OSSTEM IMPLANT

2021 1st

OSSTEM IMPLANT CONSENSUS REPORT

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Contents

Meeting Schedule

Date 2021.08.15 (09:00~18:00)

Venue Osstem Implant Seoul

Schedule	Time		Agenda
Opening	10:00 ~ 10:05	5mins	Introduction of the workshop schedule and guests
	10:05 ~ 10:10	5mins	Greeting from the Chairman
	10:10 ~ 10:20	10mins	Sharing the 2021 workshop status
Session 1	10:20 ~ 10:50	30mins	Improvement from Edition 5 and status of Osstem products
	10:50 ~ 11:20	30mins	Sharing the development status of dental training manikin
	11:20 ~ 11:50	30mins	Presentation on the topics of Edition 6 and survey results
Lunch	11:50 ~ 13: 30	100 min.	Lunch
Session 2	13:30 ~ 14:30	60mins	- Sharing the examples from examination evaluation committee (Dr. Park Jong Hyun) - Requesting the guide on examination evaluation and participation in the survey
Break	14:30 ~ 14:50	20mins	Break
Session 3	14:50 ~ 15:20	20mins	Consensus 1 : Common part
	15:20 ~ 17:50	150mins	Consensus 2 : S / P / D Moderator (S: Director Kim Kyoung-won, P: Director Cho In-ho)
	17:50 ~ 18:00	10mins	Consensus 3 : Presentation on the consensus results
Ending	18:00 ~ 18:10	10mins	Closing remark from the Chairman
Dinner	18:10 ~ 19: 30	80mins	Dinner

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
Surgery	Kim Kyoung-won	Director	Osstem Implant
	Kwon Young-sun	Director	Seoulsha Dental Clinic
	Kim Yong-jin	Director	Woori Dental Hospital
	Kim Jin	Professor	Catholic University of Korea, Daejeon st. Mary's Hospital
	Kim Chin-gu	Director	Yonsei 9 Dental Clinic
	Park Jeong-cheol	Director	Hyo Dental Clinic
	Park Chang-joo	Professor	Hanyang University Dental Hospital
	Son Young-whee	Director	e-Good Dental Clinic
	Ok Yong-ju	Director	Like my teeth Dental Clinic
	Yoon Hyun-joong	Professor	Catholic University of Korea, Daejeon st. Mary's Hospital
	Lee Dae-hee	Director	Lee Dae Hee Seoul Dental Clinic
	Lee In-woo	Director	Wonderplant Dental Clinic
	Jung Hyun-jun	Director	Yonsei Hill Dental Clinic
	Joo Sung-chae	Professor	Dongguk University Dental Center
	Han Se-jin	Professor	Dankook University Dental Hospital

Part	Director	Title	Dental Clinic Name
Prostho-dontics	Cho In-ho	Director	Osstem Implant
	Koh Jung-woo	Director	Seoul Plus Dental Clinic
	Kim Hak-hu	Director	Guoldam Dental Hospital
	Noh Kwan-tae	Professor	Kyunghee University Dental Hospital
	Park Jong-hun	Director	Duri Dental Clinic
	Lee Joon-seok	Professor	Dankook University Dental Hospital
	Jeon Jin	Director	Seoul Samsung Dental Clinic
	Jeong Chan-kwon	Director	Able Dental Clinic
	Cho Young-jin	Director	Seoul Deep-rooted Dental Clinic
	Joo Hyun-cheol	Director	Seoul S dental clinic
Digital	Bae Jeong-in	Director	Seoul Gangnam Dental Clinic
	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

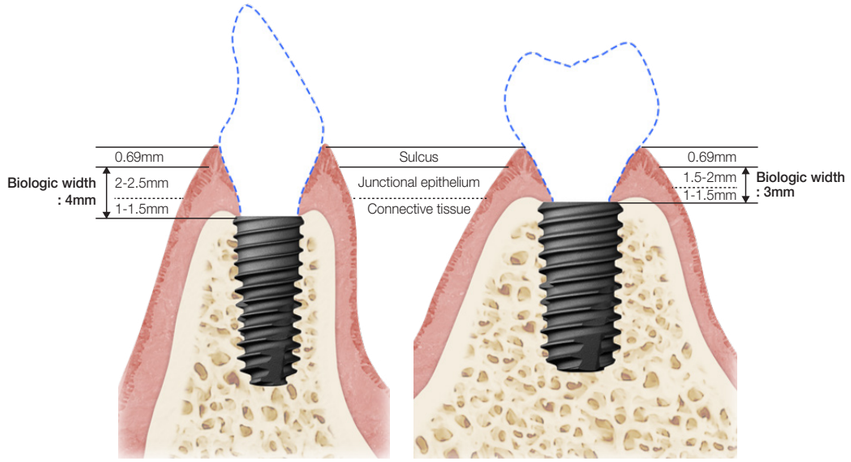
Issue 1

① Is it appropriate to use the term “Biologic Width” in implant?
② How long is biological width of implant in anterior region and posterior region?

Consensus 1

① In implant, the use of the term “biologic width” is appropriate.
- However, some groups suggest a new term “supracrestal tissue attachment” or “supracrestal tissue height”.

② Biologic width of implant is 4mm in the anterior region and 3mm in the posterior region.



