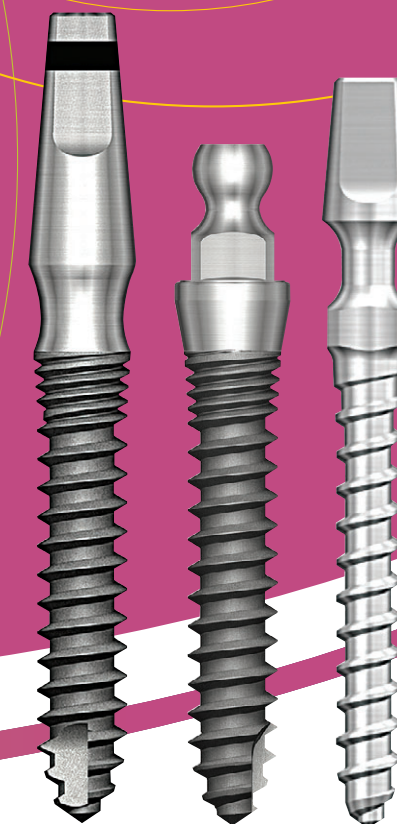


Edition 08 / 2014

MS Implant System



OSSTEM[®]
IMPLANT

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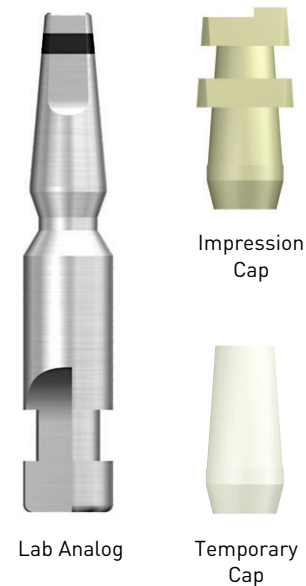
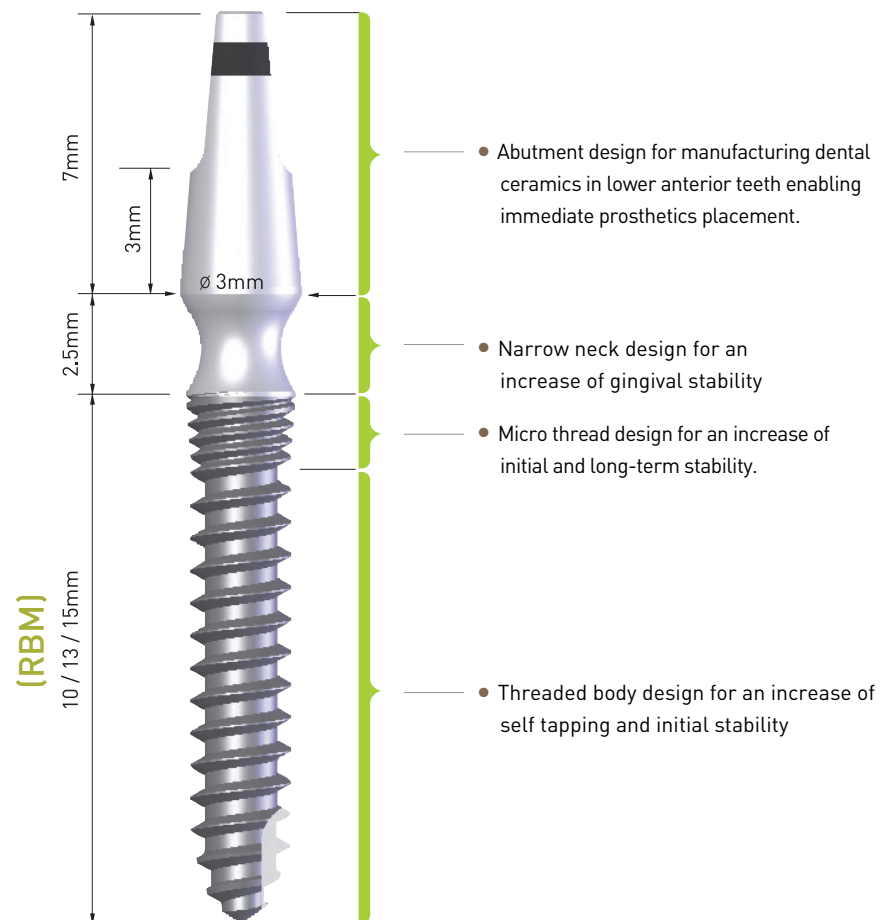
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● MS Implant for Narrow Ridge ↙



