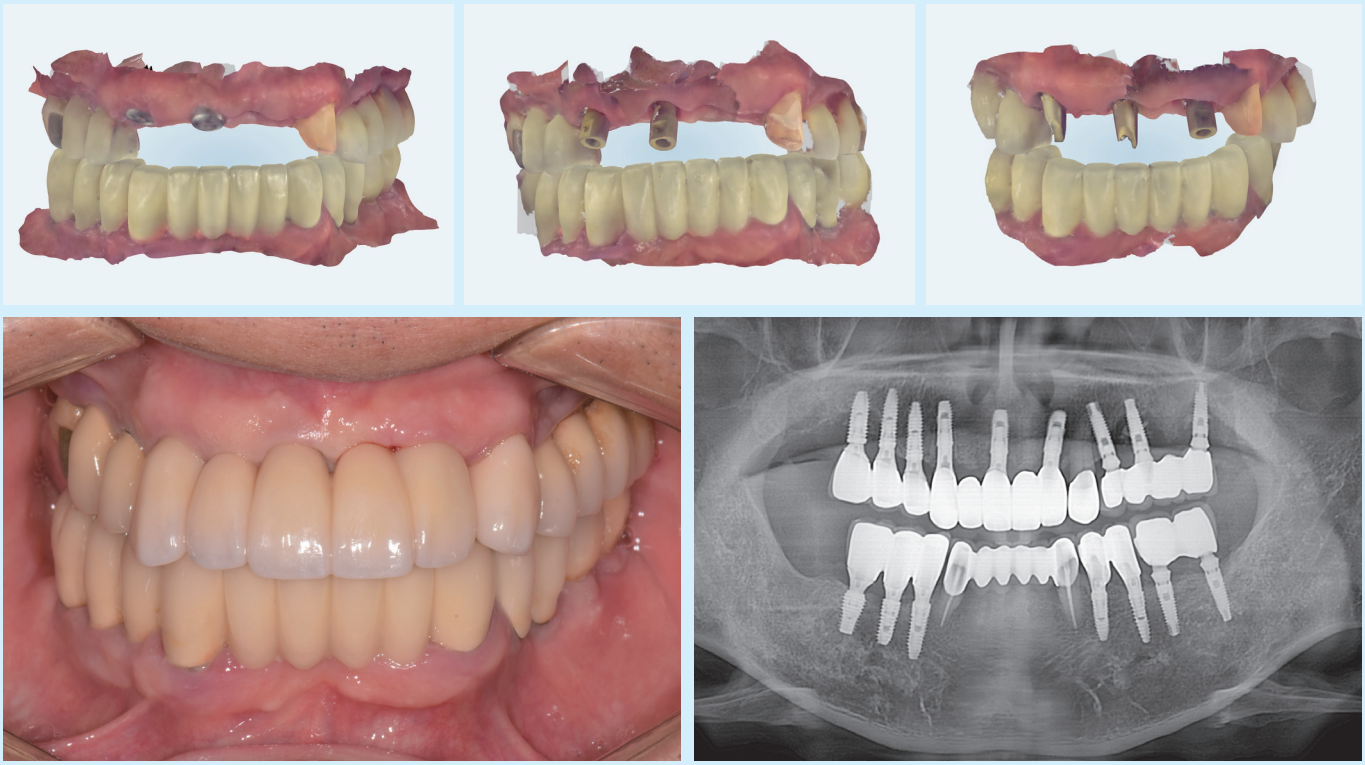
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Vol.5. December. 2023

JCDD

Journal of Clinical & Digital Dentistry



Cover Images from Wongun Chang. (J Clin Digit Dent 2023;5(4):13-18)



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About the Journal

The Journal of Clinical and Digital Dentistry are published four times (March, June, September, and December) annually since May 2019. The abbreviated title is "J Clin Digit Dent". In the journal, articles concerning any kind of clinical dentistry such as prosthodontics, orthodontics, periodontics, implant dentistry and digital dentistry are discussed and presented.

Aims and scope

This journal aims to convey scientific and clinical progress in the field of any kind of clinical and digital dentistry.

This journal publishes

- Original research data and high scientific merit in the field of clinical and digital dentistry.
- Review articles.
- Case reports in implant dentistry including GBR, digital dentistry, 3D printing, and prosthodontics.
- Short communications if they provide or document new technique and clinical tips.

About the Journal

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Editorial

Wishing everyone a happy, and healthy new year

Currently, we are preparing to welcome 2024, as 2023 has passed. As we remember this year, many thoughts will pass by. Economically, 2023 was a difficult year worldwide; hence, there were many difficult times, but still many things to be grateful.

I believe 2024 will be a year full of gratitude and happiness, where what was lacking this year will be filled several times over.

As digital dentistry has developed in various fields, I believe that many aspects have currently been clinically proven. Therefore, it is expected that 2024 will earnestly begin the major expansion of intra-oral scanners, CAD software, milling machines, and 3D printers. Particularly, as intra-oral scanners spread, it is expected that digital dentistry will develop globally and more diverse clinical know-how will be published.

I suggest that 2024 will be the year in which we focus on studying what are lacking in the digital dentistry field. Personally, I plan to focus on studying the mechanics of clear aligner orthodontics and full process of CAD-CAM complete denture. I hope this issue of JCDD will be of some help in deciding the new year's resolution.

Happy holidays and have a great new year!



Wongun Chang, DDS MS PhD

SQ GUIDE

DENTIS Digital GUIDE System for SQ IMPLANT

Application of Irrigation

Reduce bone heating with innovative irrigation-type drill design

Fixture Placement is Possible with Only Three Drillings

Application of multi-pass drilling makes 2-point fixation possible with increased accuracy due to minimal tolerance

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Maxillary sinus and implants

Yongkwan Choi, DDS,MSD, PhD

Introduction

The term maxillary sinus can be understood by breaking down its Chinese characters "上顎洞," meaning a hole in the upper jaw. This fundamental anatomical structure is involved in the placement of implants in the maxillary posterior teeth. However, securing a clear view of the inner compartments of the maxillary sinus requires diagnostic radiology instruments, which is challenging for several dentists, particularly those performing their first implants in the maxillary molar of the maxillary sinus. Due to its complex nature, implants in the maxillary sinus have mostly been performed by dental surgeons.

However, with increase in access to clinical and academic information and with development of various instruments and equipment for implants, dental treatments associated with the maxillary sinus have been facilitated. Therefore, in this session, we will explore the relationship between the maxillary sinus and implants from various perspectives.



Yongkwan Choi

Dr. Yongkwan Choi graduated from Dankook University School of Dentistry. He received MSD and PhD in his almamater. He completed a residency training at the Department of Oral and Maxillofacial surgery in Dankook University Dental Hospital. His clinical focus is a sinus surgery, implant surgery, and a digital dentistry nowadays. His goal is to become a good mind excellent surgeon. He practices at LA Dental Clinic, Seoul, Republic of Korea.

Function of the maxillary sinus

The human head and neck region comprises four pairs of sinuses: frontal, ethmoid, sphenoid, and maxillary sinuses, each named after the bone in which it is located. Among these, the maxillary sinus is the largest, with an average volume of approximately 15 cc, located upward adjacent to the orbit and downward adjacent to the nasal cavity. The maxillary sinus has several key functions: regulating the humidity and temperature of air inhaled through the nose, resonating the voice within the nasal cavity, and reducing the weight of the head and neck region. The most important function of the maxillary sinus is "drainage" of foreign substances from the maxillary sinus to the outside through an opening called the ostium. The interior of the maxillary sinus is lined with a mucous membrane, known as the Schneiderian membrane, composed of pseudostratified ciliated columnar epithelium with a thickness ranging from 0.3 to 0.8 mm . The ciliary movement of this mucosa facilitates the drainage of substances from the maxillary sinus through the ostium into the nasal cavity. Thus, maintaining a healthy mucosa in the maxillary sinus allows various substances, including implants, to be naturally expelled through the nose over time **(Fig. 1-3).**

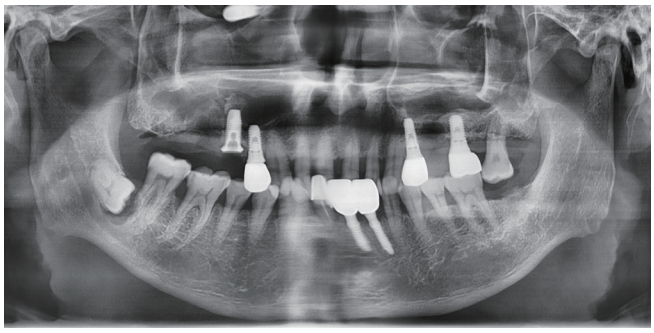


Fig. 1. Implants displaced into the maxillary sinus

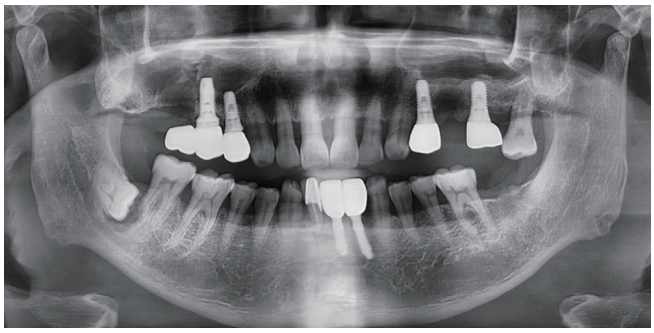


Fig. 2. The implant naturally drained out of the ostium through ciliary movement of the maxillary sinus mucosa



