augmentation using rhBMP-2 with allobone or xenobone graft, rhBMP-2 in absorbable collagen sponge(ACS) carrier has 2 benefits. 1. rhBMP-2/ASC can be used when sinus perforation happened. 2. In the cases using rhBMP-2/ACS, post-op maxillary sinusitis happens less frequently even after sinus perforation. The purpose of this study was to report the maxillary sinus augmentation using rhBMP-2 in absorbable collagen sponge.

**Methods:** This study examined the 7 patients who got sinus floor augmentation using rhBMP-2/ACS at Department of Oral and Maxillofacial Surgery, School of dentistry, Seoul National University from 2013 to 2016. Bone formation was evaluated using X-ray at preoperative phase, postoperative phase and six months after surgery.

**Results:** 6 patients yielded clinically meaningful bone formation after maxillary sinus augmentation that would allow placement of regular dental implants. Nevertheless, bone augmentation was decreased about 20~30% after 6months after surgery compared to that of postoperative phase.

**Conclusion:** rhBMP-2/ACS appears a promising alternative to autogenous bone graft for maxillary sinus augmentation. And it is also useful when sinus perforation happens.

## 5-B-5

## Temporomandibular disorders during or after dental implant treatment

Dae-Hoon KIM\*, Cheol-Hee JEONG, Jengbin PARK,  
Yuri CHOI, Jong-Ki HUH

*Department of Oral and Maxillofacial Surgery,  
Gangnam Severance Hospital,  
Yonsei University College of Dentistry, Seoul, Korea*

**Backgrounds and purpose:** Temporomandibular disorders (TMD) may occur during or after regular dental treatment. The aim of this study was to suggest management of the TMD during or after dental implant treatment.

**Materials and methods:** We analyzed the etiology, site of implantation, symptoms, treatments and improvements focused on TMD among patients who complained TMD symptoms during or after dental implant treatment.

**Results:** Total 19 patients complained of TMD associated with implant treatment. Thirteen patients complained of masticatory muscle pain, 13 patients complained of temporomandibular joint (TMJ) pain, and 8 patients complained of both muscle and TMJ pain. The patients were treated primarily with counselling, medication and physical therapy, and secondarily with occlusal splint therapy. Six patients received only the primary treatment, and their average recovery time was 4.2 months. Four patients received the secondary treatment and their average recovery time was 8.5 months. No patient underwent surgical intervention of TMJ.

**Conclusion:** Patients who have risks of TMD may experience symptoms of TMD, such as facial pain, masticatory myalgia, TMJ pain and mouth opening limitation during or after implant treatment. To mitigate these symptoms, we suggest applying the usual treatment protocols for TMD.

**5-C-KS****Minimally invasive surgery  
in oral and maxillofacial region**

Woong Nam, DDS, PhD

*Department of Oral and Maxillofacial Surgery,  
College of Dentistry, Yonsei University*

A Minimally invasive procedure is any procedure (surgical or otherwise) that is less invasive than open surgery used for the same purpose. Recently, oral and maxillofacial surgery is entering a new era with the development of endoscopic and robot surgery. The success of minimally invasive surgical techniques across multiple specialties has challenged oral and maxillofacial surgeons to develop ways in which to replace maximally invasive, open procedures with those that offer less morbidity, shorter lengths of stay, and fewer post-surgical complications for the same functional and aesthetic result. Maxillofacial trauma (esp. subcondylar fracture), orthognathic, temporomandibular joint surgery, implant insertion, distraction osteogenesis, segmental mandibulectomy and reconstruction, sialolithectomy, cyst enucleation, parotidectomy, and neck dissection surgery are commonly performed via a minimally invasive approach. In this presentation, the author is going to present the current status, its pros and cons, and the results of minimally invasive surgery in oral and maxillofacial region.

**5-C-1****Postoperative 3-dimensional evaluation  
of mandibular contouring surgery  
using computer assisted simulation  
planning and 3-dimensional printed  
surgical guide.**\*<sup>1</sup>Hyun Seok, <sup>1</sup>Seong-Gon Kim, <sup>1</sup>Kwang-Jun Kwon,  
<sup>1</sup>Young-Wook Park, <sup>2</sup>Yong-Chan Lee*<sup>1</sup>Department of Oral and Maxillofacial surgery,  
College of Dentistry, Gangneung-Wonju National University  
<sup>2</sup>Department of Oral and Maxillofacial Surgery,  
Bestian Seoul Hospital, 429, Dogok-ro, Gangnam-gu,  
Seoul 135-998, South Korea.*

Mandibular contouring surgery has been planned by 2-dimensional image such as lateral cephalometric view, panoramic view and additional cone beam computed tomography (CBCT) image. Recently, surgical treatment plan of mandibular contouring surgery and orthognathic surgery are performed using computer assisted simulation planning (CASP) and 3-dimensional fabricated surgical guide. In this case, we performed mandibular contouring surgery using CASP and 3D printed surgical guide and evaluated the result of the surgery.

A 23-year-old man was visited for his residual facial asymmetry on left mandibular angle and mental area. He has been undergone bimaxillary orthognathic surgery before 5 years for facial asymmetry. He was undergone mandibular contouring surgery according to the CASP. For evaluation the accuracy of the CASP and surgical guide, we compared the CASP image and postoperative CBCT by image overlapping and could find the left mandibular angle and inferior border have been removed more than the amount of CASP. In the operation, the surgical guide was not adapted left mandibular inferior border due to the presence of the mental foramen. Because of this poor adaptation, the planned osteotomy has not been conducted and it led to excessive osteotomy.

