

2021 2nd

OSSTEM IMPLANT

CONSENSUS REPORT

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Preface

2021 2nd OSSTEM IMPLANT CONSENSUS REPORT

Meeting Schedule

Date 2021.12.12 (14:00~18:00)

Venue Conrad Hotel in Yeouido, Seoul

Schedule	Time		Agenda
Opening	11:50 ~ 13: 30	10mins	Introduction of the workshop schedule and guests Sharing the status of Edition 6 development
Session 1	14:10 ~ 15:00	50mins	Consensus 1 : Common part
Break	15:00 ~ 15:10	10mins	Break
Session 2	15:10 ~ 17:10	120mins	Consensus 2 : S / P / D Moderator (S:Director Kim Kyoung-won, P: Director Cho In-ho)
Break	17:10 ~ 17: 30	20mins	Break
Session 3	17:30 ~ 18:00	30mins	Presentation on the consensus results

Participants

Osstem Implant Chairman Choi Kyu-ok / CEO Eom Tae-kwan

Moderator: Director Cho In-ho / Director Kim Kyoung-won

Part	Director	Title	Dental Clinic Name	Part	Director	Title	Dental Clinic Name
Surgery	Kim Kyoung-won	Director	Osstem Implant	Prosthodontics	Cho In-ho	Director	Osstem Implant
	Kwon Young-sun	Director	Woori Dental Hospital		Kim Ki-seong	Director	Namsang Dental Clinic
	Kim Yong-jin	Professor	Catholic University of Korea, Daejeon st. Mary's Hospital		Kim Hak-hu	Director	Guoldam Dental Hospital
	Kim Jin	Director	Yonsei 9 Dental Clinic		Noh Kwan-tae	Professor	Kyunghee University Dental Hospital
	Kim Chin-gu	Director	Hyo Dental Clinic		Park Jong-hun	Director	Duri Dental Clinic
	Park Jeong-cheol	Professor	Hanyang University Dental Hospital		Lee Joon-seok	Professor	Dankook University Dental Hospital
	Park Chang-joo	Director	e-Good Dental Clinic		Jeon Jin	Director	Seoul Samsung Dental Clinic
	Son Young-whee	Director	Lee Dae Hee Seoul Dental Clinic		Cho Young-jin	Director	Seoul Deep-rooted Dental Clinic
	Lee Dae-hee	Director	Wonderplant Dental Clinic		Joo Hyun-cheol	Director	Seoul S dental clinic
	Lee In-woo	Director	The Wise dental Clinic		Kim Jong-eun	Professor	Yonsei University Dental Hospital
	Im Se-Ung	Director	NYPIL Dental Clinic		Kim Sung-jin	Director	Oneday Dental Clinic
	Lim Pil	Director	Neo Dental Clinic	Digital	Bae Jeong-in	Director	Seoul Gangnam Dental Clinic
	Choi Ho-cheol	Director			Shin Hyung-kyun	Director	Seoul Chung Barun Dental Clinic
					Lee Soo-young	Director	Seoul Line Dental Clinic
					Chun Sei-young	Director	Digital Hub Dental Clinic
					Hur Yin-shik	Director	Hur Yin-shik Dental Clinic

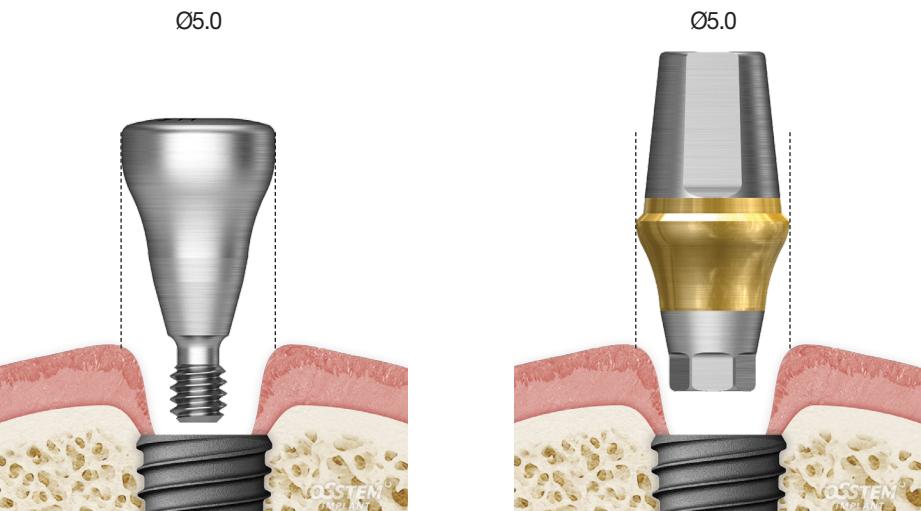
Common part

Common part Issue 1

① Is it proper to use the same diameter of healing abutment as the diameter of final abutment?