Anterior region　　Posterior region

Reference　　Presented by Dr. Jung Hyun-jun

- Abrahamsson I, et. al. The peri-implant hard and soft tissues at different implant systems. A comparative study in the dog. Clin Oral Implants Res 1996: 7: 212–219.
- Cristiano Tomasi, et. al. Morphogenesis of peri-implant mucosa revisited: an experimental study in humans Clin Oral Implants. Res. 2014 Sep;25(9):997-1003. doi: 10.1111/clr.12223. Epub 2013 Jun 26.
- Søren Jepsen, et. al. Periodontal manifestations of systemic diseases and developmental and acquired conditions: Consensus report of workgroup 3 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions. J Periodontol. 2018 Jun;89 Suppl 1:S237-S248. doi: 10.1002/JPER.17-0733.
- Gustavo Avila-Ortiz, et. al. The peri-implant phenotype. J Periodontol . 2020 Mar;91(3):283-288. doi: 10.1002/JPER.19-0566. Epub 2020 Feb 21.
- Tomas Linkevicius, et. al. Influence of titanium base, lithium disilicate restoration and vertical soft tissue thickness on bone stability around triangular-shaped implants: A prospective clinical trial. May 2018Clinical Oral Implants Research 29(5)

Issue 2

① Is it appropriate to use the term “Thin biotype” and “Thick biotype”?
② What is the criteria that classify between “Thin biotype” and “Thick biotype”?

Consensus 2

① It is appropriate to use the term “Thin biotype” and “Thick biotype”.
② The width(2mm) of keratinized tissue determines “Thin biotype” vs “Thick biotype”. If the width of keratinized gingiva is less than 2mm, it is considered as “Thin biotype”, and if the width is more than 2mm, it is considered as “Thick biotype”.

Thin biotype

- Width of keratinized gingiva is less than 2mm with thin gingival thickness
- Tapered tooth
- Surface contact point(surface) is high
- Scalloped-shaped soft tissues and bone structure

Thick biotype

- Width of keratinized gingiva is more than 2mm with thick gingival thickness
- Squared tooth
- Surface contact point(surface) is wide and located near the root
- Flat-shaped soft tissues and bone structure

Reference　　Presented by Dr. Jung Hyun-jun

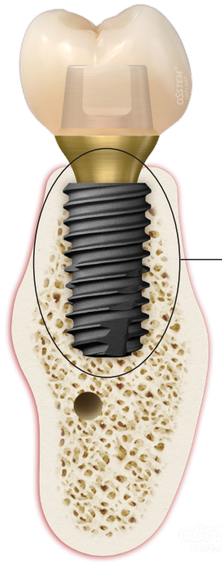
- Seibert JL, Lindhe J. Esthetics and periodontal therapy. In: Lindhe J, ed. Textbook of Clinical Periodontology, 2nd ed. Copenhangen, Denmark: Munksgaard; 1989: 477-514.
- De Rouck T, Eghbali R, Collys K, De Bruyn H, Cosyn J. The gingival biotype revisited: transparency of the periodontal probe through the gingival margin as a method to discriminate thin from thick gingiva. J Clin Periodontol. 2009;36(5):428-433.
- Weisgold A. Contours of the full crown restoration. Alpha Omegan. 1977;70(3):77-89.
- Claffey N, Shanley D. Relationship of gingival thickness and bleeding to loss of probing attachment in shallow sites following nonsurgical periodontal therapy. J Clin Periodontol. 1986;13(7):654-657.
- Muller HP, Eger T. Masticatory mucosa and periodontal phenotype: a review. Int J Periodontics Restorative Dent. 2002;22(2):172-183.
- Kao RT, Fagan MC, Conte GJ. Thick vs. thin gingival biotypes: a key determinant in treatment planning for dental implants. J Calif Dent Assoc. 2008;36(3):193- 198.

Issue 3

① Is it appropriate to continue to use the term “Fixture”?

Consensus 3

① We have agreed to use the term “Implant” instead of “Fixture”.
· The conclusion was reached according to the recommendation from ISO 1942:2020(E) (ISO), KS P ISO 1942:2020(Korea Industrial Standards Commission).



Implant (O)
Fixture (x)

Reference

Presented by Pf. Park Chang-joo

Surgery part

Surgery part

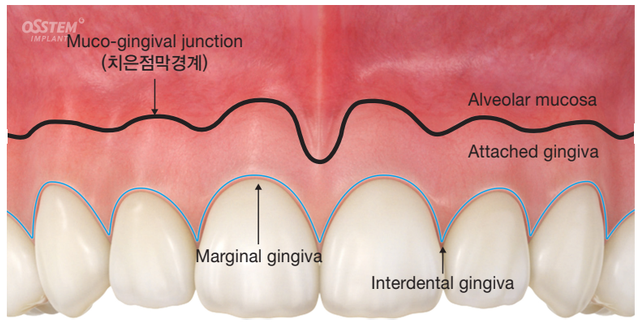
Issue 1

① Which of the following is the most appropriate in Korean-translated term for MGJ (Muco-gingival junction)? (“치조치은점막경계”, “치은점막경계”, “치은치조점막”)

Consensus 1

① “치은점막경계” is the most appropriate Korean translated term for muco-gingival junction.

· The standardized terminology has not been established by academia, but it is translated as muco-gingival junction (“치은점막경계”) in Periodontology textbook.



Reference

Presented by Pf. Yang Seung-min

• PERIODONTOLOGY. National Professor Council in periodontology. 7th Edition.