The mandibular contouring surgery using CASP and 3D printed surgical guide can be done more accurately compared with the traditional surgical plan using 2D image. We performed mandibular contouring surgery using CASP and 3D printed surgical guide. However it

was not accomplished according to the CASP, due to the limitation of adaptation of the surgical guide. For the accurate planning and satisfactory result of surgery, the shape of the surgical guide and adaptation area have to be evaluated.

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#### 5-C-2

### Forehead augmentation performed with orthognathic or facial contouring surgery: Case report

Young-Wook Park\*, Sung Ho Shin, Seong-Gon Kim, Min-Keun Kim, Kwang-Jun Kweun

*Department of Oral and Maxillofacial surgery,  
College of Dentistry, Gangneung-Wonju National University*

Orthognathic surgery or facial contouring surgeries have been performed by oromaxillofacial surgeons for more esthetic face of patients. Surgeries performed by oromaxillofacial surgeons lead more balanced face to patients by skeletal correction of middle and lower third of face. However, upper third of face also have an decisive effect on balanced and esthetic face.

The shape of the forehead has the most critical effect on impression of upper third of face. Generally, convex and wide forehead gives more feminine impression than flat or depressed forehead. So forehead augmentation is getting more popular among females in South Korea these days.

Variable surgical methods have been used for forehead augmentation. Autogenic fat graft or Alloplastic materials like silicone, Gore-tex, hyaluronic acid filler have been used for forehead augmentation and their pros and cons were also reported in many literatures. Among them, forehead augmentation with silicone implant has several advantages: there is no significant change of implant for times and surgical procedure is simple and safe.

The first patient of this presentation visited our clinic for correction of facial asymmetry. After analysis of radiographic images and clinical photos, orthognathic surgery and malar plasty, and forehead augmentation were performed. The second patient visited our clinic for esthetic surgery. After analysis of radiographic images and clinical photos, malar plasty, narrowing genioplasty and forehead augmentation were performed. In both patients, we achieved more esthetic result comparing with orthognathic surgery or facial contouring surgery alone.

In this clinical presentation, author will report about surgical technique, result of surgery and precautions during and after surgery of forehead augmentation performed with orthognathic surgery or facial contouring surgery.

5-C-3

## Individualized Treatment Planning for Asian Patients with Obstructive Sleep Apnea Syndrome: Modification of Maxillomandibular Advancement

Sung ok Hong<sup>1</sup>, Jin-Young Choi<sup>2</sup>

<sup>1</sup>Catholic Kwandong University International St. Mary's Hospital

<sup>2</sup>Seoul National University School of Dentistry, Dept. of Oral and Maxillofacial Surgery

**Aim:** To introduce the esthetic and functional effect of modified maxillomandibular advancement (MMA) surgery in obstructive sleep apnea syndrome (OSAS).

**Methods:** 8 Korean adult patients with OSAS underwent MMA or modified MMA surgery by a single surgeon (7 males / 1 female, mean age: 26 years old). Four OSAS parameters [Body mass index (BMI, kg/m<sup>2</sup>), apnea-hypopnea index (AHI, number/hour), respiratory disturbance (RDI, number/hour), and lowest saturation rate (LSAT, %) from nocturnal polysomnogram] and five cephalometric measurements (SNA, SNB, FMA, U1 to FH, nasolabial angle) were investigated before (T1) and 6 months after MMA/ modified MMA surgery (T2).

**Results:** At T1 stage, no significant differences were seen in OSAS parameters between MMA and modified MMA groups. Cephalometric measurements differed: MMA group exhibited relative maxillary and mandibular hypoplasia (SNA, 78.5° ; SNB, 71.9° ), obtuse nasolabial angle (102.6° ) and normal inclination of maxillary incisors (U1 to FH, 102.9° ). Modified MMA patients had normal sagittal position of the maxilla (SNA, 81.0° ), normal nasolabial angle (90.2° ) and slightly labio-versed maxillary incisors (U1 to FH, 110.5° ).

Both showed improvement of OSAS parameters without significant difference at T2 stage (AHI, 44.9 to 7.6; RDI, 50.7 to 11.0; LAST, 84.5 to 88.3 in MMA g; AHI, 35.8 to 5.7; RDI, 41.6 to 10.8; LSAT, 86.8 to 91.5 in modified MMA). The success rate was 87.5%. Difference in cephalometric measurements from T1 to T2: MMA group showed improvement of maxillary and mandibular deficiency and decrease in obtuse naso-

labial angle. Modified MMA group exhibited no significant advancement in the sagittal position of the maxilla and mandible, increase of nasolabial angle acuteness and less labioversed maxillary incisors.

**Conclusion:** In OSAS cases with relatively normal or forward positioned maxilla, acute or normal nasolabial angle and labioversed maxillary incisors, modified MMA surgery can improve sleep results while maintaining esthetics.

## 5-C-4

## Botox injection for the treatment of a “gummy smile”

Yong-Jae Joung, Kang-Min Ahn

*Department of oral and maxillofacial surgery,  
College of medicine, University of Ulsan, Asan medical  
center*

**Introduction:** A gummy smile is defined as 2mm or more gingival exposure during smile. Excessive gingival display is considered unesthetic and requires treatment. There are several reasons for a gummy smile. One is excessive maxillary growth which require Le Fort I osteotomy for correction. Others are hyperfunction of lip levator muscles and bony exostosis. In this study, hyperfunction of the lip levator muscles was treated with Botox injection and reviewed.