Consensus 1

- ① It is proper to use the same diameter of healing abutment and final abutment.
- In the cases where the diameter of healing abutment is smaller than the diameter of final abutment, gingival compression causes the pain to patients, so infiltration local anesthesia can be necessary. In the contrary case, healing abutment can be misconnected due to the interference of adjacent bone tissues.



Reference

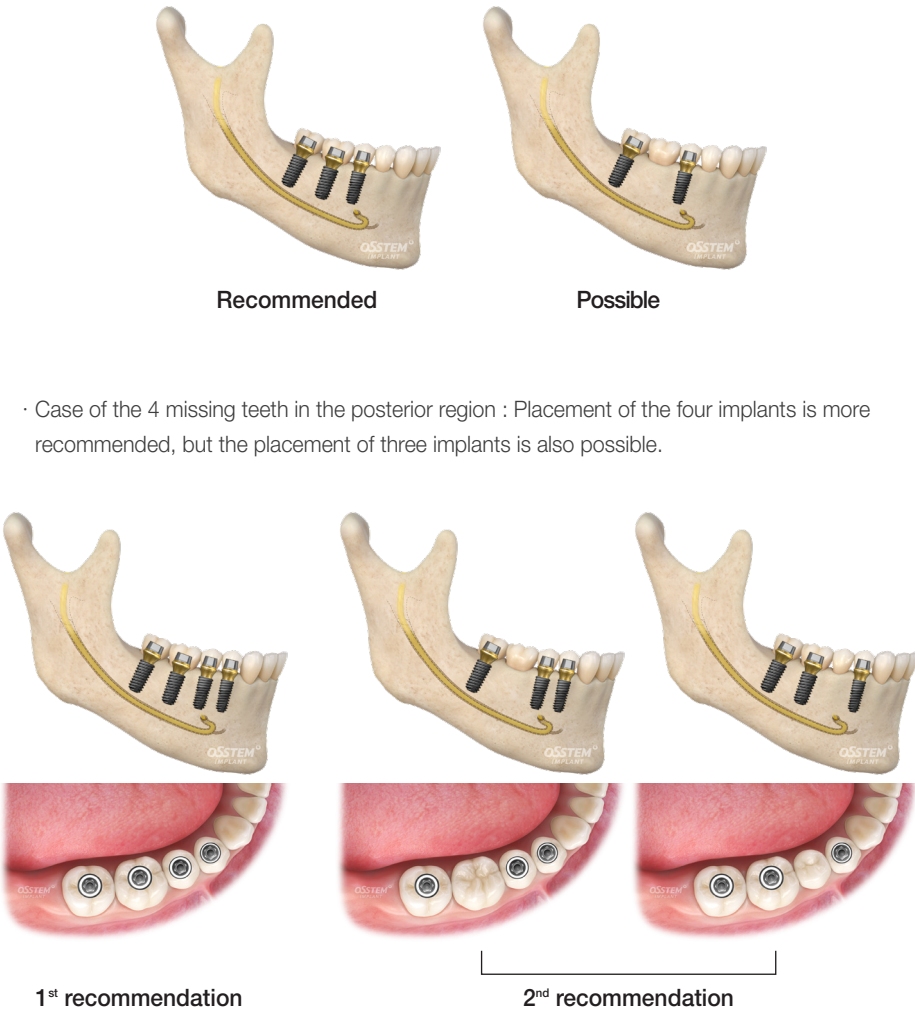
Presented by Dr. Kim Ki-seong

Issue 2

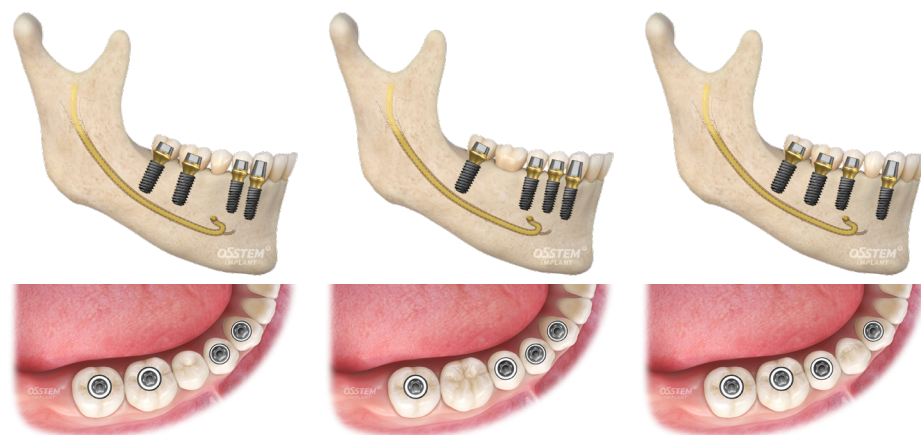
① What is the recommended number and location of implants for partial edentulous cases?