Issue 2

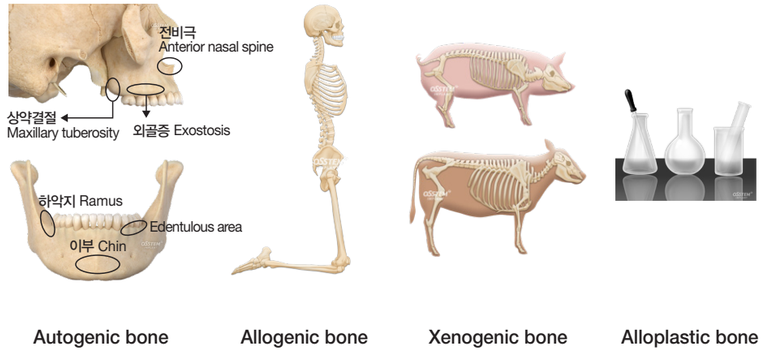
① What is the English name of “합성골”(alloplastic bone) and its definition?

Consensus 2

① “합성골” is officially translated into “alloplastic bone” in English, and refers to the bone synthetically made with biocompatible materials.

· Alloplastic is used as an adjective, implying surgery using alloplastic materials. In this regards, the English term of “alloplastic bone” is appropriate to use.

· In addition, “자가골” is autogenic bone, “동종골” is allogenic bone, “이종골” is xenogenic bone.



Autogenic bone | Allogenic bone | Xenogenic bone | Alloplastic bone

Reference

Presented by Dr. Ok Yong-ju

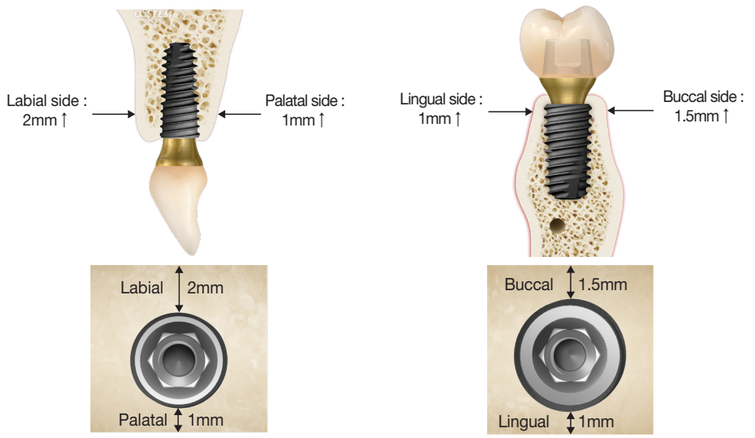
Issue 3

① What is the minimum bone width needed around the implant in the anterior and posterior region to maintain long-term stability of implant?

Consensus 3

① Minimum bone width of anterior region(including canine) is more than 2mm on the labial side and more than 1mm on the palatal(lingual) side.

· Minimum bone width of posterior region is more than 1.5mm on the buccal side and more than 1mm on the lingual(palatal) side



Reference

Presented by Dr. Park Jeong-cheol

- Joe Merheb, et. al. Critical buccal bone dimensions along implants. Periodontology 2000: 2014: 66(1): 97-105.
- Urs C. Belser, et. al. Outcome Evaluation of Early Placed Maxillary Anterior Single-Tooth Implants Using Objective Esthetic Criteria: A Cross-Sectional, Retrospective Study in 45 Patients With a 2- to 4-Year Follow-Up Using Pink and White Esthetic Scores. Journal of Periodontology: 2009: 80(1): 140-151.
- J. Robert Spray, et. al. The Influence of Bone Thickness on Facial Marginal Bone Response: Stage 1 Placement Through Stage 2 Uncovering. Annals of Periodontology: 5(1): 119-128.
- U Grunder, et. al. J. Robert Spray, et. al. Influence of the 3-D bone-to-implant relationship on esthetics. Annals of Periodontology: 2005: 25(2): 113-117.

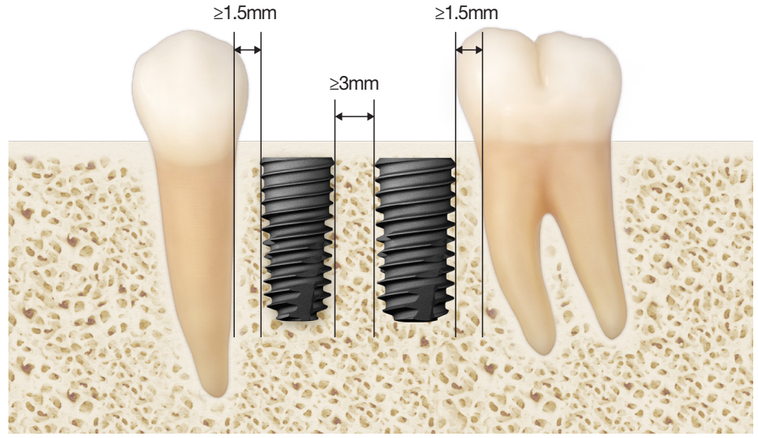
Issue 4

① What is the appropriate distance between natural tooth and implant, and the appropriate distance between implant and implant?

Consensus 4

① While the appropriate distance between the natural tooth and implant is at least 1.5mm, the appropriate inter-implant distance is at least 3mm.

· For bone-level internal connection type implant(Osstem's TS and KS system), the inter-implant distance is more than 3mm, and the distance between the implant and adjacent tooth is more than 1.5mm.