**Materials and methods:** Five patients who reported gummy smile were included in this study. All five patients were female and average age was 40.4 years old. Four patients showed bony exostosis combined with hyperfunction of the lip levator muscles. Two patients received Botox injection.

**Results:** Grinding of the bony exostosis was performed under local anesthesia. Botox was injected in the both sides of the nasolabial fold about 10–15 units. All patients were satisfied with the results. There was no gingival recession after grinding of the bony exostosis. Six months after injection and grinding, there was slight rebound of the hyperfunction of the lip levator muscles, however, there was no need for reinjection of the Botox.

**Conclusion:** Diagnosis of the gummy smile looks easy, however, the precise reasons should be differentiated during diagnosis. Oral and maxillofacial surgeon should identify the reason and plans the treatment of gummy smile.

## 5-C-5

## From Upper Airway Reconstruction to Upper Airway Stimulation in OSA Surgery – A Case Report

Sung ok Hong<sup>1</sup>, Yong Dae Kwon<sup>2</sup>,  
Stanley Yung Chuan Liu<sup>3</sup>

<sup>1</sup>*Catholic Kwandong University International St. Mary's  
Hospital*

<sup>2</sup>*Kyung Hee University Dental Hospital,  
Dept. of Oral and Maxillofacial Surgery*

<sup>3</sup>*Stanford University School of Medicine,  
Dept. of Otolaryngology*

**Introduction & Aim:** Obstructive sleep apnea (OSA) is characterized by repeated episodes of upper airway collapse leading to oxygen desaturation during sleep, leading to significant cardiovascular and neurocognitive sequelae. Continuous positive airway pressure (CPAP) as the first-line treatment has a low patient adherence rate. This led to the development of upper airway reconstructive surgeries including palatopharyngoplasty, tongue base surgery, and maxillomandibular advancement. Upper airway stimulation via an implantable device for the hypoglossal nerve is a newly available alternative that we would like to introduce.

**Methods & Results:** We report the case of a 65 year old man with severe OSA (AHI 89.1) and diabetes who was referred to the senior author for surgical treatment. Advanced age and co-morbidities prompted recommendation to repeat CPAP after treating nasal obstruction with septoplasty and turbinate reduction. The patient remained intolerant of CPAP, and was screened for hypoglossal nerve stimulation (HGNS) with drug-induced sleep endoscopy (DISE). Complete concentric collapse (CCC) at the velum during DISE was reversed with palatopharyngoplasty to meet selection criteria for HGNS. Postoperative reduction of AHI demonstrated surgical success, with resolution of daytime somnolence.

**Conclusion:** Appropriate patient selection for HGNS adds to the surgeon's ability to individualize effective surgical treatment of OSA.



6-A-KS

## ***In vitro* biomechanical evaluation of fixation methods of sagittal split ramus osteotomy in mandibular setback**

Ji-Su Oh

*Dept. of Oral & Maxillofacial Surgery,  
School of Dentistry, Chosun University*

Sagittal split ramus osteotomy (SSRO) is the most popular orthognathic surgical procedure for treatment of congenital and developmental deformities of mandible. Numerous modifications of the fixation methods in SSRO have been proposed, however the ideal method of fixation has not yet been established. Adequate fixation can provide sufficient resistance to the forces that cause micromovements across the osteotomy site. Rigid fixation provides skeletal stability, fast bony healing, early recovery of mandibular function, and easier airway maintenance. However, temporomandibular dysfunction due to displacement of the condyle and irreversible nerve damage from excessive compression can occur. Also, the transcutaneous approach can cause a skin scar. An advantage of monocortical fixation is that an intraoral approach is possible. The injury of inferior alveolar nerve is lessened as compared with bicortical fixation. If the location of condyle during surgery is wrong, it is easier to readjust. However, monocortical fixation has insufficient stability and intermaxillary fixation (IMF) which may lead to muscular atrophy, airway obstruction risk and temporomandibular joint problems is needed.

In this presentation, biomechanical effectiveness of various fixation methods in SSRO for mandibular setback through *in vitro* experimental studies will be presented.

6-A-1

## **Analysis of the Condylar Positioning after Intraoral Vertico-sagittal Ramus Osteotomy**

Pill-Hoon Choung, Seung-Kee Shim\*, Soo-Ho Kim,  
Han-Wool Choung

*Dept. of Oral & Maxillofacial Surgery, Cranio-Maxillo-Facial Syndrome Plastic Clinic, Tooth Bioengineering National Research Lab., School of Dentistry, Seoul National University, Seoul, Korea*

**Purpose:** Intraoral vertico-sagittal ramus osteotomy is designed for physiologic positioning of the condyle after surgery. We investigated the long term, large patients group to verify this benefit of the surgical technique.

**Methods:** We selected 60 patients randomly and investigated them, who underwent IVSRO performed by one surgeon from May, 2011 to Jan. 2016. We compared the position of condyle before and after the surgery.

**Results:** Among the 60 patients, 120 condyles, 87 condyles (73%) showed no change. 17 condyles (14%) showed anterior positioning, and 16 condyles (13%) showed inferior positioning compared than the preoperative condylar positioning. There was no posterior positioning.

Among the 60 patients, 13(81%) of 16 patients who has previous TMJ symptom like pain, noise and trismus before surgery showed anterior or inferior positioning than the original site of the condyle. 35 (80%) of 44 with no TMJ symptom showed no position change.

**Conclusion:** After IVSRO, most condylar positioning did not change in case of the patients who has no TMJ symptom. In patients with previous TMJ symptoms (pain, noise and trismus), the positioning of the condyle showed anterior-inferior positioning resulting improvement of TMJ symptoms ; it verifies the condylotomy effect.