Consensus 2

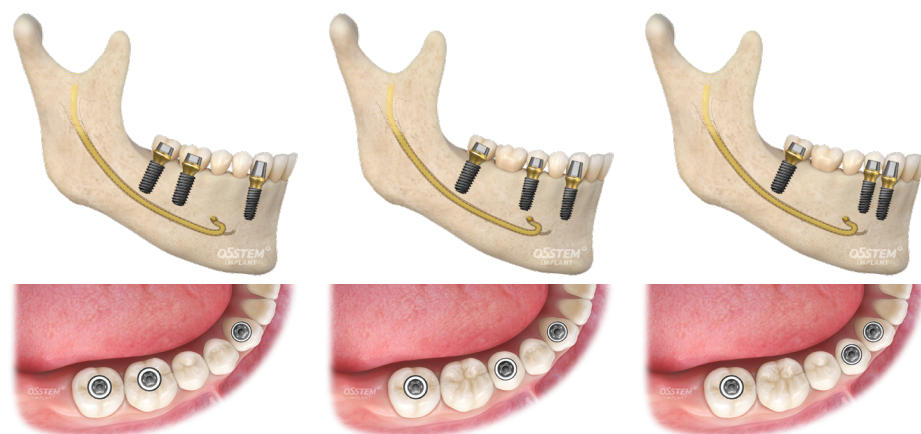
- ① The recommended number and location of implants for partially edentulous cases are as follows:
- Case of the 3 missing teeth in the posterior region : Placement of the three implants is recommended, but placement of two implants is also possible in consideration of the distance between implant and natural tooth.



· Case of 5 missing teeth (canine + posterior region) : Placement of 4 implants is more recommended, but the placement of only 3 implants is also possible.



1st recommendation



2nd recommendation

Reference

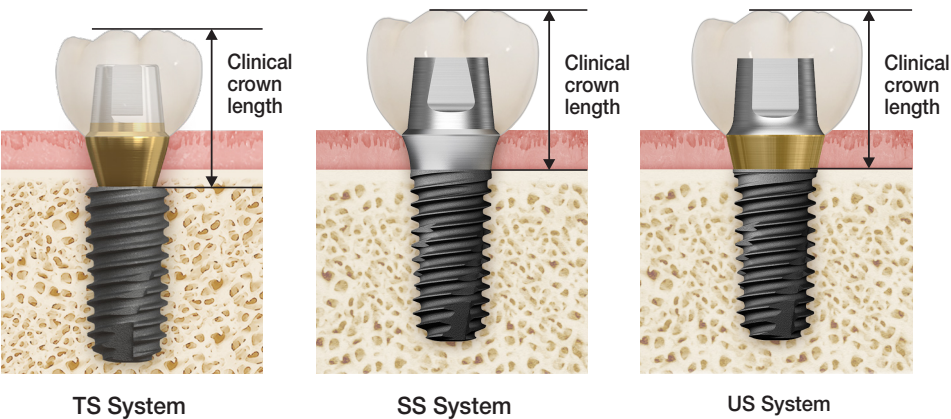
Presented by Dr. Kim Ki-seong

Issue 3

① What is the clinical crown length in implant?

Consensus 3

① In implant, clinical crown length refers to the length from the top portion of implant where the bone and implant contact to the crown tip.



Reference

Presented by Dr. Kim Ki-seong

•KJ Lee, et. al. Influence of crown-to-implant ratio on peri-implant marginal bone loss in the posterior region: a five-year retrospective study. J Periodontal Implant Sci. 2012;42:231-236

•Yiman Tang, et. al. Influence of crown-to-implant ratio and different prosthetic designs on the clinical conditions of short implants in posterior regions: A 4-year retrospective clinical and radiographic study. Clin Implant Dent Relat Res. 2020;22:119-127

Surgery part

Surgery part

Issue 1

① What is the disinfection method of OneGuide surgical template?

Consensus 1

- ① OneGuide surgical template is sterilized by EO gas or disinfected by immersing it in 70% alcohol for 15 minutes. (In case where it is applied in the oral cavity after alcohol disinfection, it is recommended to be irrigated with saline.)
- As semi-critical instrument, OneGuide surgical template must be sterilized or disinfected at a high degree.
 - Due to the material characteristics, autoclave disinfection or plasma disinfection is not recommended as it may cause deformation.



Reference

- Ministry of Health and Welfare, et. al. Dental Infection Control Standard Policy & Procedure. 2020
- Formlabs, Instructions for Use SURGICAL GUIDE RESIN, 11/12/2019 PRNT-0001, Rev: 01
- Gréta Török, et. al. Effects of disinfection and sterilization on the dimensional changes and mechanical properties of 3D printed surgical guides for implant therapy – pilot study. BMC Oral Health. (2020) 20:19
- Peter N Smith, et. al. Microbial contamination and the sterilization/disinfection of surgical guides used in the placement of endosteal implants. Int J Oral Maxillofac Implants. Mar-Apr 2011;26(2):274-81