- This implant is suitable for a narrow ridge, such as the lower anterior region.
- Fixture and abutment are combined to withstand chewing pressure and Micro thread design was adopted to increase chewing power.
- RBM surface was adopted for quick osseointegration.
- The shape and the size of abutment part were optimized to enable prosthetics without cutting.
- Temporary cap increases the convenience of manufacturing immediate prosthetics.
- Impression cap and lab analog enable a sophisticated restorative process.

[Indications]

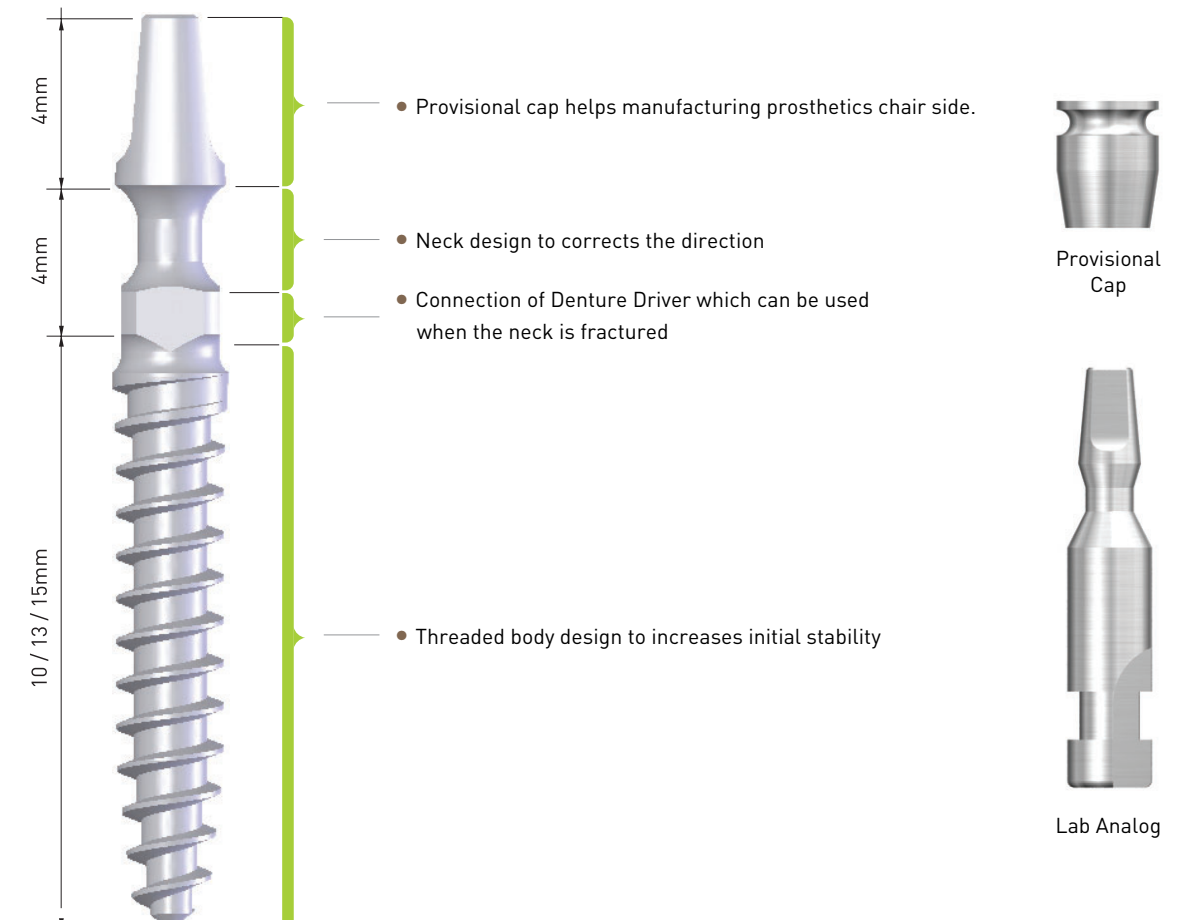


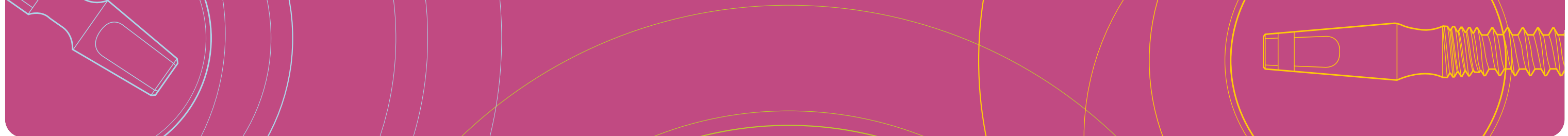
● MS Implant for Provisional ↙

- This implant is for immediate provisional prosthetics for partially and completely edentulous patients.
- Neck can bent for correct insertion.
- Titanium provisional cap and Lab analog enable easy manufacturing of provisional prosthetics.



[Indications]