## 6-A-2

## Proximal segment position change on stability of sagittal split ramus osteotomy for mandibular prognathism with and without asymmetry

Aditi Sharma, Jun Young Paeng, Jin Wook Kim, So Young Choi, Tae Geon Kwon

*Dept. of Oral and Maxillofacial Surgery, Kyungpook National University Dental Hospital*

**Purpose:** Changes in position of proximal segment including condyle can be occurred after Sagittal Split Ramus Osteotomy(SSRO). The aim of this study is to compare the 3-dimensional spatial position of proximal segment in deviated and non-deviated mandibular prognathism patients after the surgery and evaluate whether these changes can influence the stability of the surgical outcomes.

**Materials and Methods:** The study included in a total of total of 50 patients. Study group (n=25) consist of patients with deviated mandibular prognathism over than 5mm at chin point (Me). The deviated side (short side) was set at right side. Control group (n=25) consist of patients with minimal menton deviation (<4mm). CT raw data were collected before surgery, immediately after surgery, 6 months or 12 months after surgery. Simplant Software was used to measure 3-dimensional spatial change in condylar position mediolaterally and condyle to fossa relation in deviated and non-deviated mandibular prognathism after surgery.

**Result:** The deviated site of proximal segment was clockwise rotated to the medial side, which improves the bilateral symmetry of the ramus. However, the ramus-condyle inclination change by surgery did not significantly influenced the transverse chin position at follow-up period.

**Conclusion:** The result implies that intentional changes of condyle-ramus inclination during the surgical correction of asymmetric mandibular prognathism does not significantly influence the stability of surgery.

## 6-A-3

## Mandible body ostectomy for the treatment of Mandibular prognathism

Do-Hyun Jeon\*, Sung-Hoon Byun<sup>2</sup>, Hee-Chan Park, Sung-Hoon Byun<sup>1</sup>, Dae-Young Kim, Jong-ho Choi, Jang-Ho Son, Iel-Yong Sung, Yeong-Cheol Cho

*Department of Oral and Maxillofacial Surgery, Ulsan University Hospital, College of Medicine, Ulsan University*

Mandible body ostectomy is a procedure designed to retrude mandible by shortening mandible body length. It was first introduced by Blair in 1906 and step ostectomy was first performed by Converse and Shapiro (1952) and had been used.

Indications for this procedure are edentulous mandibular prognathism, Mandibular prognathism with remaining edentulous space, cases where occlusion in the posterior is normal and retraction of whole mandible would cause malocclusion in the posterior area.

Advantages of this procedure are enough set back amount using extraction site. Moreover, desired occlusion can be achieved with anterior segment surgery only if the normal occlusion is already achieved in the posterior segment. Additionally, if set-back amount is great, it can be used simultaneously with other procedures.

Disadvantage of this procedure is possibility of nerve damage. Even with step ostectomy, osteotomy line should be accurate to avoid tooth root damage and desired occlusion. Moreover, it can only be applied in mandible prognathism.

Recently, due to the complexity of the procedure and complications of nerve damage, body ostectomy is performed in limited situations. In this presentation, we would like to present our cases of body ostectomy performed at oral and maxillofacial department in recent 5 years

6-A-4

### Predisposing factors affecting to postoperative skeletal stability in class III malocclusion patients : analysis by recurrence rates

Young-jae Baek\*, Young-Deok Kim,  
Hyo-Geon Kim, Jae-Min Song, Jae-Yeol Lee,  
Dea-Seok Hwang, Sang-Hun Shin, Uk-Kyu Kim

*Dept. of Oral and Maxillofacial Surgery,  
School of Dentistry, Pusan National University*

Post-operative stability is a key factor of orthognathic surgery, and various factors are known to affect skeletal stability of post-operative period; re-orientation method of condyle of mandible, method of fixation between proximal and distal segment of mandible, period of intermaxillary fixation, direction and amount of surgical movement, age and growth pattern, etc. These factors have independent effect, as well as constitute the complex interrelationships. In this study, for precise and predictable results, we analyzed the predisposing factors affecting to skeletal stability of orthognathic surgery in Class III malocclusion patients.

A total of 153 patients with Class III malocclusion had orthognathic surgery from November 2013 to July 2015 at Oral and Maxillofacial Surgery of Pusan National University Dental Hospital. All patients had surgery from the same surgeon. We evaluated the cephalographic images and cone-beam CT images (pre-OP., immediately after OP, and 6 months after OP). the skeletal relapse rate was calculated and compared to the results which reported previously. Furthermore, we analyzed the known factors which had reported whether they affect to the stability in this study. In addition, by evaluating the high/low recurrence rate groups in this study, analysis performed on the predisposing factors that are associated with post-operative skeletal stability.

6-A-5

### Measurement of change amount of soft tissue around nose after Orthognathic surgery (Lefort I Osteotomy).

Seung-Il Jang\*, Jaemyung Ahn, Jongrak Hong,  
Chang-Soo Kim

*Dept. of Oral and maxillofacial surgery,  
Samsung Medical Center,  
Sungkyunkwan University School of Medicine*

**Introduction:** Nose is very important on human's facial component not only its absolute area in face but also components of esthetic. Nose is very sensitively changed when having orthognathic surgery(Lefort I)

Its changes are sometimes advisable, but also sometimes negative. It's very important to have a plan for this changes in advance. Our purpose for this study is to know about a tendency of nose around tissue when maxilla is setback or advance.