Reference

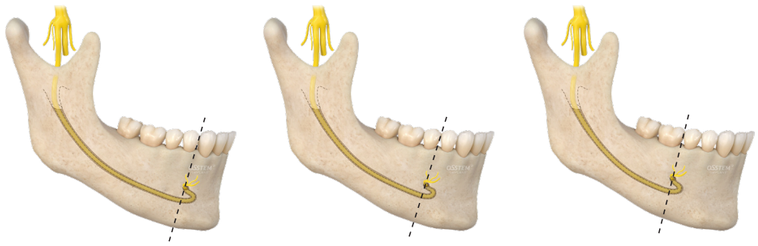
Presented by Dr. Son Young-whee

Issue 5

① In which area is the anatomical location of mental foramen mostly located?

Consensus 5

① In most of cases, the mental foramen is located in P_1-P_2 area



Front area of P_1

P_1–P_2 area
→ in most cases

Back area of P_2

Reference

• Hee jin Kim, et. Al. The Morphology of the Mental Foramen in Korean Adult mandibles. The Korean J. Anat.: 1995: 28(1): 67-74.

• In-Soo KIM, et. al. Position of the Mental Foramen in a Korean Population: A Clinical and Radiographic Study. IMPLANT DENTISTRY. : 2006: 15(4): 404-408.

Presented by Dr. Ok Yong-ju

Issue 6

① What is the recommended diameter of implants according to tooth location?

Consensus 6

① Recommended diameter of #21(#11) is Ø4.0, #22(#12) is Ø3.5, #41(#31) is Ø3.0, and #42(#32) is Ø3.0. Recommended diameter of canine, premolar and molar are Ø4.0, Ø4.5, and Ø5.0, respectively.

Maxilla

Location	1 Central incisor	2 Lateral incisor	3 Canine	4 1st premolar	5 2nd premolar	6 1st molar	7 2nd molar
Cervical diameter of natural teeth (mm)	6.0	5.0	5.5	5.0	5.0	8.0	7.0
Implant diameter (Ø)	4.0	3.5	4.0	4.5	4.5	5.0	5.0

Mandible

Location	1 Central incisor	2 Lateral incisor	3 Canine	4 1st premolar	5 2nd premolar	6 1st molar	7 2nd molar
Cervical diameter of natural teeth (mm)	3.5	4.0	5.5	5.0	5.0	9.0	8.0
Implant diameter (Ø)	3.0	3.0	4.0	4.5	4.5	5.0	5.0

Reference

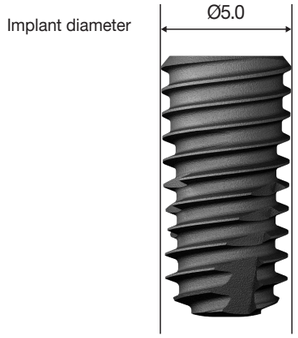
Presented by Dr. Lee In-woo

Issue 7

① How the diameter of implant is expressed?

Consensus 7

① The diameter of implants is expressed in Ø.
· Ex) If the diameter of implant is 5.0mm, the diameter is expressed in Ø5.0(mm can be omitted).



Issue 8

① What is the recommended implant length according to tooth location?

Consensus 8

① Regardless of the tooth location, the recommended implant length is 10mm.
· Depending on the bone quality, bone volume, and bone height of patients, implants of less than 8.5mm(or short implant) and implants of more than 11.5mm in length could be selected.

※ **Osstem implant length specifications** (Unit : mm)

Short	Standard				
6	7	8.5	**10**	11.5	13

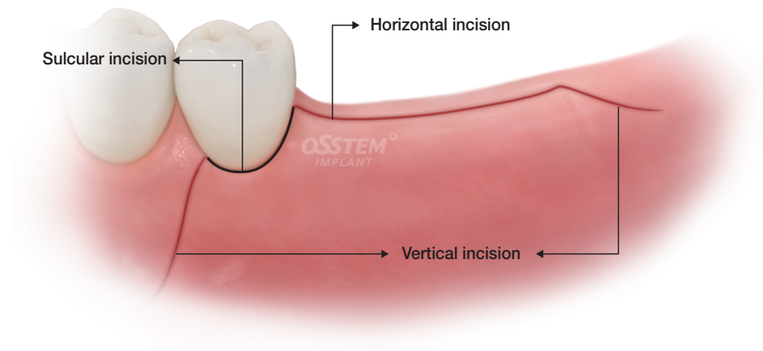
Issue 9

① Please specify the classification of incision and the incision-related terms.

Consensus 9

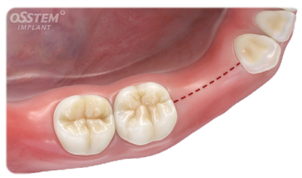
① Classification of incision and the incision-related terms are as follow:

1. Horizontal incision
   - Crestal incision
   - Paracrestal incision
2. Sulcular inclsion
3. Vertical incision

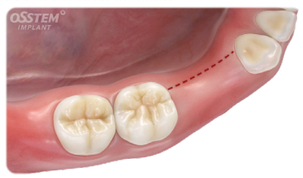


* Classification of horizontal incision

a. Crestal incision



b. Paracrestal incision



Reference

Presented by Dr. Kim Chin-gu

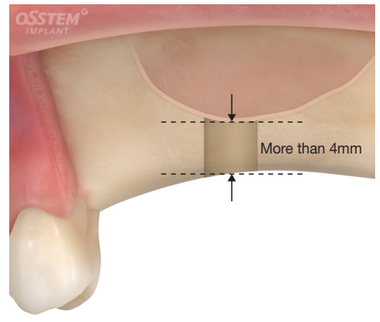
Issue 10

① How much residual bone height is required for crestal approach and lateral approach during the sinus surgery?