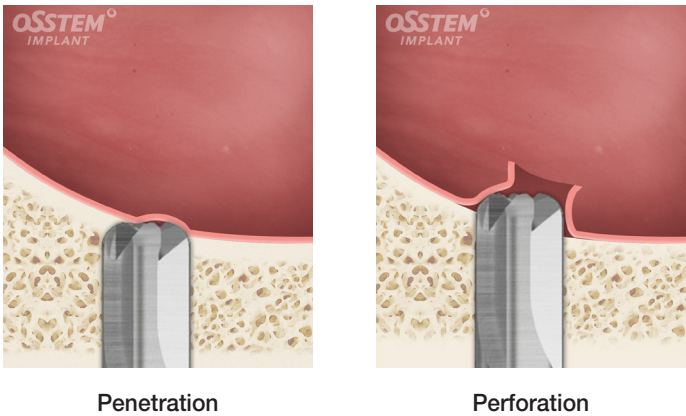
Presented by Dr. Kwon Young-sun

Issue 2

① What is the proper term for the situations in which the maxillary sinus floor is penetrated during crestal approach?

Consensus 2

- ① “Penetration” refers to the situations where the maxillary sinus floor is penetrated.
- When the maxillary sinus membrane is torn, it is called “perforation”.



Reference

- Liat Chaushu, et. al. Sinus Augmentation with Simultaneous, Non-Submerged, Implant Placement Using a Minimally Invasive Hydraulic Technique. Medicina. 2020, 56, 75

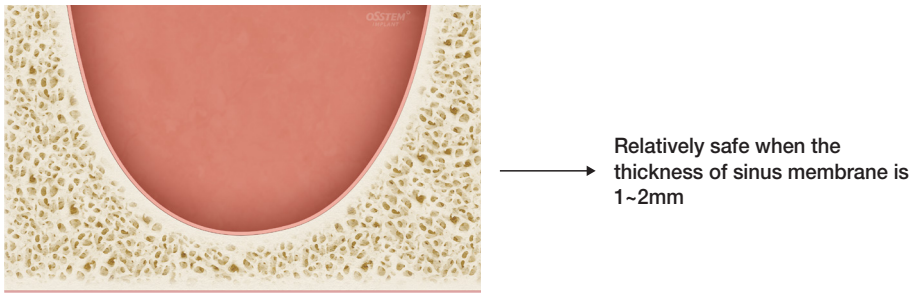
Presented by Dr. Park Jeong-cheol

Issue 3

① What is the recommended thickness of sinus membrane for the safe sinus surgery to prevent perforation risk?

Consensus 3

- ① When the thickness of sinus membrane is 1~2mm, it has lower risk of perforation.
- In case where thickness of sinus membrane is thinner than 1mm or thicker than 2mm(if there might be a pathological finding), there is a higher risk of perforation.



Reference

Presented by Dr. Park Jeong-cheol

- Tiziano Testori, et. al. Perforation Risk Assessment in Maxillary Sinus Augmentation with Lateral Wall Technique. The International Journal of Periodontics & Restorative Dentistry. Volume 40, Number 3, 2020
- SC Wen, et. al. The influence of sinus membrane thickness upon membrane perforation during transcrestal sinus lift procedure. Clin Oral Implants Res. 2015 : 26(10) : 1158-1164
- YH Lin, et. al. The influence of sinus membrane thickness upon membrane perforation during transcrestal sinus lift procedure. Clin Oral Implants Res. 2016 : 27(5) : 612-617
- Alberto Monje, et. al. Schneiderian Membrane Thickness and Clinical Implications for Sinus Augmentation: A Systematic Review and Meta-Regression Analyses. J Periodontol. 2016 : 87(8) : 888-899
- D Uçar Boyacıgil, et. al. The effect of residual bone height and membrane thickness on sinus membrane perforation in crestal sinus grafting: A prospective clinical study. International Journal of Oral and Maxillofacial Surgery. 2021 : 50(2) : 251-257

Issue 4

- ① What is the proper prescription method of nasal decongestants for the patency of maxillary ostium(to prevent sinusitis)?
- ② Is it proper to use corticosteroid(e.g., prednisolone) for a short period for the patency of maxillary ostium(to prevent sinusitis).

Consensus 4

- ① For the patency of maxillary ostium, pseudoephedrine(nasal decongestants) is prescribed as a single agent.
- It is not recommended to use the complex agents of Pseudoephedrine.
 - Pseudoephedrine(30mg) is administered three times/day for 3~4 days.
 - Nasal decongestants is classified as below.

Classification		Name	Product name
Phenylamine group	Single agent	Pseudoephedrine	Pseudoephedrine
	Complex agents	Pseudoephedrine+Chlorpheniramine	Antico
		Pseudoephedrine+Acrivastine	Duetact
		Pseudoephedrine+Ebastine	Rino-Ebastel
		Pseudoephedrine+Fexofenadine	Allegra D
		Pseudoephedrine+Cetirizine	Cirus, Cipan, etc
		Pseudoephedrine+Triprolidine	Actifed, etc.
		Phenylephrine+Chlorpheniramine	Comy, Cobian-S syrup

* It is generally administered orally, and prescription is restricted for those with hypertension, hyperthyroidism, heart disease, arrhythmia, diabetes, glaucoma, prostatic hyperplasia, gastric ulcer, infants less than 1 year old, the elderly over 60, and pregnant women.