**Method:** patients of having Lefort I Osteotomy in Samsung Medical Center are surveyed. We restructure Helical CT Data to Soft Tissue Data. We set up the Landmark. Nasolabial angle, Alar base length, Nasofrontal angle, Ratio of Nostril are measured.

**Discussion:** the aboves will help for the prediction of flattening nose and necessity or degree of alar cinch suture after Lefort I Osteotomy. predicting of this result in analysis stage and including Additional surgical treatment for nose after orthognathic surgery are very important to raise degree of patient's satisfaction and devise a more predictable surgical plan.

**6-A-6**

## Contemporary Orthognathic Preparation for the Orthognathic Surgery : Do we have to need the surgical wire for 4 weeks before the surgery?

Hyeong-Geun Lee\*, Yong-Deok Kim, Hyo-Geon Kim, Jae-Min Song, Jae-Yeol Lee, Dae-Seok Hwang, Sang-Hun Shin, Uk-Kyu Kim

*Dept. of Oral and Maxillofacial Surgery,  
School of dentistry, Pusan National University*

In orthognathic surgery with orthodontic treatment, presurgical stability period, intraoperative and postoperative intermaxillary fixation and intermaxillary guidance considerably affect the accuracy and final results of surgery .

Traditionally, we know that the stability wire need to be prepared in at least 4 weeks before surgery, so does passive state of stability wire when the impression for surgical splint taken.(generally, 1~2 weeks before surgery) Otherwise, recently, 2-jaw surgery with minimal orthodontics or before the orthodontics is preferred. Even, 2-jaw surgery without orthodontics is reported.

We do a study about the clinical needs of the surgical wire for 4 weeks before the surgery and how it affect the post-operative stability.

We compare the surgical wire for 4weeks before the surgery to other groups which are the cases with rectangular wire, NiTi and none(does not proceed orthodontics). We study about 174 patients who has 2-jaw surgery for correction of class III malocclusion in Dept. of Oral and Maxillofacial Surgery, Pusan National Univ. Dental Hospital from a November, 2013 to July, 2015. We compare 2 cephalograms between postoperative and 6~12 months after surgery about FH-palatal, FH-occlusal, FMA, SNA, SNB and so on in the lateral cephalograms

If surgical stability wire would not make a better results, we could drop the stability period which increase the treatment period and needless surgical wire-making course

**6-B-KS**

## 3D planning for Orthognathic surgery

Hwi-Dong Jung

*Department of Oral & Maxillofacial Surgery,  
Yonsei University, College of Dentistry, Seoul, Korea*

Computer-aided surgical simulation (CASS) has greatly enhanced the efficiency and accuracy of orthognathic surgery (OGS) for correction of dentofacial deformities. And, virtual surgical planning (VSP) improves the efficiency of the presurgical work-up and provides an opportunity to illustrate the multidimensional correction at the dental and skeletal level, provides preoperative insight into the surgical intervention, and has proved accurate in the transfer of the virtual plan to the operating room.

In this presentation, the process for preparing CASS and VSP in OGS field, and the efficiency will be presented, and accuracy and efficiency of this process will be discussed.

6-B-1

## The in-vitro effect of Polydeoxyribonucleotide(PDRN) to Osteoblast cell Proliferation

Jong Chan Park<sup>1</sup>, Bong Chul Kim<sup>1</sup>, Hun Jun Lim<sup>1</sup>, Young Deok Chee<sup>3</sup>, Jun Lee<sup>1,2</sup>

<sup>1</sup>Department of Oral and Maxillofacial Surgery, Daejeon Dental Hospital, College of Dentistry, Wonkwang University, Daejeon, Korea

<sup>2</sup>Wonkwang Bone Regeneration Research institute, Wonkwang University

<sup>3</sup>Department of Oral and Maxillofacial Surgery, Sanbon Dental Hospital, Wonkwang University

Polydeoxyribonucleotide(PDRN) is a DNA polymer and a cell regeneration enhancing material, that can be assimilated from seminal glands of Salmons. PDRN contains Deoxyribonucleotide polymer and advances tissue regeneration by stimulating A2 purinergic receptor. PDRN is also taking spotlight as a functional material for cosmetics.

Applying PDRN shows not only accelerated suture via superior tissue regeneration and enhanced wound care, but also easing scars or faster tissue regeneration after plastic surgery. Furthermore, PDRN act as a growth promoters for osteoblast and It is expected to contribute to bone regeneration in Oral and Maxillofacial region.

In this experiment, The in-vitro effect of PDRN is compared with control group about osteoblast cell proliferation, cytotoxicity, cell adhesion, and osteoblast differentiation using MG-63 osteoblast-like cells respectively

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6-B-2

## The osteogenic potential of a moldable demineralized dentin matrix in rabbit skulls

Yong-Chan Ha\*, Won-Gyo Seo, Moon-Young Kim, Se-Jin Han, Chul-Hwan Kim, Jae-Hoon Lee

Dept. of Oral and maxillofacial Surgery, College of Dentistry, Dankook University

**Introduction:** Autogenous tooth bone graft has great advantageous to biocompatibility and an immune. However demineralized dentin matrix(DDM) could occur the loss of bone substitutes and could be difficult to graft ideal form. This research uses DDM from human tooth mixed with hydroxypropyl methycellulose(HPMC) as a graft material in cranial defects of rabbits, and compares osteogenic potential.