Fig. 3. Naturally drained out implant

Maxillary sinus floor elevation using a lateral approach

The lateral approach refers to accessing the maxillary sinus by approaching its lateral wall **(Fig. 4).** One common approach for creating an opening on the lateral wall of the maxillary sinus involves the use a straight round bur with a low-speed handpiece. In the early stages of bone removal, the cortical bone must be removed from the lateral wall. During this process, a carbide bur is employed to expedite surgery and thus reduce surgery time. Once a sufficient amount of cortical bone is removed, a diamond bur is used to minimize membrane damage **(Fig. 5).**

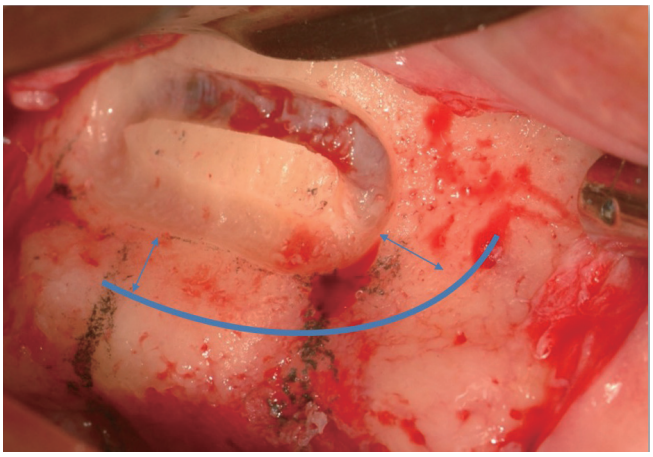


Fig. 4. An opening formed on the lateral wall of the maxillary sinus (window)

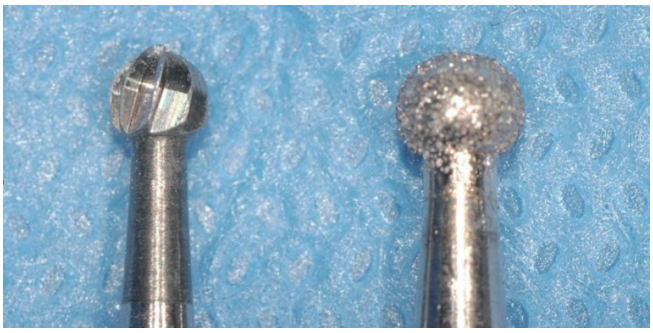


Fig. 5. Low-speed handpiece with carbide bur and diamond bur

Low-speed handpieces and round burs are used due to familiarity. However, various drill types are available to create openings on the lateral wall of the maxillary sinus while minimizing mucosal damage **(Fig. 6).**

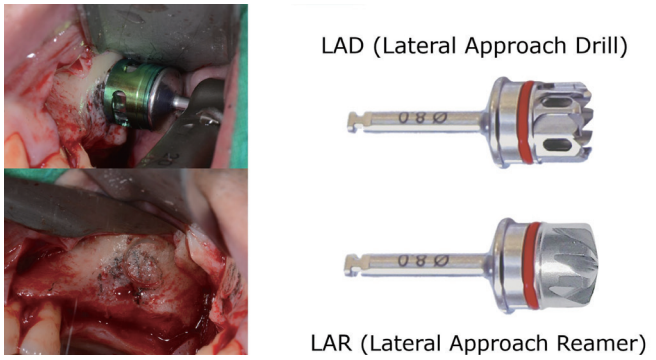


Fig. 6. . SAVE SINUS KIT drill by Dentis for creating an opening on the lateral wall of the maxillary sinus

Utilizing a specialized curette proves advantageous for elevating the maxillary sinus mucosa. However, given the diverse shapes of the maxillary sinus and dental arch in individual patients, it's crucial to have curettes of various shapes and sizes ready in advance **(Fig. 7).**

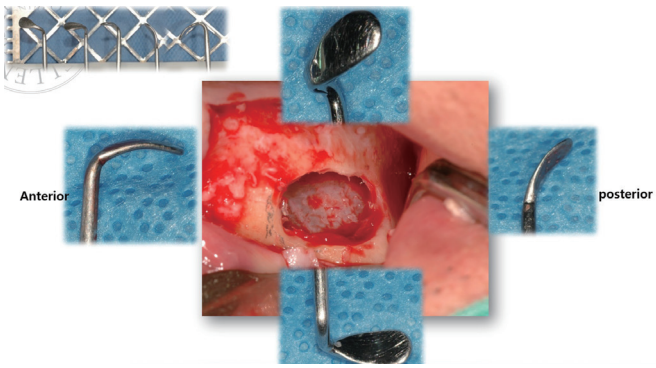


Fig. 7. Specialized curettes for elevation of various maxillary sinus mucosa types

After elevating a substantial amount of mucosa for implant placement, GBR and sutured to complete maxillary sinus floor elevation using the lateral approach. However, for simultaneous implant placement during maxillary sinus floor elevation, maxillary sinus mucosa elevation is followed by drilling to place the implants before the cortical bone graft is placed on the mesial and palatal sides of the elevated maxillary sinus mucosa. To complete the procedure, implants are placed, and GBR on the remaining areas.

Maxillary sinus floor elevation with a crestal approach

Since Summers first reported bone-added osteotome sinus floor elevation (BAOSFE) in 1994, currently known as maxillary sinus floor elevation with a crestal approach, BAOSFE has become a popular procedure performed by many dentists **(Fig. 8).**

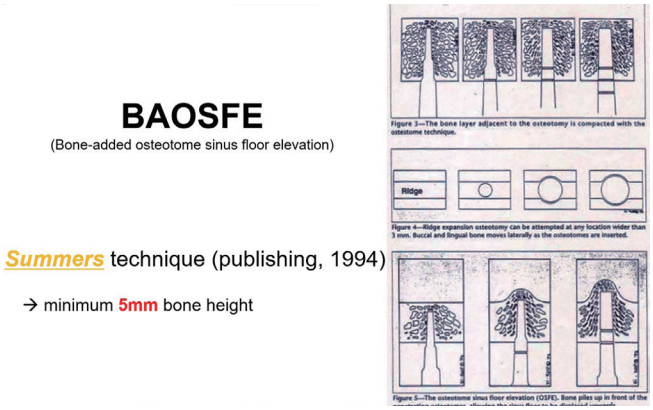


Fig. 8. BAOSFE (bone-added osteotome sinus floor elevation)

The mechanical impact of utilizing a mallet on the osteotome during the BAOSFE procedure can exert excessive vertical pressure on the maxillary sinus mucosa, potentially resulting in damage and the onset of benign paroxysmal positional vertigo (BPPV). Consequently, the use of BAOSFE has gradually diminished due to these undesirable effects. Subsequent procedural refinements have focused on elevating the maxillary sinus membrane while mitigating mucosal damage through the crestal approach, employing instruments such as a reamer or diamond drill. Noteworthy advancements in surgical instrumentation have further facilitated these techniques **(Fig. 9).**

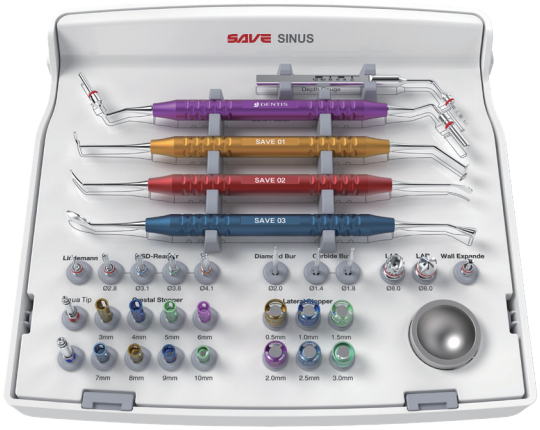


Fig. 9. SAVE SINUS KIT by Dentis for easier maxillary sinus floor elevation

Utilizing a reamer or diamond drill, the perforation of the cortical bone at the inferior boundary of the maxillary sinus minimizes mucosal damage. Employing this technique, the bone compaction and spreading method indirectly elevates the maxillary sinus mucosa by executing bone grafting between the maxillary sinus mucosa and its lower boundary **(Fig. 10).**

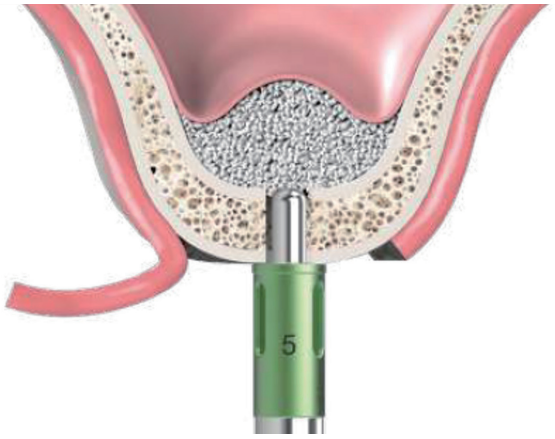


Fig. 10. Crestal approach for maxillary sinus floor elevation using the bone compaction and spreading technique

An alternative approach involves perforating the cortical bone at the lower boundary of the maxillary sinus with a reamer or diamond drill, employing hydraulic pressure instead of bone grafting for maxillary sinus mucosal elevation. Widely adopted, the hydraulic lift technique is employed for maxillary sinus floor elevation. The adhesive properties between the maxillary sinus mucosa and its lower boundary, as well as mucosal viscosity, vary significantly among patients. Consequently, the application of the hydraulic lift technique presents challenges in accurately predicting the required mucosal elevation when dealing with substantial amounts of sinus mucosa. Nonetheless, in comparison to BAOSFE or the bone compaction and spreading technique, the hydraulic lift method exhibits the lowest risk of maxillary sinus mucosal perforation.