Classification	Name	Product name
Imidasoline group	Phenylephrine	Phenepyrin nasal drops 0.5%, Twin Nasal Spray
	Oxymetazoline	Respibien solution
	Xylometazoline	Otrivin Menthol 0.1% spray
	Naphazoline	Narista-S nasal Solution

* It is used locally in the nasal cavity(nasal spray), but the continuous use for more than 7~10 days is not recommended due to the risk of tolerance, drug-induced rhinitis, withdrawal symptoms and rebound symptoms.

Consensus 4

- ② Short-term use of corticosteroid(e.g., prednisolone) is appropriate when prescription of pseudoephedrine is restricted due to heart disease or benign prostatic hypertrophy(BPH).
- It can be prescribed for a short period to reduce and prevent nasal mucous edema(for patency of maxillary ostium).
 - Prednisolone(5~10mg) is administered once every morning for 5 to 7 days.

Reference

• Korean Rhinologic Society. Treatment Guideline for Rhinosinusitis). 2005

• Dae Sun Jo, Management of Acute Otitis Media and Acute Sinusitis: Clinical Guidelines, Childhood Infection Vol. 15, No. 2, 2008

• Tiziano Testori, et. al. Prevention and Treatment of Postoperative Infections after Sinus Elevation Surgery: Clinical Consensus and Recommendations. International Journal of Dentistry. Volume 2012, Article ID 365809, 5 pages

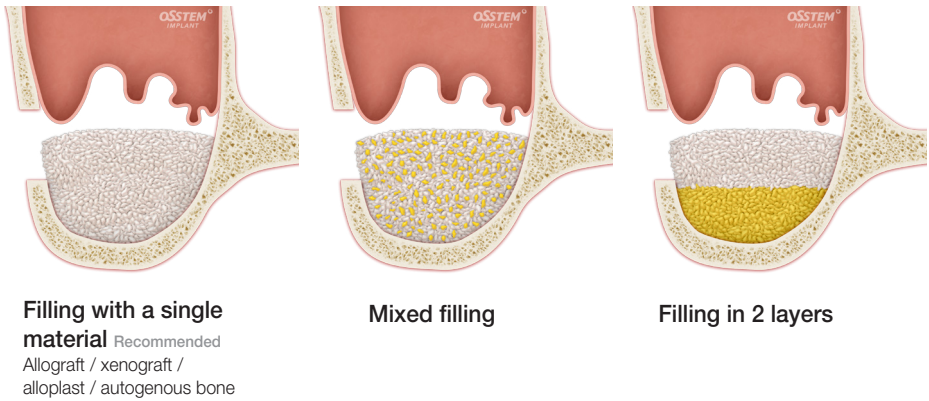
Presented by Dr. Son Young-whee

Issue 5

- ① What is the recommended bone grafting material and bone grafting method for maxillary sinus bone grafting?

Consensus 5

- ① For bone grafting of maxillary sinus, filling with a single bone graft material is recommended.
- Allograft and xenograft are the most widely used in Korea.
 - In case of using the composite bone graft materials, there are two methods:
 - Mixed filling : Two different materials are mixed and then filled.
 - ex) Allograft + xenograft/alloplast, Autogenous bone + allograft/xenograft/alloplast
 - Filling in 2 layers: Two different bone graft materials are filled in 2 layers.
 - ex) Lower part of sinus: allograft/autogenous bone, Upper part of sinus: xenograft/alloplast



Reference

• Fouad Khoury, et. al. Stability of Grafted Implant Placement Sites After Sinus Floor Elevation Using a Layering Technique: 10-Year Clinical and Radiographic Results. Int J Oral Maxillofac Implants. 2017;32:1086–1096

• Massimo Del Fabbro, et. al. Systemic Review of Survival Rates for Implants Placed in the Grafted Maxillary Sinus. Int J Periodontics Restorative Dent. 2004;24:565–577

• Nicolaas C. Geurs, et. al. Retrospective Radiographic Analysis of Sinus Graft and Implant Placement Procedures from the Academy of Osseointegration Consensus Conference on Sinus Grafts. Int J Periodontics Restorative Dent. 2001;21:517–523

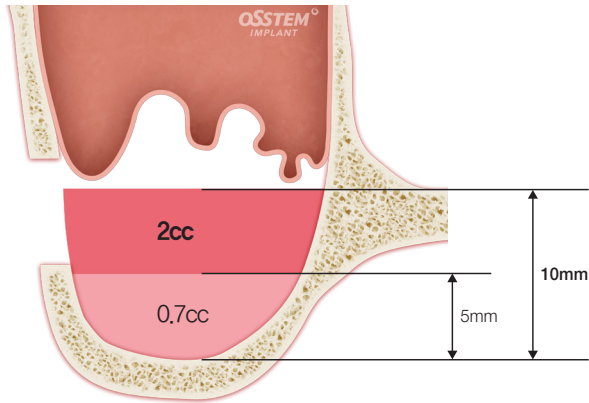
Presented by Dr. Son Young-whee, Lee Dae-hee

Issue 6

① What is the appropriate amount(cc) of bone graft material when elevating the maxillary sinus by 10mm?