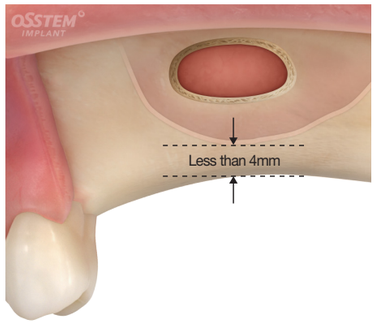
Consensus 10

① The 4mm of the residual bone height can be criteria that determines the approach method.

· If residual bone height is more than 4mm, crestal approach should be applied.
If residual bone height is less than 4mm, lateral approach should be applied.



Crestal approach



Lateral approach

Reference

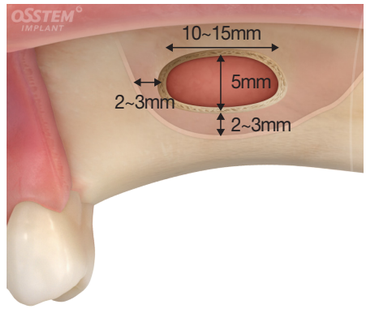
Presented by Dr. Lee Dae-hee

Issue 11

① Where is the recommended location of bony window in case of performing sinus surgery with lateral approach?

Consensus 11

① Inferior margin of bony window is located 2~3mm from sinus floor,
Superior margin of bony window is located more than 5mm from the inferior margin,
Anterior margin of bony window is located 2~3mm from anterior wall of the maxillary sinus,
Posterior margin of bony window is located 10~15mm posteriorly from anterior margin.
(Changeable depending on the implant placement in the posterior region)



- **Inferior margin**
  : **2~3mm** from sinus floor
- **Superior margin**
  : **More than 5mm** from inferior margin
- **Anterior margin**
  : **2~3mm** from anterior wall of the maxillary sinus
- **Posterior margin**
  : **10~15mm** from anterior margin
  (Changeable depending on the implant placement in the posterior region)

Reference

Presented by Dr. Kim Yong-jin

Prosthodontic part

Prosthodontic part

Issue 1

① Which one refers to custom-made implant abutment among the followings: custom abutment, customized abutment, and customizable abutment

Consensus 1

① The most appropriate term is ”custom abutment”.

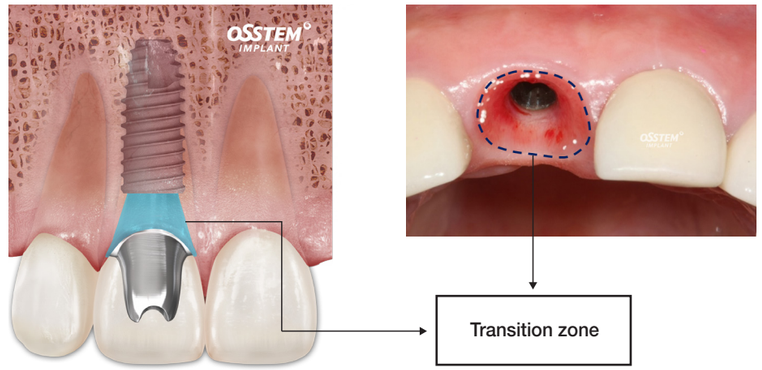
· The term “customized abutment” is used in cases where the concept is contrast with the “prefabricated abutment”.

Issue 2

① What is the term referring to the space from the top of the implant to gingival margin?

Consensus 2

① The term “transition zone” is better than “running room” for the space from the top of the implant to the gingival margin.

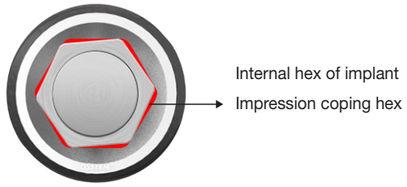


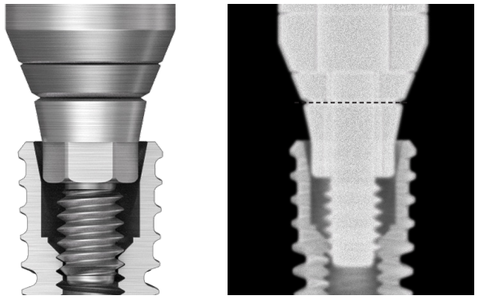
Issue 3

① What is the appropriate term in case of inaccurate connection of implant components?

Consensus 3

① Misconnection is correct term in the cases where the components of the implant are not accurately connected.





Misconnection

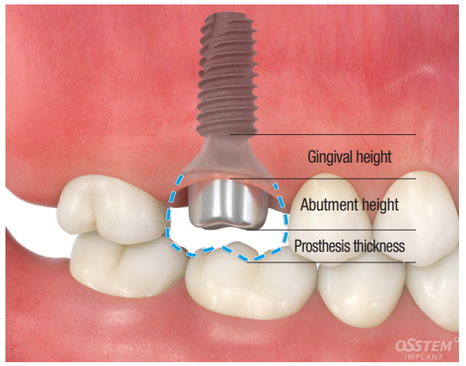
Issue 4

① What is optimal and minimal restorative space for each implant prosthesis type?