Initially, when introduced by Summers, BAOSFE recommended the crestal approach for distances exceeding the height of the remaining cortical bone ridge (5 mm) from the crestal bone to the lower boundary of the maxillary sinus. If the distance fell below 5 mm, Summers advocated for a transcrestal approach. However, in clinical decision-making between these approaches, various factors, in addition to the height of the remaining cortical bone ridge, must be considered. **(Fig. 11)**

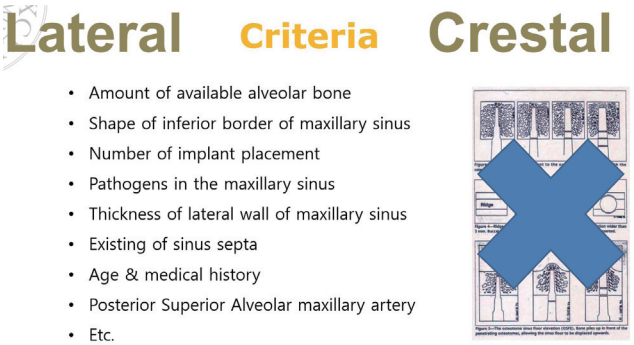


Fig. 11. Various criteria for determining crestal and transcretal approaches

Bone grafts used in maxillary sinus floor elevation

Numerous previous studies consistently demonstrate a high success rate for maxillary sinus floor elevation, irrespective of the type of bone graft employed. The simultaneous implantation following maxillary sinus mucosa elevation not only prevents implant repositioning but also supports osteogenesis. Recent investigations indicate successful cases conducted without the use of bone grafts. The space formed post-maxillary sinus mucosa elevation represents a self-contained defect conducive to the regeneration of the implanted bone grafts. Consequently, the specific type of bone graft utilized is not a critical determinant of the success of maxillary sinus floor elevation. Notably, the choice of synthetic or xenogeneic bone is associated with lower post-surgical re-pneumatization of the maxillary sinus lower boundary, while allogeneic bone may contribute to more substantial re-pneumatization. Furthermore, in cases of observed acute or chronic maxillary sinusitis post-surgery, xenogeneic or synthetic bone, with lower absorption volumes, may pose challenges in treating sinusitis compared to allogeneic bone. Thus, the selection of an appropriate bone graft necessitates meticulous consideration of the maxillary sinus shape and pathological changes within its compartments before surgery.

Digital guide implants and maxillary sinus floor elevation

Recent strides in digital technologies, including intraoral scanners and 3D printers, have significantly bolstered the availability of digital guide implants **(Fig. 12-17).**

[case 1]



Fig. 12. Tooth extraction socket



Fig. 13. Drilling for implant placement using a guide stent

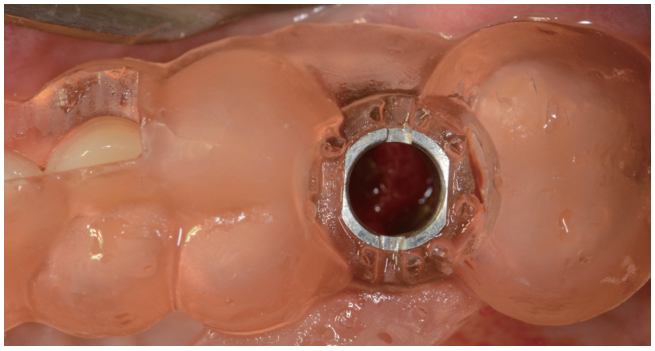


Fig. 14. Application of a guide stent for implant placement



Fig. 15. GBR for maxillary sinus floor elevation with a crestal approach

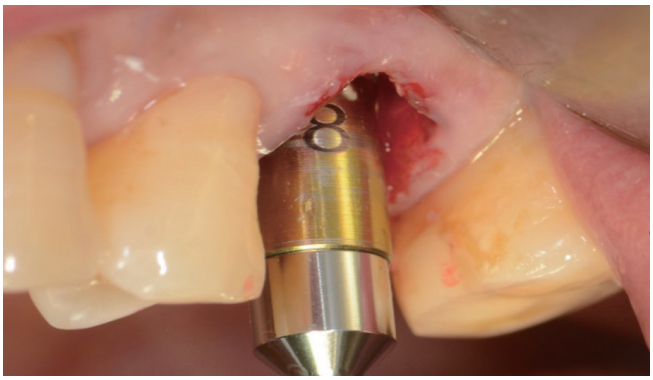


Fig. 16. Maxillary sinus mucosa elevation using a dedicated reamer in SAVE SINUS KIT by Dentis.

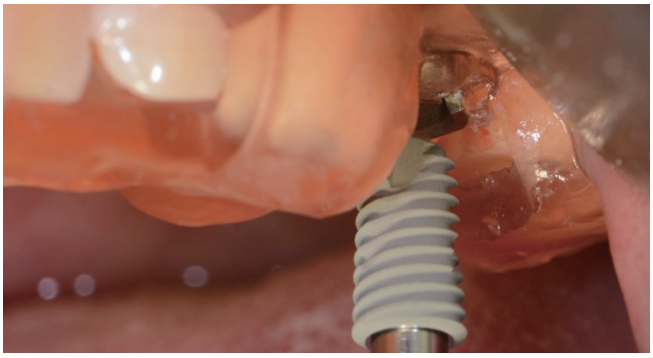


Fig. 17. Elevation of maxillary sinus mucosa, repositioning of the guide stent, and implant placement in the planned location.

As illustrated above, the simultaneous execution of maxillary sinus floor elevation and implant placement is facilitated by a digital guide system. Initially, a guide stent is employed for the initial drilling, followed by its removal for maxillary sinus floor elevation. Subsequently, the guide stent is reutilized for precise implant placement. While the repetitive attachment and removal of the guide stent may pose a level of inconvenience, the integration of a surgical kit can streamline the process, enabling concurrent maxillary sinus floor elevation and the operation of an implant placement drill on a guide stent **(Fig. 18-21).**

[case 2]

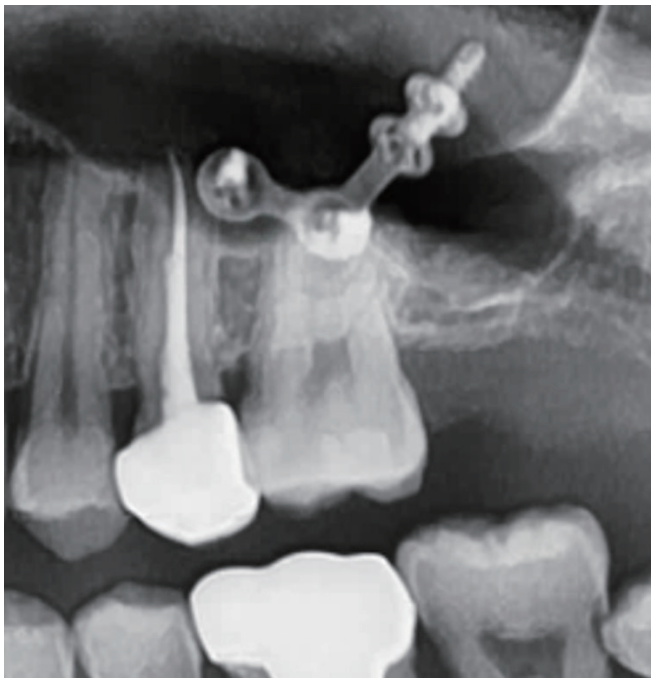


Fig. 18. Tooth loss of #27 and pneumatized maxillary sinus

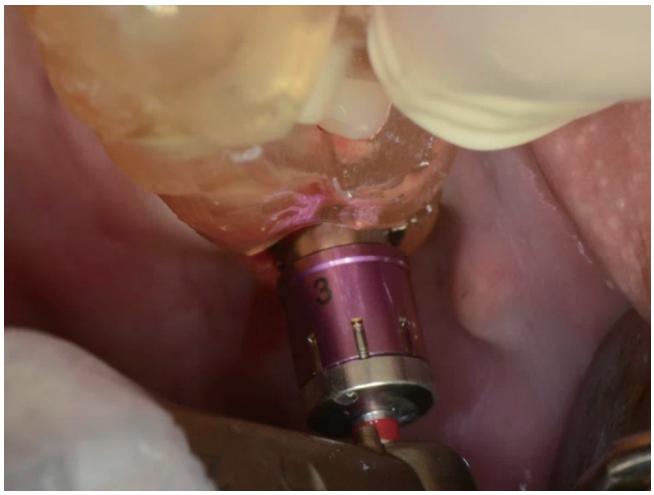


Fig. 19. Maxillary sinus floor elevation using a guide stent

For this case, the SQ SINUS GUIDE KIT by Dentis was employed, wherein maxillary sinus floor elevation with a crestal approach and implant placement were seamlessly executed without the need to remove the guide stent.