Consensus 6

- ① When elevating the maxillary sinus by 10mm, the appropriate amount of bone graft material is about 2cc.
- When elevating the maxillary sinus by 5mm, the 0.7cc is appropriate.
 - But the amount of bone graft material differs depending on the width of maxillary sinus floor, etc.



Reference

Presented by Dr. Son Young-whee

• Yuki Uchida, et. al. Measurement of Maxillary Sinus Volume Using Computerized Tomographic Images. Int J Oral Maxillofac Implants. 1998;13:811-818

• JH Lee, et. al. Measurement of maxillary sinus volume and available alveolar bone height using computed tomography. Korean J Oral Maxillofac Radiol. 2003;33:35-41

• HW Kim, et al. Measurement of maxillary sinus volume for the placement of graft material – A case control study using CT. J. Kor. Oral Maxillofac. Surg. 2007;33:511-517

Prosthodontic part

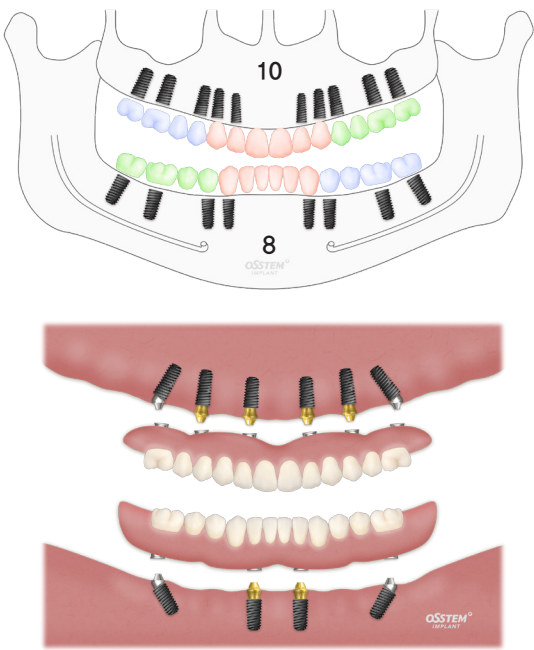
Prosthodontic
part

Issue 1

- ① How many implants are recommended to be placed for full fixed bridge in edentulous patients?
- ② How many implants are recommended to be placed for hybrid denture prosthesis in edentulous patients?

Consensus 1

- ① For full fixed bridge implant in edentulous patients, the placement of 8 to 10 implants is recommended including the second molar site and the placement of 6 to 8 implants is recommended including only the first molar site.
- ② For hybrid denture implant prosthesis treatment in edentulous patients, the placement of 6 implants are recommended in maxilla and the placement of 4 implants are recommended in mandible.



Reference

• Paulo Maló DDS, et. al. All-on-Four® Immediate-Function Concept with Brånemark System® Implants for Completely Edentulous Mandibles: A Retrospective Clinical Study. Clin Implant Dent Relat Res. 2005 Feb;7 Suppl 1(1, supplement):S88-94

• Sebastian B M Patzelt, et. al. The all-on-four treatment concept: a systematic review. Clin Implant Dent Relat Res. 2014 Dec;16(6):836-55

• David Soto-Penaloza, et al. The all-on-four treatment concept: Systematic review. J Clin Exp Dent. 2017 Mar 1;9(3):e474-e488

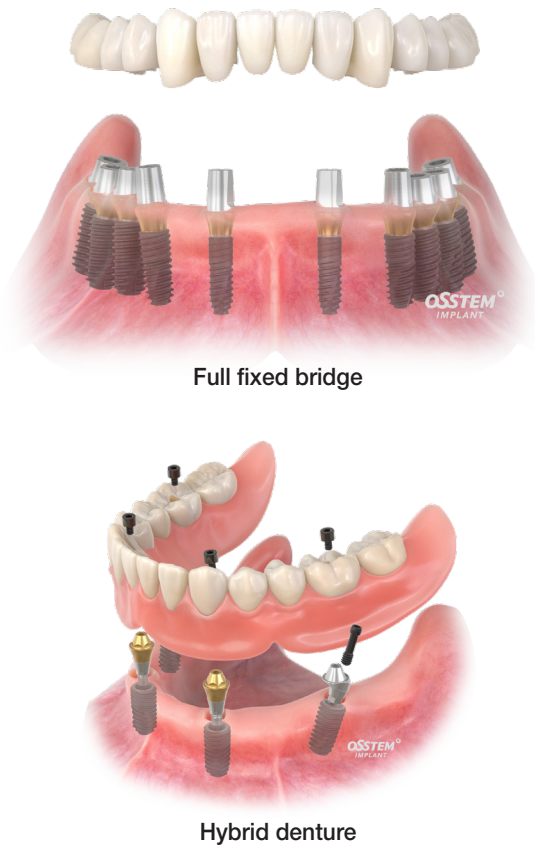
Presented by Pf. Noh Kwan-tae

Issue 2

- ① What is the proper term for edentulous implant prosthesis using fixed bridge?
- ② In edentulous implant prosthesis, is it proper to use the term “hybrid denture”?