**Materials and Methods:** 12 rabbits, raised under the same conditions. Round defect 8mm in diameter was formed on both side of a exposed cranium, moldable DDM mixed with HPMC on the left(experimental group), nothing on the right was grafted(control group). 4 rabbits were sacrificed at each week of 1, 2, 4weeks after the experiment. The specimens were evaluated via micro-CT, histologic observation and a histomorphometric study.

**Results:** In the control groups, new bone was generated only around the boundary of defects. However, new bone was generated both around the boundary of defects and periphery in the experimental groups.

After the histologic observation, moldable DDM grafted groups showed more activity of osteogenic cells and more new bone formation.

In histomorphometric analysis, there was no statistical significance.

**Conclusion:** In conclusion, although newly developed moldable DDM showed no statistical significance between two groups, there were no immune response with excellent osteogenic potential

## 6-B-3

## Translational research for bone regeneration by the conditioned medium from mesenchymal stem cells after maxillary sinus floor elevation

Wataru KATAGIRI<sup>\*1</sup>, Junna WATANABE<sup>2</sup>,  
Naoto TOYAMA<sup>2</sup>, Kohei SAKAGUCHI<sup>2</sup>,  
Yukiko SUGIMURA-WAKAYAMA<sup>2</sup>, Masashi OSUGI<sup>2</sup>,  
Taku KOJIMA<sup>1</sup>, Tadaharu KOBAYASHI<sup>1</sup>

<sup>1</sup>*Division of Reconstructive Surgery and Oral and Maxillofacial Region, Niigata University Graduate School of Medical and Dental Sciences, Niigata, Japan*

<sup>2</sup>*Department of Oral and Maxillofacial Surgery, Nagoya University Graduate School of Medicine, Nagoya, Japan*

**Introduction:** We have reported that the bone marrow derived mesenchymal stem cells (MSCs) secrete numerous cytokines into the cultured conditioned medium (CM) and the serum-free CM from MSCs (MSC-CM) includes such cytokines and has a great potential for angiogenesis and osteogenesis. In this study, the effects of MSC-CM on bone regeneration after maxillary sinus floor elevation (SFE) were examined.

**Method and Materials:** In all experiments, MSC-CM was prepared from the conditioned medium from human bone marrow-derived MSCs. In the preclinical trial, rabbit bone marrow-derived stem cells (rMSCs) were cultured with MSC-CM and their mobilization and proliferation were evaluated. Beta-tricalcium phosphate scaffolds ( $\beta$ -TCP) were impregnated with MSC-CM and grafted in the rabbit maxillary sinus cavities. At 2 and 4 weeks after transplantation, sections of the newly formed bone were evaluated histologically. In the clinical trial, six partially edentulous patients were enrolled in this study. MSC-CM was mixed with  $\beta$ -TCP and implanted to the cavity after SFE in four patients, while only  $\beta$ -TCP was implanted after SFE in the other two patients as a control. Six months after SFE, bone biopsies and histological assessments were performed.

**Results:** In the preclinical trial, MSC-CM increased the migration and proliferation of rMSCs and the early bone regeneration in rabbit sinus. Histological analysis

revealed that the cell proliferation and vascularization were increased at 2 weeks after SFE in MSC-CM group compared with a control. In the clinical trial, histological analysis revealed that the bone volume was significantly greater in the MSC-CM group and newly formed bone consisted of lamellar bone with vascularization in the MSC-CM group. These findings agreed with the results from the preclinical study.

**Conclusions:** MSC-CM enhanced vascularization and early bone formation after SFE. From this translational research suggests that MSC-CM is a promising novel therapeutic agent to promote bone regeneration.

6-B-4

## Effects of locally applied BMP-2 and alendronate carried by $\beta$ -TCP on bone regeneration

Na Ri Kim<sup>1,2\*</sup>, Beom Seok Lee<sup>2</sup>, In Sook Kim<sup>2</sup>,  
Soon Jung Hwang<sup>1,2</sup>

<sup>1</sup> Dept. of Oral and Maxillofacial Surgery,  
School of Dentistry, Seoul National University  
<sup>2</sup> Dental Research Institute, Seoul National University

### Introduction

In orthopedic surgery, alloplastic bone substitutes have been frequently utilized with osteoinductive growth factors, such as bone morphogenetic protein-2 (BMP-2), to induce new bone formation. However, initial burst release of BMP-2 and osteoclast activation by high-dose of BMP-2 resulted in reduced bone forming effect. We tested bone forming effects of beta-tricalcium phosphate ( $\beta$ -TCP), containing BMP-2 to induce bone, and alendronate (ALN) to delay early bone resorption. The present study was aimed evaluate the effect of combined application of BMP-2 with ALN on new bone formation in a critical sized rat calvarial defect model.

### Method and materials

1. Mouse mandible-derived osteoprogenitor cells were treated with BMP-2 (200 ng/mL) and various concentration of ALN (1, 10, and 100  $\mu$ M). MTT assay and ALP activity were performed on day 1 and 3. Mouse bone marrow macrophages were differentiate into committed osteoclast precursors and stained with leukocyte acid phosphatase staining kit on day 7.
2. BMP-2 release kinetics; In order to assist in adhesion of the ALN onto calcium phosphate ceramics, 30  $\mu$ g of ALN is deposited on the surface and allowed overnight dry. BMP-2 was loaded directly into  $\beta$ -TCP and ALN coated  $\beta$ -TCP.
3. Rats with a surgically induced 8-mm critical sized defects were separated into four groups:  $\beta$ -TCP,  $\beta$ -TCP with BMP-2,  $\beta$ -TCP with ALN, and  $\beta$ -TCP with BMP-2 and ALN administered 1, 4,

and 8 weeks after surgery.  $\beta$ -TCP with 40  $\mu$ g BMP-2 and 30  $\mu$ g ALN were placed in the defect. Early osteogenic process was examined with real time RT-PCR and bone formation was analyzed by  $\mu$ CT, histology, and histomorphometry.