How to cite this article: Choi YK. Maxillary sinus and implants. J Clin Digit Dent. 2023;5(4):6-11. www.jcdd.org



Fig. 20. Implant placement after completion of maxillary sinus floor elevation

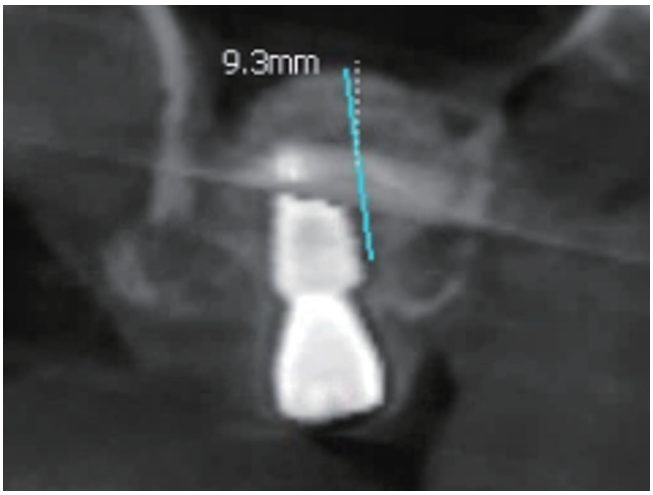


Fig. 21. Postoperative cone-beam computed tomography (CBCT) showing stable 9 mm elevation of the maxillary sinus mucosa

Conclusion

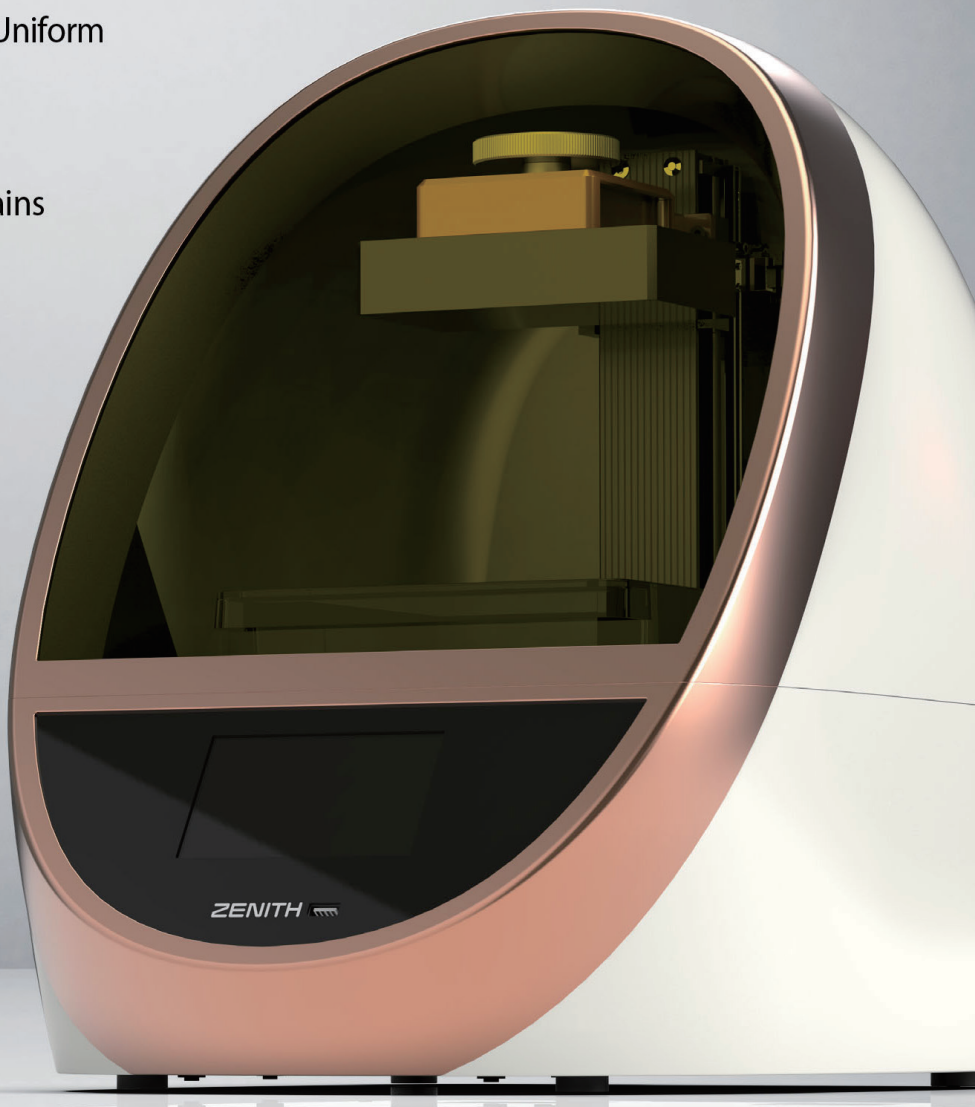
Recent trends in dentistry emphasize on enhancing the precision and convenience of procedures through digital technologies, thereby advancing the accuracy and ease of maxillary sinus surgeries. Nonetheless, obtaining a clear view of the maxillary sinus remains challenging without a lateral approach. Therefore, beyond the focus on digital technologies, dedicated efforts are essential to explore the fundamental anatomy and diverse pathological changes within the maxillary sinus.

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Transitioning to easy and accurate implant surgeries and restorations

Wongun Chang, DDS, MS, PhD

Introduction

In the past , implant surgeries and implant prosthesis were considered specialized procedures requiring specific training and expertise. Until the early 2000s, Bone graft surgery, sinus floor elevation surgery, and prosthetic restoration for multiple implants, and full mouth implant restoration posed significant challenges for general dentists. However, Recently, implant surgeries and restorations have evolved into routine treatments conducted by both general dentists and specialists. This shift is not necessarily indicative of an increased demand for implant treatment but rather reflects the development and refinement of simplified and accurate implant surgical techniques, propelled by advancements in computer-aided design and computer-aided manufacturing (CAD-CAM) technologies.

Popularization of guided implant surgery

Before using a CAD-CAM surgical guide, for a fabrication of surgical template, denture resin teeth or wax up teeth were arranged on the cast, and then fabricate of vacuum forming template to check implant position on panoramic x-ray or cone-bean CT. In implant supported Full fixed complete denture, Wax denture or complete denture were duplicated and fabricated surgical template **(Fig. 1-3).**



Wongun Chang

Dr. Wongun Chang graduated from Seoul National University College of Dentistry, and then earned MS degree from New York University College of Dentistry, PhD degree from Dept. of Dental materials sciences, Seoul National University College of Dentistry. He completed Advanced Education Program in Prosthodontics, NYUCD. He gives lectures in various topic, especially occlusion, complete denture, and interdisciplinary dental treatment nationally and internationally. His books 'The answer is COVAN, Harmonized stomatognathic system', and 'Functional occlusal harmony in orthodontics' are best seller in Korea from 2019. He is a president of Korean Academy of Esthetic Dentistry and a vice president of Asian Academy of Aesthetic Dentistry. He is an editor-in-chief of JCDD and a head coach of Team CTS. He maintains a private practice in Milestones Dental Institute, Seoul, Korea.



Fig. 1. A stone cast was employed to determine the implant position. Using the implant position as a reference, the surgical site was determined with omnivac, and a surgical template was fabricated.



Fig. 2.



Fig. 3.

Fig. 2-3. For full mouth implant restoration, the existing complete denture was replicated, and the implant placement site was determined using a gutta-percha cone. The surgery was performed after confirming the radiographs.

With the advent of CAD-CAM technology, it has become feasible to meticulously determine the final implant position in a top-down approach. This innovative capability empowers dentists to predict and simulate the need for a GBR in specific area and a required surgical technique, there by enhancing the predictability of the whole treatment procedures.

Currently, I fabricate a CAD-CAM surgical guide in nearly every implant surgery. These surgical guides not only aid in the surgical procedure but also provide foresight into the final restorations alongside implant placement. Pre-surgery simulations significantly reduce the actual surgery time, with the added benefit of enabling potential flapless surgeries that minimize postoperative discomfort.

To fabricate a CAD-CAM surgical guide, cone beam CT imaging and intraoral scanners are employed **(Fig. 4)**, and a guide-designing softwares are used **(Fig. 5)**



Fig. 4.

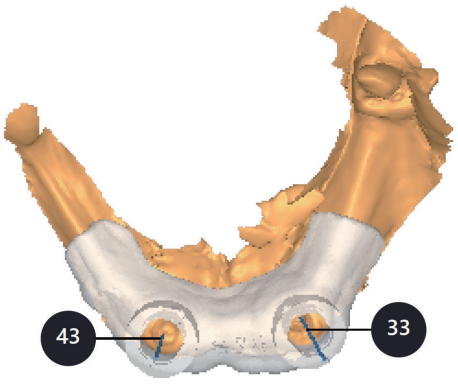


Fig. 5. Implant surgical guide design using a guide-designing software.

Subsequently, the designed guide is precision-printed using a 3D printer in office or dental lab **(Fig. 6-7)**, Facilitating immediate use in implant surgeries **(Fig. 8).**The guided implant surgery are conduted by the DENTIS SQ GUIDE System **(Fig. 9).** Dentis SQ guide system can be available all kinds of implant fixtures. In case of placing other implant fixutures, Final dedicated implant drill is utilized in the final drill step, and I have encountered no inconveniences with the SQ GUIDE System **(Fig. 10).**



Fig. 6. Zenith D 3D printer by DENTIS (DLP 3D Printer)

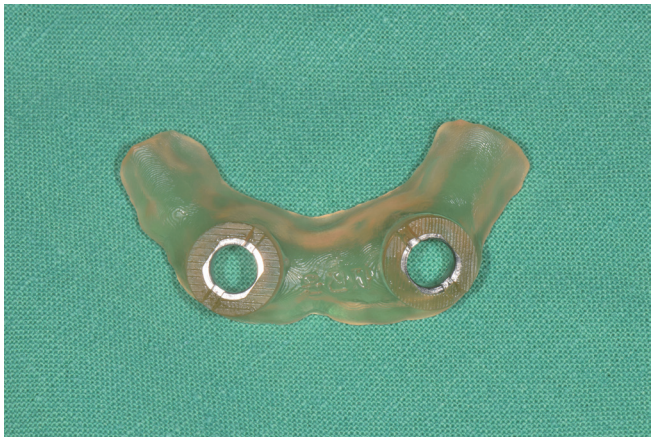


Fig. 7. The final surgical guide printed with a metal sleeve applied



Fig. 8. Try in implant surgical guide before surgery



Fig. 9. SQ GUIDE System by Dentis

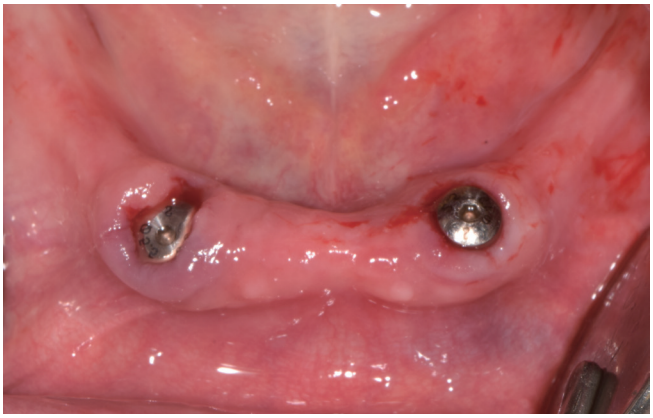


Fig. 10. The post-surgery status using the DENTIS SQ Guide System. The patient underwent implant surgery using OneQ Implants by Dentis, with the final drill of the OneQ Implant customized to the specific bone density.