Consensus 4

① Optimal/Minimal restorative space is as follows:
- Optimal restorative space (In case of PFM crown)
  - For cement/ER type, optimal restorative space is 9~13mm.
  - For screw type, there is no limit in optimal restorative space.
- Minimal restorative space (In case of Metal/Gold crown)
  - For cement/ER type, minimal restorative space is 7mm.
    (Gingival height: 2mm, abutment height: 4mm, prosthesis thickness: 1mm)
  - For screw type, TS&US systems are 4.5mm, and SS system is 4mm.

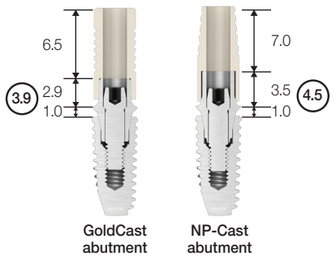
*** Optimal/Minimal restorative space for Cement type and ER type**

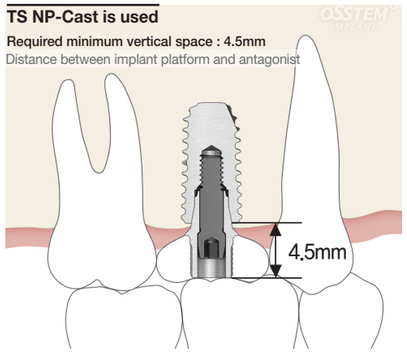


	Optimal (For PFM crown)	Minimal (For metal/ gold crown)
Gingival height	3~4mm	2mm
Abutment height	4~7mm	4mm
Prosthesis thickness	2mm	1mm

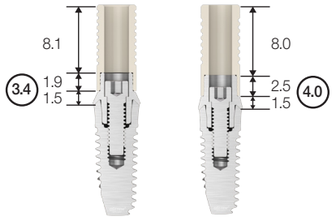
* Screw type

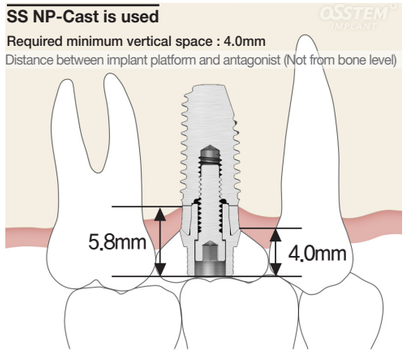
TS system



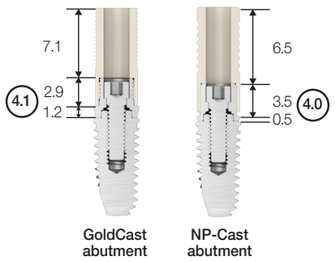


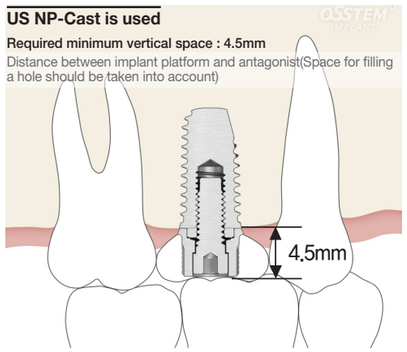
SS system





US system





Issue 5

① What is the optimal crown thickness according to restorative materials?
② What is the minimal crown thickness according to restorative materials?

Consensus 5

① The optimal crown thickness for each restorative material is as follows:
Gold: more than 1mm, PFM: more than 2mm(in case of metal occlusal surface : more than 1mm), zirconia: more than 1.5mm, glass ceramic: more than 2mm.
② It is very sensitive point to determine the minimal restorative space because of fracture and perforation.

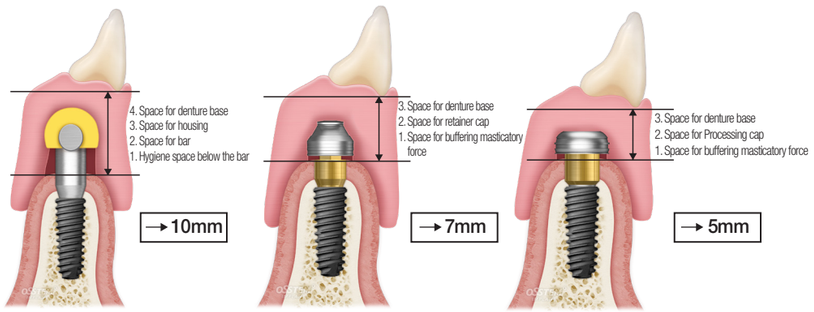
Material	Gold	PFM	Zirconia	Glass ceramic
Optimal thickness	More than 1mm	More than 2mm	More than 1.5mm	More than 2mm

Issue 6

① What is the restorative space for implant overdenture according to attachment type?
② What is the minimal restorative space for the implant overdenture according to the attachment type?