Consensus 2

- ① The term “full fixed bridge” is recommended for the edentulous implant fixed bridge.
- ② The term “hybrid denture” can be used for the fixed detachable edentulous bridge.



Reference

• GTP(The glossary of prosthodontic terms) ninth edition

• Harel Simon, et. al. Terminology for implant prostheses. Jul-Aug 2003;18(4):539-43.

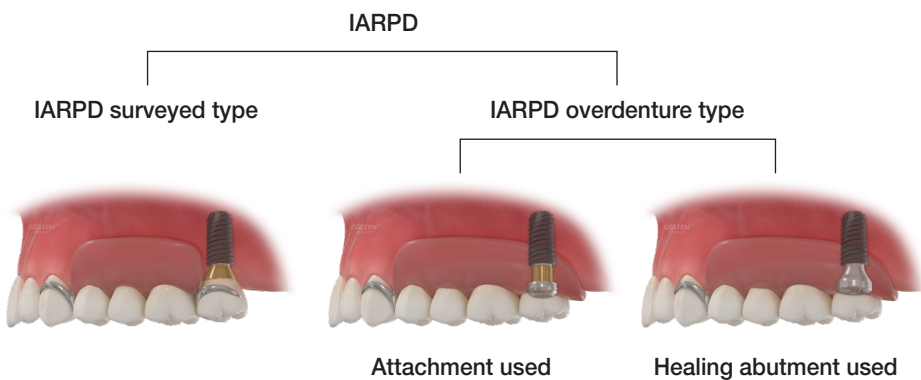
Presented by Pf. Lee Joon-seok

Issue 3

- ① What is the proper term for partial denture supported by implants?
- ② What is the classification of partial denture supported by implants?

Consensus 3

- ① Partial denture supported by implants can be called IARPD (Implant assisted removable partial denture).
- ② Partial denture supported by implants are classified into surveyed type and overdenture type.
 - Surveyed type is the IARPD using surveyed implant crown.
 - Overdenture type is the IARPD using attachment and healing abutment.



Reference

Presented by Dr. Cho Young-jin, Kim Hak-Hu

• GTP(The glossary of prosthodontic terms) ninth edition

• Dental prosthodontics glossary 4th edition published by The Korean Academy of Prosthodontics

• Stewarts' clinical removable partial prosthodontics fourth edition

• EB Bae, et. al. A Clinical Retrospective Study of Distal Extension Removable Partial Denture with Implant Surveyed Bridge or Stud Type Attachment. Biomed Res Int. 2017;2017:7140870

• YK Oh, et al. Retrospective clinical evaluation of implant-assisted removable partial dentures combined with implant surveyed prostheses. J Prosthet Dent. 2021 Jul;126(1):76-82

• SH Kang, et. al. Survival rate and clinical evaluation of the implants in implant assisted removable partial dentures: surveyed crown and overdenture. J Adv Prosthodont. 2020 Aug;12(4):239-249

Issue 4

- ① What is the guideline of ISQ value for immediate, early and delayed loading?

Consensus 4

- ① In most of clinical cases, the recommendable ISQ value is 5 points higher than the data provided by Osstell company. The following table shows ISQ guideline.

	Single case	Partial case	Full splint
Immediate loading	ISQ ≥ 75	ISQ ≥ 70	ISQ ≥ 65
Early loading	ISQ 70-74	ISQ 65-69	ISQ 60-64
Delayed loading	ISQ ≤ 69	ISQ ≤ 64	ISQ < 60

Reference

Presented by Dr. Joo Hyun-cheol, Kim Hak-Hu

• Lars Sennerby. 20 years of experience with resonance frequency analysis. Implantologie. 21(1):21-33.

• Vladimir Kokovic, et. al. Immediate vs. early loading of SLA implants in the posterior mandible: 5-year results of randomized controlled clinical trial. Clin Oral Implants Res. 2014 Feb;25(2):e114-9.

• Michael M Bornstein, et. al. Early loading of nonsubmerged titanium implants with a chemically modified sand-blasted and acid-etched surface: 6-month results of a prospective case series study in the posterior mandible focusing on peri-implant crestal bone changes and implant stability quotient (ISQ) values. Clin Implant Dent Relat Res. 2009 Dec;11(4):338-47.

• Serge Baltayan, et. al. The Predictive Value of Resonance Frequency Analysis Measurements in the Surgical Placement and Loading of Endosseous Implants. J Oral Maxillofac Surg. 2016 Jun;74(6):1145-52.

• Pär-Olov Ostman, et. al. Direct implant loading in the edentulous maxilla using a bone density-adapted surgical protocol and primary implant stability criteria for inclusion. Clin Implant Dent Relat Res. 2005;7 Suppl 1:S60-9.