Since the final location of implant placement must be determined by the dentist, it is recommended that the dentist make the final decision on the location when designing the surgical guide. In all cases, I decide where to place the implant fixture considering the surgical method, etc.

Fabrication of implant restorations with CAD-CAM

The integration of CAD-CAM technology has significantly simplified prosthetic procedures following implant surgeries, ensuring minimal alterations in shape from post-surgery to the final restoration and concurrently reducing patient discomfort. This innovation provides dual benefits by addressing both functional and aesthetic concerns through the early application of provisional restorations, commencing as early as the first day of tooth extraction and surgery. While posterior teeth may not undergo immediate provisionalization, all anterior teeth are consistently treated with provisional restorations, as seen in the following case.

A mid-60s male patient presented to my dental clinic with complaints of severe caries affecting the bridge of the maxillary anterior teeth, resulting in pain and significant movement of the bridge. **(Fig. 11-12).**



Fig. 11. Intra-oral photo before treatment. The patient has previously undergone full-mouth restoration, and currently experiences pain and movement within the maxillary anterior bridge due to decays underneath crowns

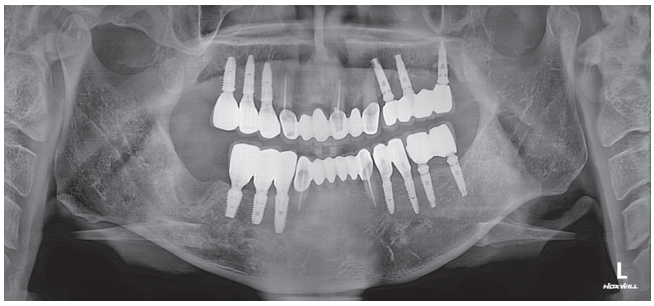


Fig. 12. Panoramic radiographs before treatment.

The patient had previously undergone a full mouth rehabilitation. There were with no issues noted in the treatment implants and mandibular anterior teeth bridges, except for per-implantitis on upper left posterior implants bridge and decays on maxillary anterior teeth as described earlier. Following discussions, I decided extraction of #12 and #21 and Implant FPD on #12-22 and single crown on #23.

Cone beam CT and intra-oral scan files were used to determine the implant placement sites, and guides and provisional teeth were fabricated **(Fig. 13).** Following an assessment of the the alveolar bone housing, implant placement was planned for sites #11, #13, and #22. Surgical implant guides and a Zenith D 3D printer were used to print provisional restorations.

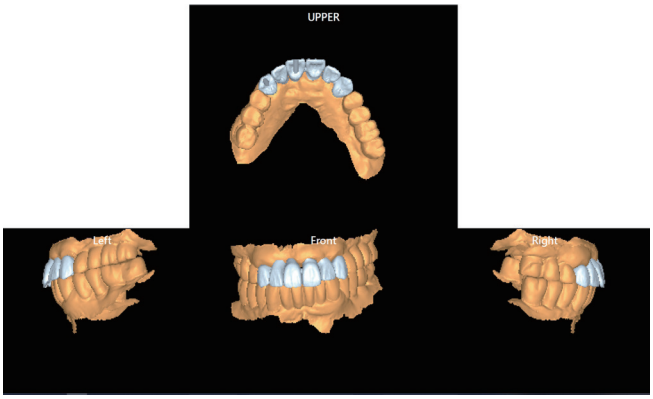


Fig. 13. Provisional restorations designed while designing the surgical implant guide

Using the DENTIS SQ Surgical Guide System, implant surgery was performed immediately after extraction. GBR was performed using a bovine xenograft materials(Ovis xeno B) at site #22, where the cortical bone was narrow **(Fig. 14).**

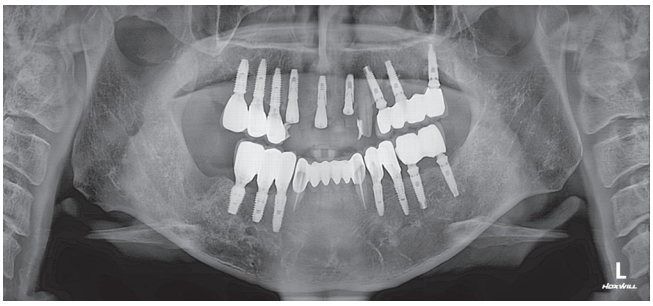


Fig. 14. Panoramic radiographs after implant surgery using the DENTIS SQ Guide System

GBR was planned, so immediate loading was not performed. Therefore, when designing the provisional restorations, both the #23 abutment tooth and the Maryland-type etched bonded bridge were simultaneously designed. Fig 15 shows a provisional restorations on an implant surgical area **(Fig. 15).**



Fig. 15. Provsional restorations which were preinted suing Zenith D 3D printer were boned on #14, and #23.

After three months, an intra-oral scan was performed using a scanbody to fabricate provisional restorations with implant fixtures **(Fig. 16-17).** In this case, OneQ Implant by Dentis was used. However, this implant has the same connection as SQ implants allowing for the use of and SQ scanbody.

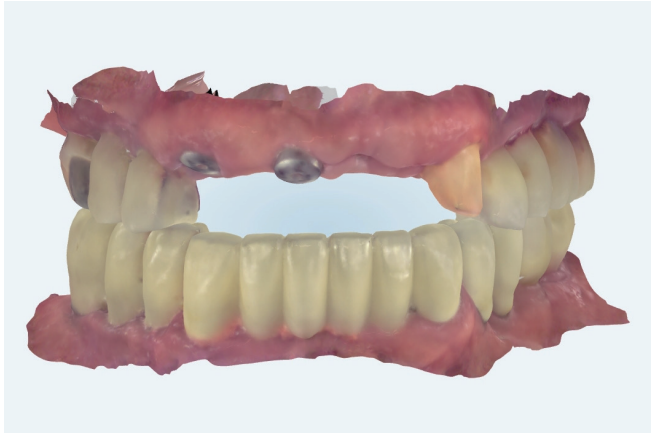


Fig. 16. Intra-oral scan was condcuted three months after surgery



Fig. 17. Scan files obtained using the SQ Scanbody, allowing model-less fabrication of custom abutments and provisional bridges.

Using the SQ Scanbody, custom abutments, and provisional bridges were fabricated and restored with temporary adhesives in the oral cavity **(Fig. 18).**



Fig. 18. Provisional bridges set in place.

4 months after implant surgery, second stage surgery was performed for #22 and subsequent intra-oral scan was performed using the SQ Scanbody, which prepares new provisional restorations **(Fig. 19).**



Fig. 19. Intraoral scan for fabrication of tooth #22 implant abutment and provisional restorations

The provisional restoration process involves connecting with custom abutments on implants **(Fig. 20).** These provisional restorations serve for evaluating the patient's functional occlsuion, tooth shape, etc. In the present case, assessing induction during mandibular movement and determining the optimal tooth color and shape. The patient expressed high satisfaction with the provisional restorations after four weeks of use. Importantly, the transition to fabricating the definitive zirconia FPD did not necessitate additional impressions or intra-oral scans.

This provisional restorations were duplicated to fabricate #13-22 ISFPD and #23 single crowns. If extensive modifications are needed for the provisional restorations, the modifed 2nd provisional restorations can be used. for oral scanning. Subsequently, the scan file of the abutment can be overlapped to determine the shape of the definitive PFD and crown.



Fig. 20. Intra-oral photo with provisional restorations. This provisional restorations enables modification and evaluation of the functional and aesthetic aspects of the restorations, and in ture, the fabrication of the definitive restoration.

The zirconia FPD and crown on #23 were fabricated and set in place **(Fig. 21-22).** Remarkably, each step of the procedure, from surgery to the final restoration, was performed on a model-less procedures.



Fig. 21. The final zirconia FPD and #23 single zirconia crown. As the provisional restorations were reproduced, the final restoration was fabricated without additional impressions or oral scans.

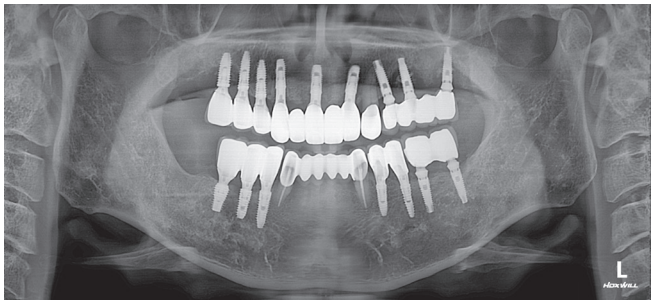


Fig. 22. Panoramic radiographs after treatment

Conclusion

The advent of CAD-CAM technology has significantly enhanced the convenience, accuracy, and treatment procedures of both implant surgeries and prosthetic processes. The success of guided implant surgeries hinges on the precise placement of implants, aligning with the envisioned final restoration. Therefore, the dentist plays a pivotal role in determining the optimal implant position and teeth shape for each patient. Furthermore, the proactive utilization and modification of provisional restorations contribute to minimizing occlusal adjustments and contouring of tooth shape during the fabrication of the final restoration, ensuring a predictable and successful outcom in implant restorative treatment.