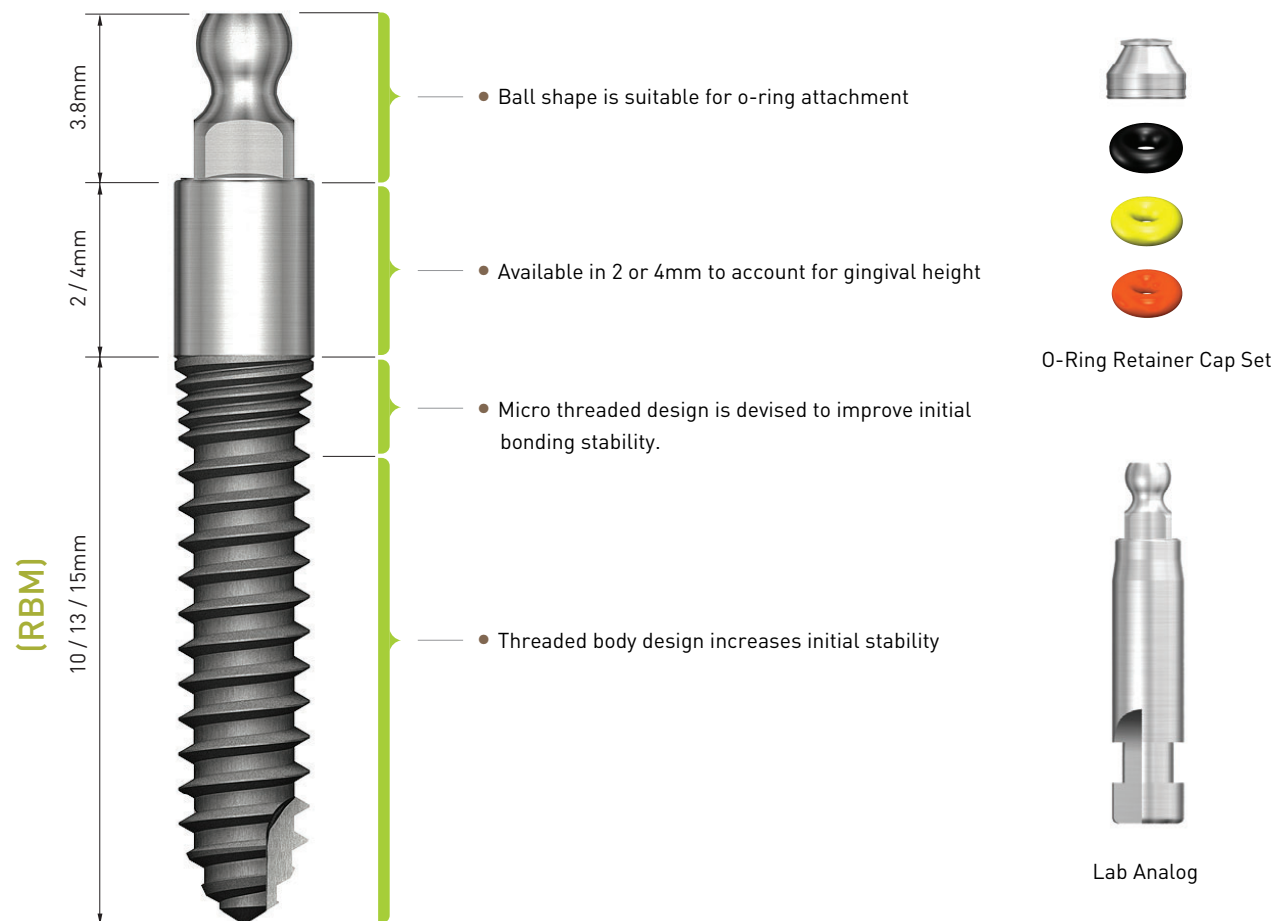


● MS Implant for Denture



- Denture-type implant is for edentulous patients with narrow ridge or for those cases in which a standard implant is not possible.
- Denture micro thread in the upper distributes chewing pressure throughout bone structure making it suitable for an immediate prosthetics placement.
- Denture retainer and lab analog allows easy and convenient denture manufacturing.

[Indications]



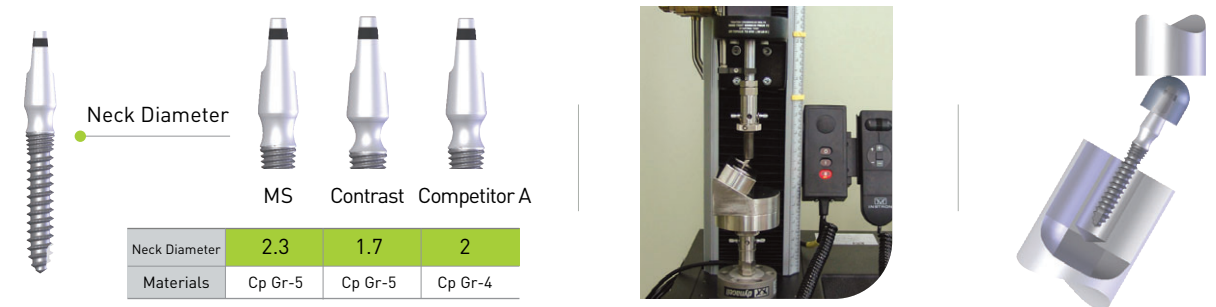
● Mechanical Drilling Power according to the Neck Design

Purpose

Combined fixture and abutment-shaped design enables implantation in a narrow ridge such as lower anterior region. Research on the effectiveness of narrow neck and safety of soft tissue is on going and new designs including platform switching have been invented. The effectiveness of narrow neck seems unclear. Therefore, fatigue stress and cycle-durability tests were conducted for each neck design.