### Results

The combined use of BMP-2 and ALN in mouse jaw bone derived osteoprogenitor cells showed no cytotoxicity but enhanced ALP activity over control group. However, in higher dose ALN showed decreased cell viability and osteoblastic differentiation even in presence of BMP-2. The *in vitro* BMP-2 release in the BMP/ALN exhibited a slower release rate whereas the BMP alone group showed an initial burst phase. In spite of lower release of BMP-2 in presence of ALN both the BMP-2 and BMP/ALN groups showed higher expression of bone forming and resorbing markers within the scaffold at defect after 7 days. Micro-computed tomography (micro-CT) and histology revealed that the BMP/ALN led to better bone quantity and quality at the central defect area over time, whereas the BMP alone exhibited excessive ossification with less bone quality. ALN treatment reduced the expression of adipogenic markers and the amount of bone marrow cavities also decreased.

### Conclusion

In conclusion, we proved the advantage of  $\beta$ -TCP use in BMP/ALN delivery on the basis that ALN induces a lower burst and subsequent sustained release of BMP-2. Notably, ALN reduced bone marrow cavities, induced by BMP-2, by inhibition of adipocyte markers. These findings suggest that co-delivery of BMP-2 with ALN is effective in terms of quality and quantity of the newly regenerated bone.

## 6-C-KS

## Current concepts of microvascular reconstruction after tumor ablation

Kang-Min Ahn

*Department of oral and maxillofacial surgery,  
College of medicine, University of Ulsan*

Microsurgical reconstruction of the oral and maxillofacial area is a challenging procedure which requires relatively long surgical time. Reconstructive surgeon should know the exact anatomy of the donor site and can dissect neck vessels and restore the removed structure with available flaps functionally as well as esthetically and socially. Oral cancer surgery requires neck dissection and mass excision which require skin incision. The cancer in the posterior tongue and mandible or retromolar area is hard to approach through per os. Most of ENT surgeons use lip splitting and mandible swing technique to get access to the posterior oral cavity. The visibility and surgical access are excellent, however, postoperative scar is clearly seen after operation and it requires longer surgical time.

The first trend of maxillofacial ablative surgery is less invasive and minimal incision and esthetic approach. Visor or pull-through approach with lingual releasing incision could be used for esthetic result and minimum operation time which is related with early postoperative recovery.

Routine tracheostomy for oral cavity cancer is not necessary. It is quite cumbersome after operation and the patient's discomfort is more than surgeon's expectation. I performed oral cavity cancer last 11 years without tracheostomy. I preferred over-night intubation for patients' recovery and early oral intake.

The second trend of microsurgical reconstruction is to minimize the second donor site. Latissimus dorsi, fibular and lateral thigh flap could be closed primarily. However, radial forearm free flap which is the most versatile flap for oral cavity reconstruction requires second donor site for partial skin graft. To reduce this cumbersome surgery, double layered collagen graft could be used for alternatives.

In this presentation, I would like to present patients with oral cavity cancer reconstructed with current surgical technique. This includes esthetic approach, preservation of the critical anatomic structure and collagen graft for donor site healing of the radial forearm free flap.

## 6-C-1

## Fibular free flap reconstruction of the mandible in oral squamous cell carcinoma

Jong-Hyun Hwang, Kang-Min Ahn

*Department of oral and maxillofacial surgery,  
College of medicine, University of Ulsan,  
Asan medical center*

**Introduction:** Oral squamous cell carcinoma(OSCC) invading the mandible is classified as stage IV and often requires segmental mandibulectomy. Free fibular flap is the most useful flap for the mandibular reconstruction. The advantages of fibular free flap are simultaneous soft and hard tissue reconstruction and placing implant in reconstructed mandible. In this study, 14 consecutive OSCC patients who underwent fibular free flap reconstruction were reviewed in respect of function, esthetics and food intake after operation.

**Materials and methods:** Fourteen consecutive patients who underwent free fibular reconstruction between August 2007 and April 2016 were included in this study. Male to female ratio was 1:1 and average age was 62.6 years old. All patients need mandibular bone reconstruction. Thirteen patients presented OSCC from gingiva and one male patient had primary intraosseous SCC. Postoperative flap survival, functional reconstruction, esthetic results, food taking were evaluated.

**Results:** Fourteen osteocutaneous flap were used for reconstruction. Twelve fibular flaps were survived and patients were recovered without complications. Two flaps were failed; one was failed after radiotherapy and one flap was failed 3 weeks after operation. All survived patients were satisfied with the esthetic results. Two patients received dental implant therapy. Patients reported improved solid food intake after operation with partial denture or dental implant. Four patients passed away during follow-up periods because of recurrence of the OSCC.

**Conclusion:** Fibular free flap is the workhorse flap for the mandibular hard and soft tissue reconstruction, especially in orocutaneous OSCC patients. In this study, functional and esthetic results were successful in all patients. Normal diet was possible with partial dentures or dental implant therapy



6-C-2

## A case of acute necrotizing fasciitis following internal jugular vein thrombophlebitis : Lemierre syndrome

Hyun-Jun Kim\*, MS Kim, GT Kim, TS Yoon, HG Lee, HK Lim, ES Lee, HS jang

*Department of oral and Maxillofacial Surgery, Korea University*

Lemierre syndrome is caused by preceded oropharyngeal infection and characterized by internal jugular vein thrombophlebitis. Frequently this syndrome involves metastatic infection like peritoneum, muscles, spleen. The most common etiologic organism is *Fusobacterium necrophorum*.