How to cite this article: Chang WG. Transitioning to easy and accurate implant surgeries and restorations. J Clin Digit Dent. 2023;5(4):13-18. www.jcdd.org

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Setting the Patient's Occlusal Vertical Dimension in Full-mouth Prosthetic Treatment

Soohyun Ko, DDS, MSD

Introduction

Recently, All-on-X prosthetic treatment using multiunit abutment has become increasingly popular as an alternative to conventional implant treatments using custom abutments and crowns. In this case report, I discuss some simple ways to apply a patient's existing occlusal vertical dimension (OVD) to a full-mouth prosthesis.

Case Report

[case 1]
Use of existing residual teeth

A 77-year-old male wearing an existing denture visited my clinic because of discomfort in chewing food.**(Fig. 1)**



Fig. 1.



Soohyun Ko

Head Director, Jeju Hyungje Dental Clinic
Director, Korean Academy of Digitalized Dentistry
CADCAM Master Class Diplomate
Implant Master Class Mastership / Director of education
Monthly Dental (KJCD) 2021 speaker, Digital Dentistry writing staff



Fig. 2.

Intraoral scan using resin markers and CBCT were taken to obtain data for a more accurate diagnosis.

The patient had mesial angulation accompanied by overall anterior protrusion and posterior periodontitis, as well as overall teeth mobility; therefore a full-mouth rehabilitation was planned.**(Fig. 3-4)**

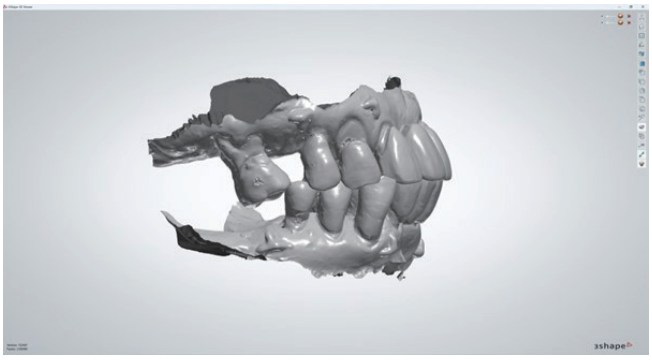


Fig. 3.

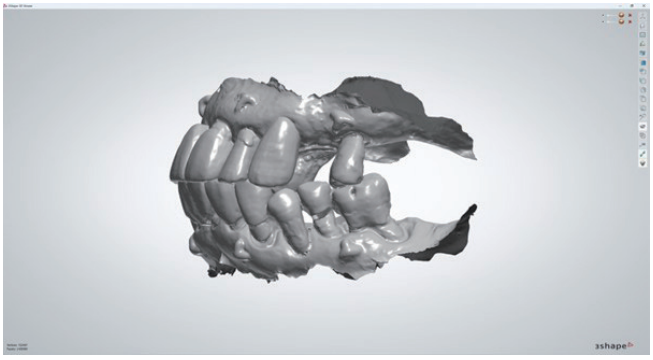


Fig. 4.

The Implant Studio enables virtual tooth extraction and diagnostic wax-up, and assists in the formulation of a treatment plan with the patient.**(Fig. 5)**



Fig. 5.

The posterior teeth could have been repaired with the existing anterior teeth preserved. However, the patient's existing prosthesis was not in good condition and it was also periodontally poor. Thus, I established a plan with the patient to proceed with All-on-Six treatment without increasing the number of implants. **(Fig. 6-7)**

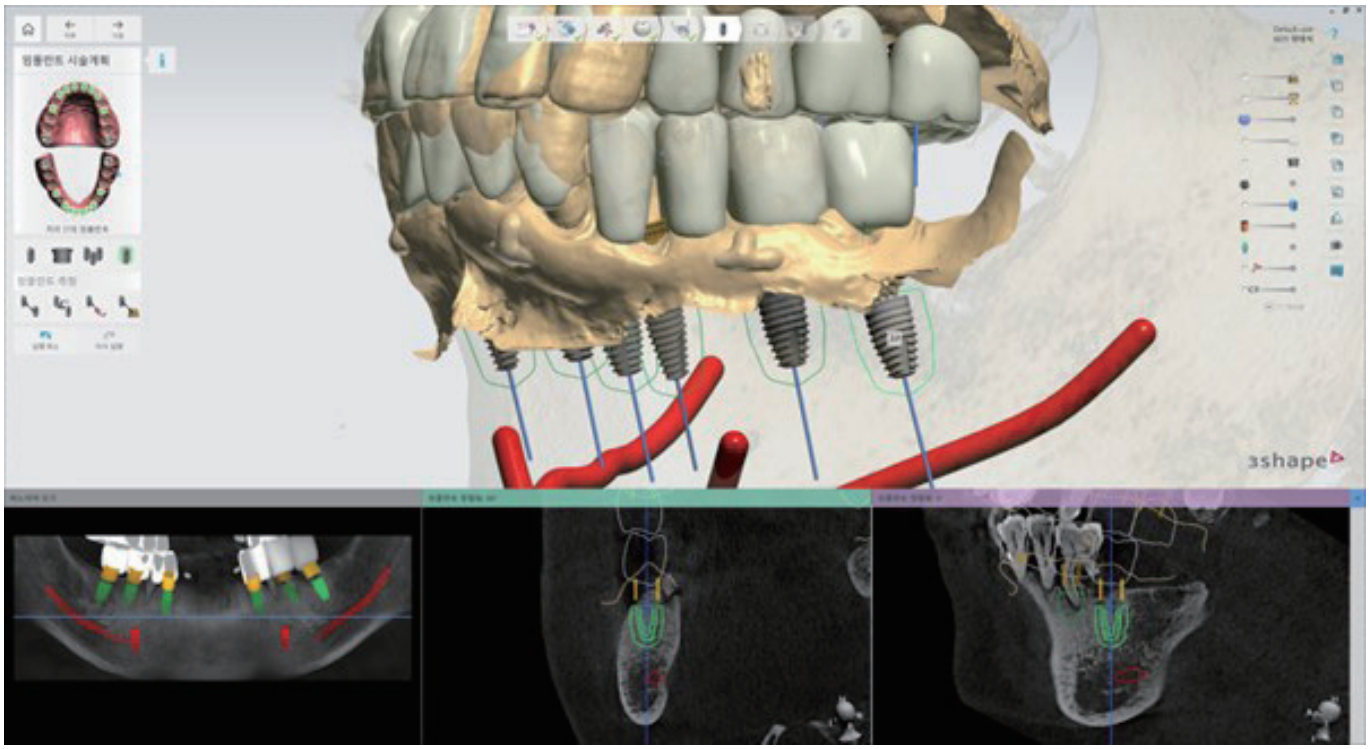


Fig. 6.

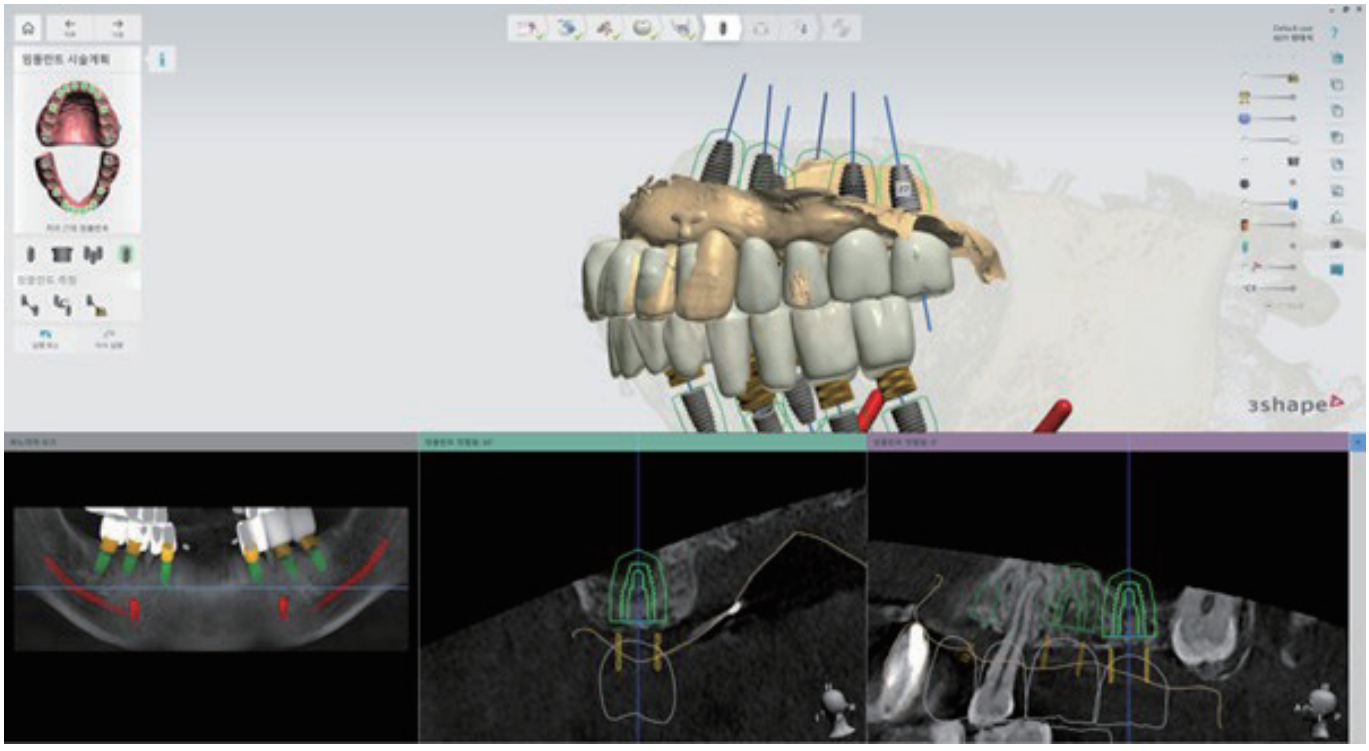


Fig. 7.