Consensus 6

① The restorative space for implant overdenture can be from the upper part of the soft tissues to the superior margin of denture base.
② According to the attachment types, the minimal restorative space is as follows:
bar type overdenture: 10mm, solitary type overdenture: O-ring(7mm), locator (5mm)



Bar type overdenture | O-ring | Locator

Reference — Presented by Pf. Noh Kwan-tae

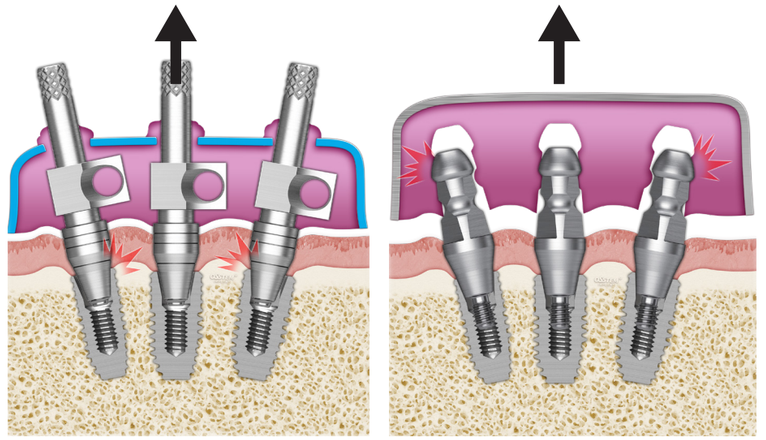
Issue 7

① What is the recommended impression method in case of non-parallel multiple implant bridge?
② Which impression method is better between pick-up type and transfer type in case of non-parallel multiple implant bridge?

Consensus 7

① Both digital impression(with scan body) and bite impression coping can be recommended.
② In such case, pick-up type impression coping is better than transfer type.

· In case of non-parallel multiple implant bridge, pick-up type is more convenient to detach the impression body. But in case of transfer type, it is difficult to remove impression body, because it might cause deformation of impression body. But the degree of deformation can differ depending on the applied impression material.



Pick-up type | Transfer type

Reference — Presented by Pf. Lee Joon-seok

Issue 8

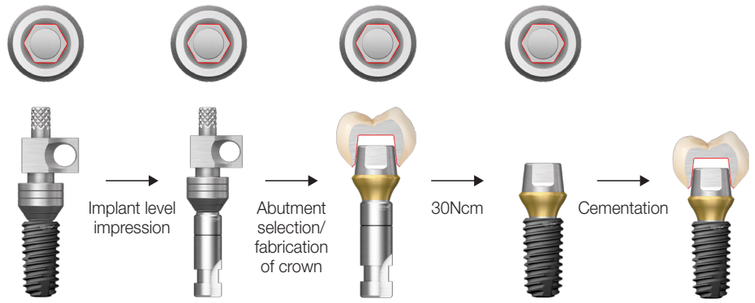
① Which is more accurate impression method between implant-level impression and abutment-level impression?

Consensus 8

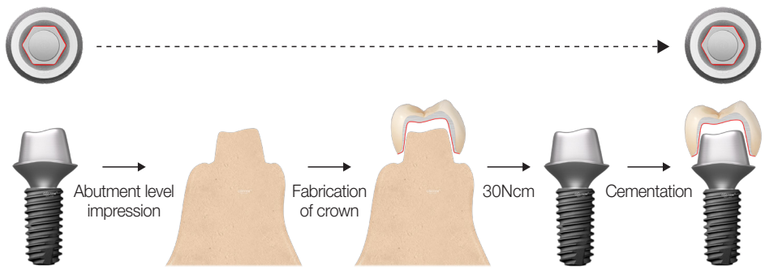
① It is difficult to determine which method is more accurate between implant-level impression and abutment-level impression.

- Compared to abutment-level impression, implant-level impression is useful for making more accurate margin of prosthesis, leading to the fabrication of precise prosthesis.
- Abutment level impression has low risk of hex misconnection between abutment and implant body.

Implant level impression



Abutment level impression



Reference

Presented by Pf. Lee Joon-seok

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Issue 9

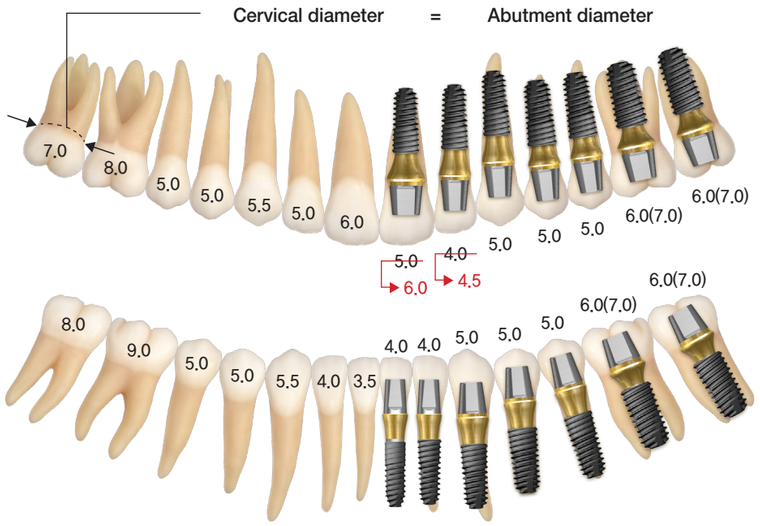
① What is the recommended abutment diameter under the assumption that the implant is placed in the center of the missing tooth?

Consensus 9

① It is recommended to choose the diameter of abutments as shown in Osstem Example, but the diameter of Ø6.0 and Ø4.5 is recommended for central incisor and lateral incisor, respectively.