• Daniel Rodrigo, et. al. Diagnosis of implant stability and its impact on implant survival: a prospective case series study. Clin Oral Implants Res. 21, 2010; 255–261.

• L Pagliani, et. al. The relationship between resonance frequency analysis (RFA) and lateral displacement of dental implants: an in vitro study. J Oral Rehabil. 2013 Mar;40(3):221-7.

• Paolo Trisi PhD, et. al. Implant Stability Quotient (ISQ) vs Direct in Vitro Measurement of Primary Stability (Micromotion): Effect of Bone Density and Insertion Torque. J Osteol Biomat. 2010; 1:141-151.

• Stefan Paul Hicklin, et. al. Early loading of titanium dental implants with an intra-operatively conditioned hydrophilic implant surface after 21 days of healing. Clin Oral Implants Res. 2016 Jul;27(7):875-83.

• IH Cho, et. al. A comparative study on the accuracy of the devices for measuring the implant stability. J Adv Prosthodont. 2009 Nov;1(3):124-8.

• R Jaramillo, et. al. Comparative analysis of 2 resonance frequency measurement devices: Osstell Mentor and Osstell ISQ. Implant Dent. 2014 Jun;23(3):351-6.

Issue 5

① Is the adjustment of implant prosthesis similar to that of natural teeth?

Consensus 5

- ① Occlusion adjustment of implant prosthesis could be similar to natural teeth.
- Contact point and occlusal strength should be similar to that of natural teeth prosthesis, and then mutually protected occlusion is recommended.
 - Concept of long centric is permitted, and cuspal inclination should be adjusted to reduce the lateral force which is harmful to implants during eccentric movement.



Contact point similar to adjacent natural teeth

Reference

Presented by Dr. Park Jong-hun

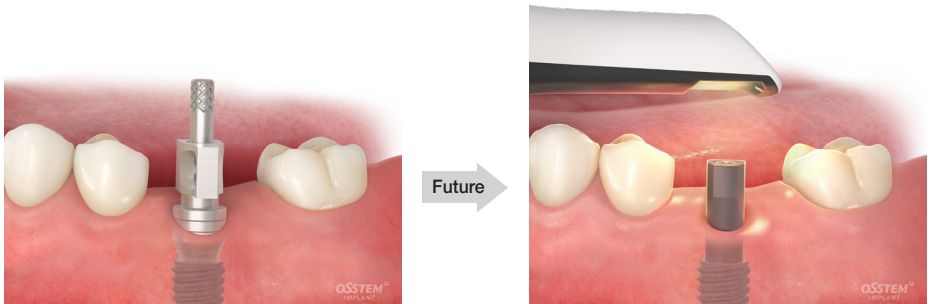
- BS Jeon, et. al. Possibility and Limitation of Applying Occlusal Adjustment on Implant Prosthesis similar to Natural Teeth. Journal of implantology and applied sciences. September 2018. 162-172
- YB Park,. Clinical considerations for appropriate occlusion of implant restorations. J Kor DentAssoc. 2015; 53: 418-426
- Shiming Liu, et. al. Influence of occlusal contact and cusp inclination on the biomechanical character of a maxillary premolar: A finite element analysisA review of the literature. J Prosthet Dent 2014;112:1238-1245
- Jae-Hong Lee, et. al. Association between dental implants in the posterior region and traumatic occlusion in the adjacent premolars: a long-term follow-up clinical and radiographic analysis. J Periodontal Implant Sci. 2016 Dec;46(6):396-404
- L A Weinberg. Reduction of implant loading with therapeutic biomechanics. Implant Dent. 998;7(4):277-85
- Okeson JP. Management of temporomandibular disorders and occlusion. 7th ed. St. Louis: Mosby/Elsevier; 2013. p. 443-468
- BS Jeon, et. al. Possibility and Limitation of Applying Occlusal Adjustment on Implant Prosthesis similar to Natural Teeth. Implantology 2018; 22(3): 162-172
- Kaukinen JA, et. al. The influence of occlusal design on simulated masticatory forces transferred to implant-retained prostheses and supporting bone. J Prosthet Dent. 1996 Jul;76(1):50-5.
- The Korean Academy of Stomatognathic Function & Occlusion. Textbook of human jaw function & occlusion. Seoul: Yenang Inc.; 2014 p. 363-7, 387
- R. J. Chapman, et al. Principles of occlusion of implant prostheses: guidelines for position, timing, and force of occlusal contacts. Quintessence Int. 1989; 20: 473-480
- D Wismeijer, et. al. Factors to consider in selecting an occlusal concept for patients with implants in the edentulous mandible. J Prosthet Dent. 1995 Oct;74(4):380-4

Issue 6

① Which method is recommended to take impression for implant prosthesis, pick-up type or transfer type?

Consensus 6

- ① Pick-up type is more recommendable than transfer type.
- The use of bite impression coping and transfer type is also possible.
 - In the future, digital impression with scan body is expected to be more widely used.



Reference

Presented by Dr. Kim Hak-Hu