In this case, I aimed to make it easier to ensure the guide support during the operation using the patient's existing occlusal canine and to secure the post-operative occlusal VD.

I conducted a virtual tooth extraction on the CAD.**(Fig. 8-9)**

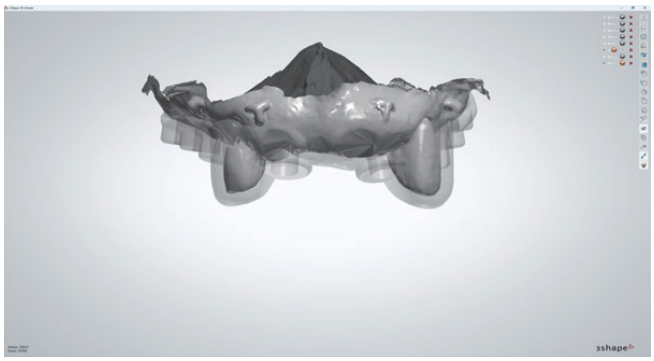


Fig. 8.



Fig. 9.

Surgical guides for the upper and lower jaw were fabricated.**(Fig. 10-11)**

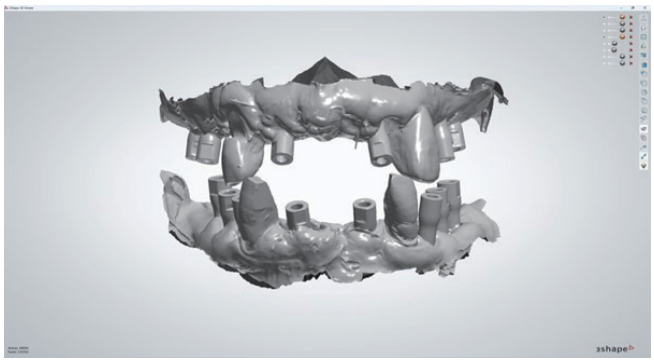


Fig. 10.



Fig. 11.

I placed the dental implants, left the canines in place, and fastened the scan body before performing an oral scan. **(Fig. 12)** Aligning the pre- and post-extraction scans allowed the patient's OVD to be formed more easily. **(Fig. 13)**



Fig. 12.

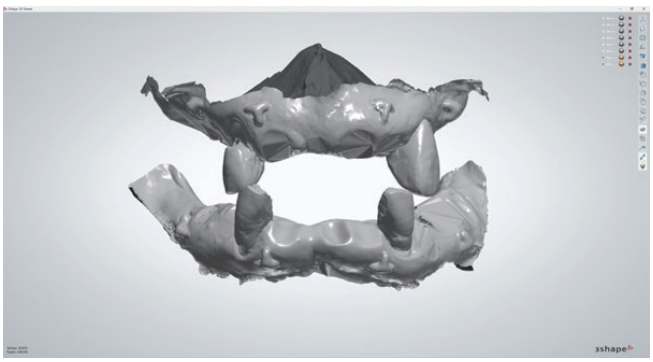


Fig. 13.

interim restorations were fabricated using a scan file for their immediate loading. In addition, it can be seen that the anterior teeth protrusion was significantly reduced. **(Fig. 14)**

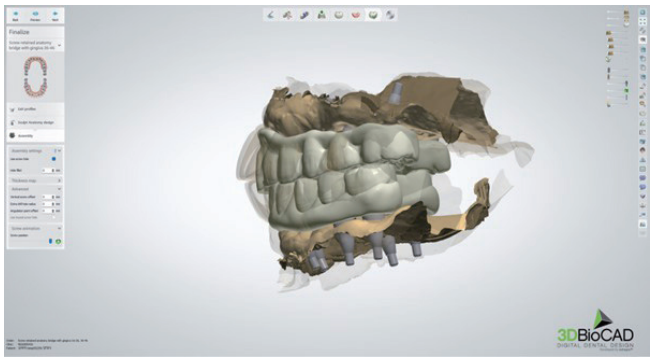


Fig. 14.

I manufactured interim restorations that did not significantly deviate from the patient's current OVD. **(Fig. 15-16)**



Fig. 15.

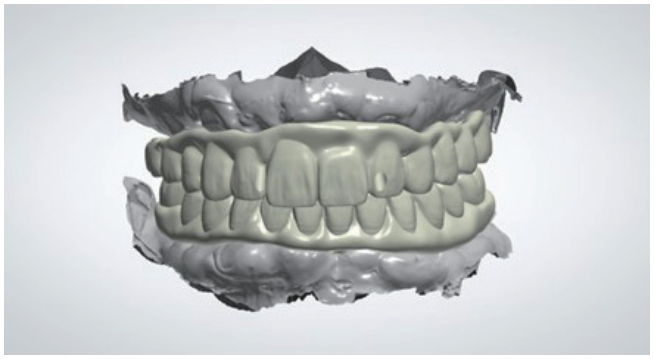


Fig. 16.

After wearing the interim restorations for about three months, the final prosthesis was delivered.**(Fig. 17-19)**

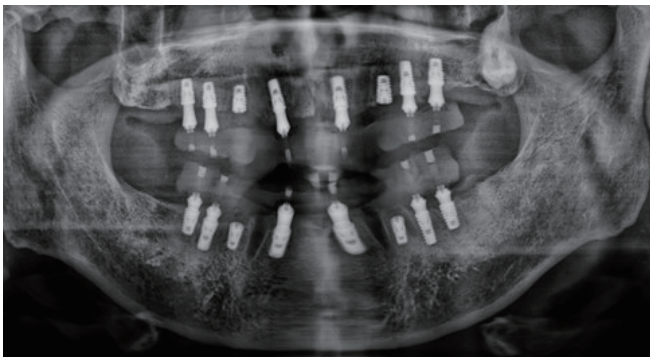


Fig. 17.



Fig. 18.



Fig. 19.

[case 2]
OVD acquisition using temporary denture

A 62-year-old female patient suffering from poor remaining teeth visited my clinic to consult with me on a treatment plan.**(Fig. 20)**

Using the Implant Studio, I established a full-mouth All-on-Six prosthetic treatment plan with the patient, which involved virtual tooth extraction and wax-up.**(Fig. 21-22)**

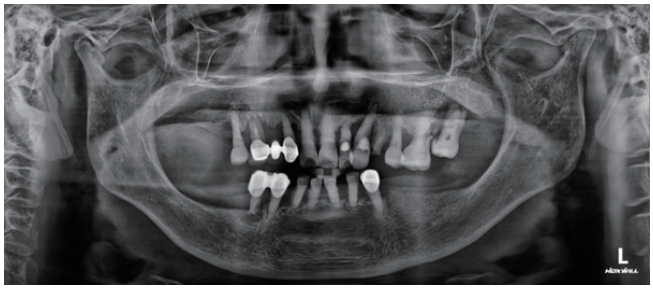


Fig. 20.

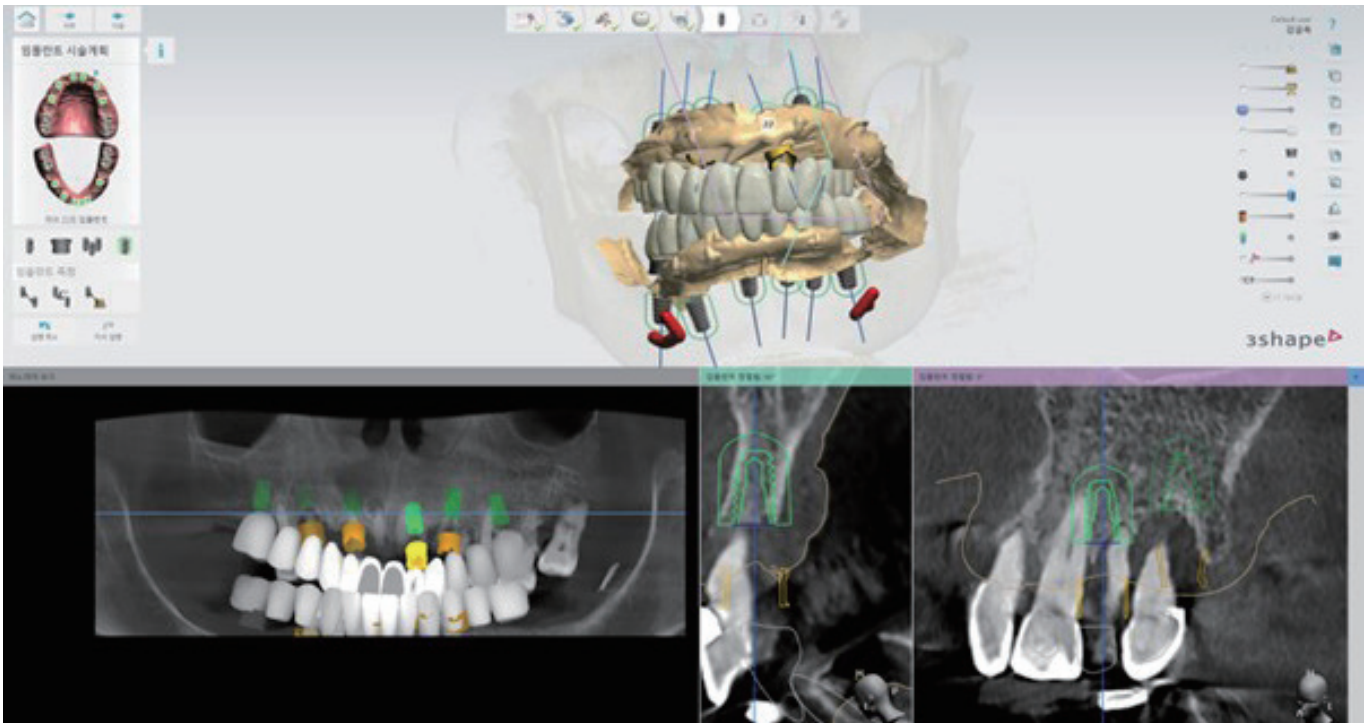


Fig. 21.