· For maxillary central incisor, it is also possible to use the Ø5.0 diameter abutment, and the custom abutment is recommended. For mandible central incisor, the abutment with the diameter of Ø4.0 and the MS type can be used.

* Based on the smaller size between MD and BL
* Implant is guided to be placed in the center of the tooth



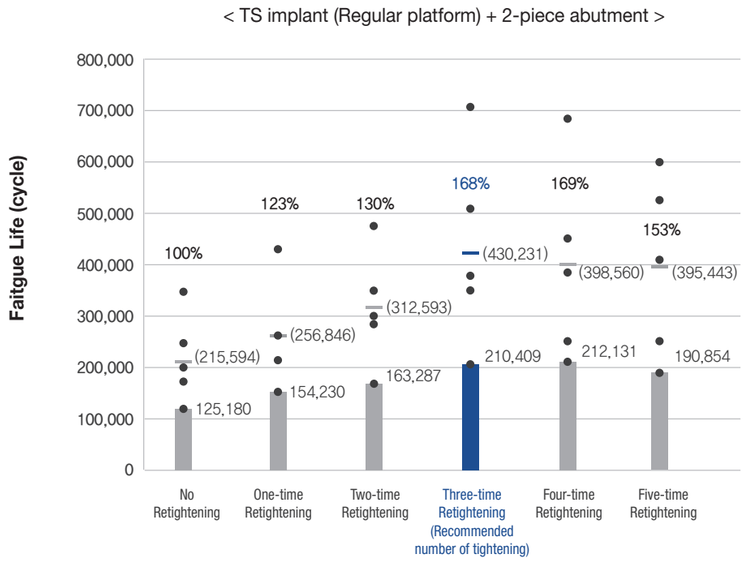
Reference
Presented by Dr. Koh Jung-woo

Issue 10

① What is the recommended screw tightening torque and method of Osstem Implant?

Consensus 10

① Osstem recommends three-time re-tightening, which includes 2~3 times of tightening with the torque of 30Ncm(regular) and 20Ncm(mini).



Reference
Presented by Dr. Joo Hyun-cheol

Digital part

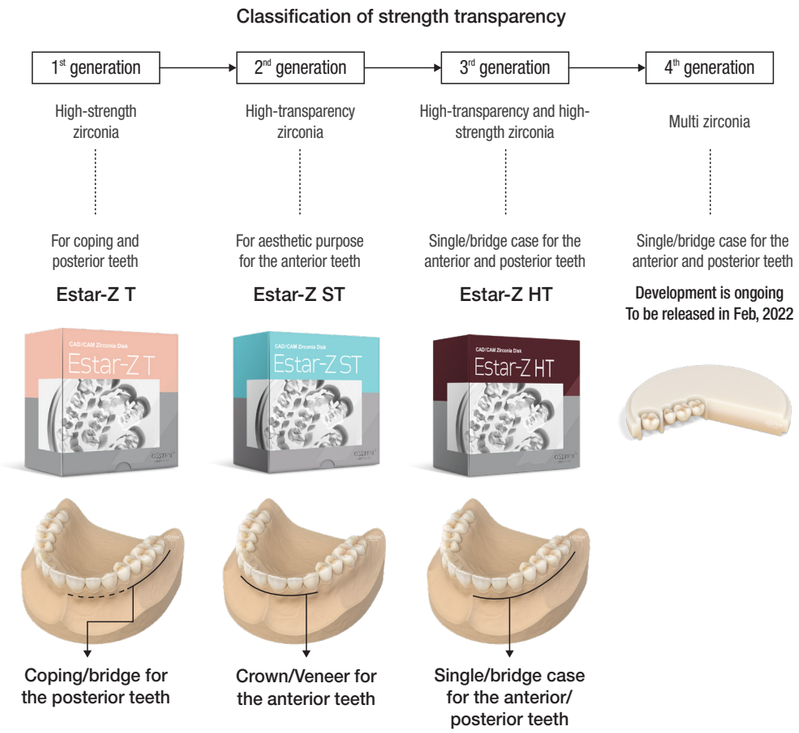
Digital part

Issue 1

① Is it proper to classify zirconia disc and blocks according to generation?

Consensus 1

① It is proper to classify zirconia disc and blocks according to generation.
· Each manufacturer has different classification on zirconia disc and blocks. Following classification is based on Osstem's zirconia developement.

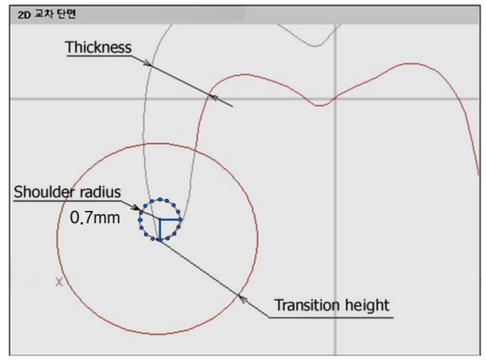


Issue 2

① What is the abutment shoulder radius of zirconia?

Consensus 2

① For zirconia, radius of abutment shoulder should be over 0.8mm.
· Radius of abutment shoulder differs depending on prosthodontic materials.

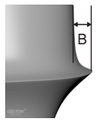


Knife Edge (Metal Crown)

0.1mm~0.2mm

Mod.Chamfer (PFM)

0.3mm~0.5mm



Deep Chamfer (PFZ / Full Zirconia Crown)

0.6mm 이상

OSSTEM IMPLANT

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