In this case, masticatory space abscess which is originated from tooth caused internal jugular vein thrombophlebitis. The patient had hypertension, diabetes mellitus, hyperlipidemia, Parkinson's disease. Blood culture revealed *Streptococcus sanguinis* and the patient got antibiotics which was high sensitive to those bacterium. And anticoagulant was used also.

As widespread use of antibiotics, Lemierre syndrome becomes unusual and fatality of this disease become noticeably decreased. This leads Lemierre syndrome to be forgotten by the public. However, still this syndrome is potentially fatal if early diagnosis and appropriate antibiotics treatment ia not followed.

6-C-3

## Incidence of MRONJ in patients administered bisphosphonates and antiresorptive drugs

Jungwon Cho<sup>1\*</sup>, JY Kim<sup>2</sup>, HY Kim<sup>1</sup>, TW Sung<sup>1</sup>, JB Lee<sup>1</sup>, JE Yoon<sup>1</sup>, JH Park<sup>1</sup>, JW Kim<sup>1</sup>, SJ Kim<sup>1</sup>

<sup>1</sup>*Department of Oral and Maxillofacial Surgery, Ewha Medical Center; Research Institute for Intractable Osteonecrosis of the Jaw, School of Medicine, Ewha Womans University, Seoul, Korea*

<sup>2</sup>*Clinical Oral Health Science, Graduate School of Clinical Dentistry, Ewha Womans University, Seoul, Korea*

**Purpose:** The objective of this study was to analyze the prescriptions of patients' who took medicine for osteonecrosis of the jaw, and to evaluate the risk factors associated with MRONJ occurrence. The incidence of MRONJ was also investigated and served as basic education data for awareness of MRONJ risk factors and prevention.

**Patients and methods:** The study evaluated 7,058 patients who used drugs that could increase the risk of MRONJ, based on their medical records in Ewha Womans University Mokdong Hospital, between January 1st 2003 and February 29th 2016. The risk factor data were classified according to patients' demographic characteristics, administrated drug, and the MRONJ-inducing property of the drug. The following results were acquired by analyzing the risk factors of MRONJ on the basis of the incidence rate of MRONJ, survival analysis data, and weight dose deposited of bisphosphonates.

**Results:** The average age of patients with MRONJ was 71.1 years. The incidence of MRONJ in patients aged  $\geq 70$  years was not statistically different from that in patients aged  $< 70$  years, and the age did not affect the incidence significantly. In patients administered bisphosphonates, the incidence rate of MRONJ was 3.26 per 1,000 patient-years. The incidence rate of MRONJ was 2.52 per 1,000 patient-years for patients exposed to oral bisphosphonates, and 4.03 for patients using intravenous bisphosphonates. The risk of MRONJ occurrence between patient group with  $\geq 3$  years of bisphosphonate exposure and patient group with  $< 3$

years of drug exposure was not statistically different. Risk of MRONJ occurrence associated with weight dose deposited of bisphosphonates was statistically significant for pamidronate ( $p=.045$ ) and zoledronate ( $p=.001$ ). In addition, the weight dose deposited for patients with MRONJ was statistically higher than for others.

**6-C-4****A Case analysis and literature review about the effect of long-term steroid use on MRONJ onset**

Na-rae Choi\*, Sang-Hun Shin, Hyo-Geon Kim,  
Jae-Min Song, Jae-Yeol Lee, Dea-Seok Hwang,  
Young-Deok Kim, Uk-Kyu Kim

*Dept. of Oral and Maxillofacial Surgery,  
School of Dentistry, Pusan National University*

Long-term use of steroid causes osteonecrosis of knee joint and hip joint. The necrosis of upper and lower limb has a relation with the term and dose of using steroid. The mechanism would be overgrowth of fat cell which blocks the blood flow of bone. There is a research that covers this mechanism have found that using anti-vasospasm agent could prevent osteonecrosis caused by steroids.

According to position paper from AAOMS, 2014, BRONJ is caused by agents which blocks bone resorption or angiogenesis. Steroid like referred before, brings the rise of lipocyte level in bone marrow, end up with the lowering of blood flow in bone. Also steroid inhibits angiogenesis affecting genomic expression with intracellular signal pathway.

This research based on referred paper, have investigated mandibular osteomyelitis patients who had excisional surgery from PNUDH especially those who have history of using steroid. From this group we are trying to study the correlation of the period of steroid use with occurrence of osteonecrosis, probable location, prognosis after excisional therapy, other factors. And going to discuss the paper about this

**6-C-5**

## **Transoral approach – Push through operation**

JeongWon Huh, Jung-Hwan Lim, Hyung Jun Kim

*OMFS, Yonsei University Dental Hospital*

The surgical approach of tumors on the floor of the mouth or neck can be considered both intra orally and extra orally. The approach is primarily determined by the location of the mass, however, depending on the size of the mass, can be modified in other forms. Intra oral approach has an advantage of avoidance of an external scar and injury to marginal branch of the facial nerve and hypoglossal nerve. In this presentation, we report on cases of 2 dermoid cysts and 1 sialolithiasis, in which new intra oral surgical approach – tranoral approach was performed successfully. Push through operation was named in getting the idea of pushing the mouth floor and tumor enucleations were performed effectively with this technique.