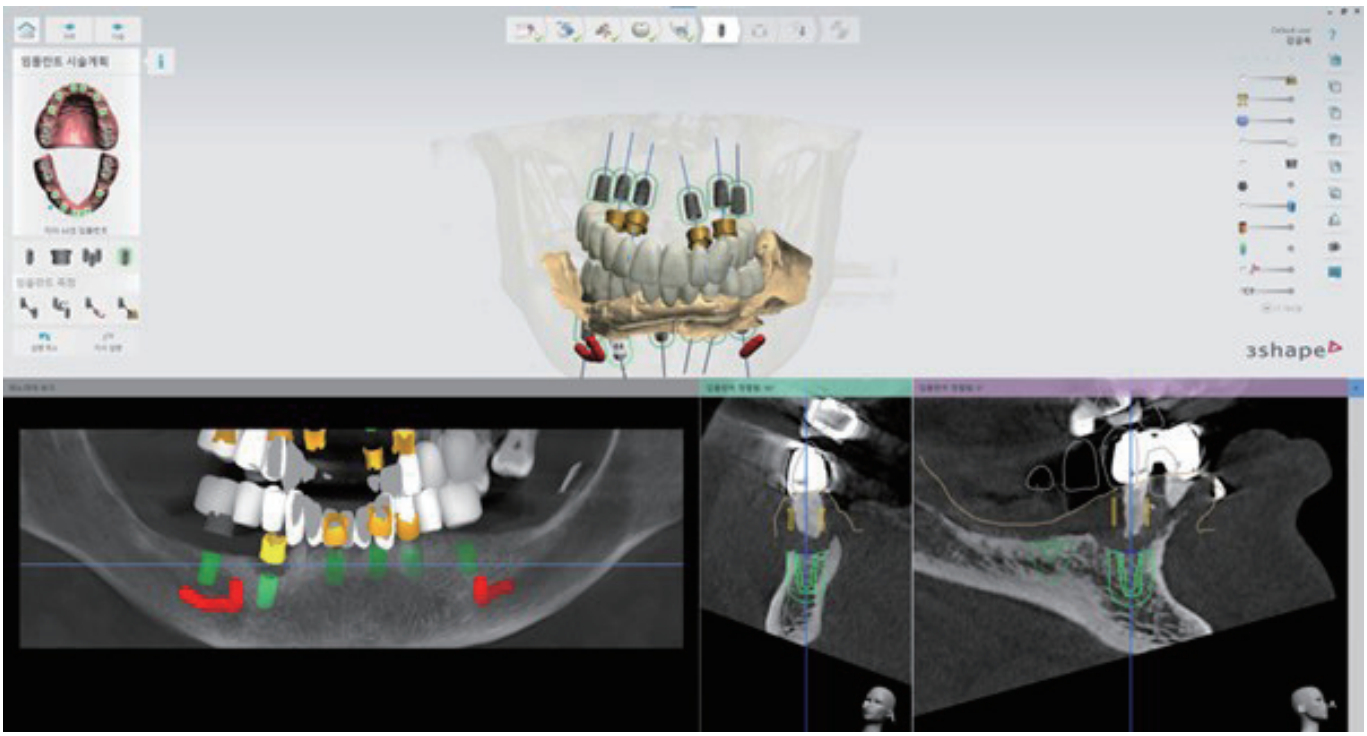


Fig. 22.

OVD acquisition

Since the existing periodontal condition was poor, the OVD could not be easily acquired. Thus, I decided to employ the temporary denture prefabricated through virtual extraction to capture the occlusal relationship via post-extraction wash-impression and then to make a surgical guide and a interim restorations. **(Fig. 23-24)**



Fig. 23.

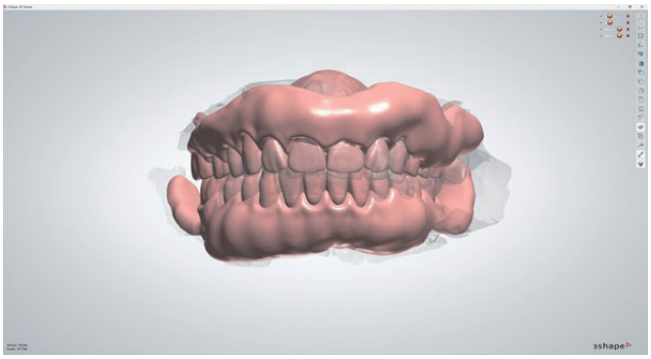


Fig. 24.

A denture was used to form the inner part of the gum after tooth extraction, and the guide was produced based on this. **(Fig. 25-28)**



Fig. 25.



Fig. 26.



Fig. 27.

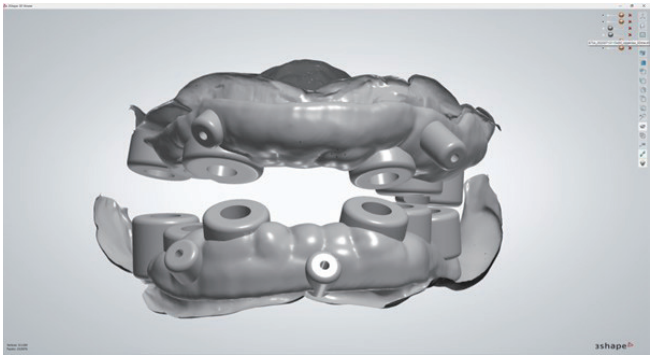


Fig. 28.

After implants placed, the scan body was fastened, followed by intraoral scan and then matching it with the existing scan to preserve the patient's OVD as in the current form. **(Fig. 29)**



Fig. 29.

The PMMA-milling interim fixed restorations were produced based on the above data. **(Fig. 31)**



Fig. 31.

Based on this, Interim fixed restorations was 3D printed. It was then loaded immediately, and the occlusal relationship was reconfirmed. **(Fig. 30)**



Fig. 30.

Three months later, the final prosthesis fabricated using zirconia milling was delivered. **(Fig. 32)**

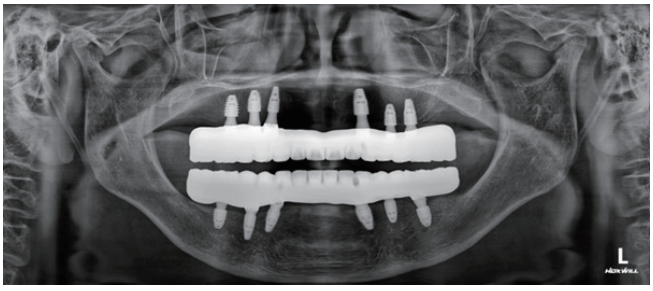


Fig. 32.

Conclusion

Maintaining the existing occlusal OVD for patients with residual teeth is satisfying for both the operator and the patient. Using digital intraoral scan data enables easy maintenance of the existing occlusal OVD and its application throughout the guide production stage until the final prosthesis.

How to cite this article: Ko SH. Setting the Patient's Occlusal Vertical Dimension in Full-mouth Prosthetic Treatment. J Clin Digit Dent. 2023;5(4):20-27. www.jcdd.org

2024. 1. 20 SATURDAY 16:30 — 21:00 PM

CLIP 2024

CLINICIAN'S PERSPECTIVE

CLIP은 매년 1월, 최근 주목할 만한 임상·연구·논문을 공유하고,
그 해의 변화와 덴탈 트렌드를 알아보는 컨퍼런스입니다.

CLIP 2024에서는 시공간의 합병증을 극복하기 위한 임상 술식에 대한 연구, 논문과 함께
술식 변화의 방향을 이해해 향후 트렌드를 예측하고, 준비하는 장이 되기를 기대하며 준비하였습니다.

KEYNOTE — 16:30 — 16:40



학술위원장
권긍록 교수
경희대치과병원 보철과

Beyond complications of Space-time : Try whatever to begin!
시공간의 합병증을 극복하기 위한 임상 연구 트렌드

SESSION 1 — Human error and complication — 16:40 — 17:40



좌장
권용대 교수
경희대치과병원 구강악안면외과



연자
박창주 교수
한양대병원치과 구강악안면외과

DINNER — 17:40 — 19:00

SESSION 2 — Surgical considerations for immediate implantation — 19:00 — 20:00



좌장
정의원 교수
연세대치과병원 치주과



연자
김성태 교수
서울대치과병원 치주과



연자
이동운 교수
원광대치과병원 치주과

SESSION 3 — 임플란트 수복의 보철적 관점에서 합병증 극복을 위한 planned approach — 20:00 — 21:00



좌장
이규복 교수
경북대치과병원 보철과



연자
정찬권 원장
정찬권에이블치과



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장 소 SKY31 (서울 송파구 올림픽로 300, 롯데월드타워 31층)

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