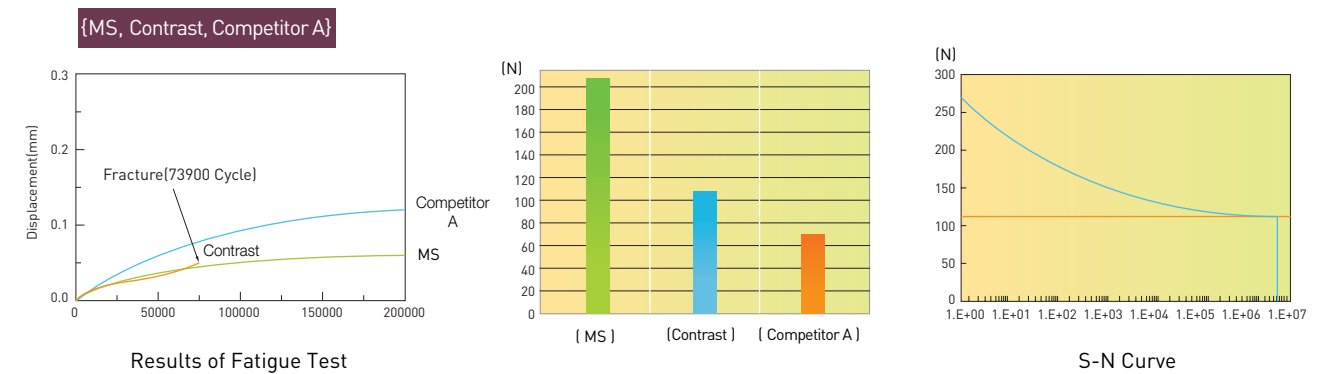
Materials & Method

Three test implants were made according to diameter and materials in neck areas. 5 test implants were manufactured per test. ISO14801 setting was arranged under the condition of 100N 30 5Hz 200,000 cycles. Additionally fatigue tests were conducted.



Test Results

All the test results show that MS implant is superior to others in terms of endurance and resistance against fatigue and torsion resistance.



● Analysis of Initial Stability According to Body Design

Purpose

To analyze the internal stress diversion of mini implant (the diameter of fixture is less than 3mm) through FEA.

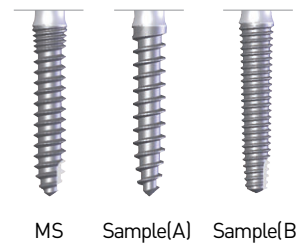
Materials & Method

Five categories of implants were developed in different settings of pitch, bone depth and micro thread. An analysis on internal stress diversion was done under the loading condition of 100N in 30°

*FEA: Finite-Element Analysis
 *ASTM: American Society of Testing Materials
 *ANSYS: Engineering software for FEA
 *ANOVA: Analysis of Variance

	Macro Thread		Micro Thread	
	Pitch	Depth	Pitch	Depth
MS	0.8	0.35	0.8	0.25
Sample(A)	1.0	0.4	None	
Sample(B)	0.5	0.2	None	

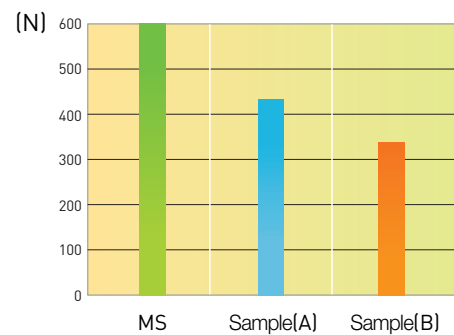
Unit : mm



Test Results

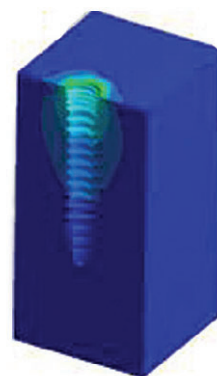
Pull-out and Push-out test show that MS implant has better results compared with Sample A and Sample B. FEA results show that MS implant has the highest internal stress diversion.

Results of Pull-Out Test



* Type A : MS Implant Narrow Ridge Type

Results of FEA



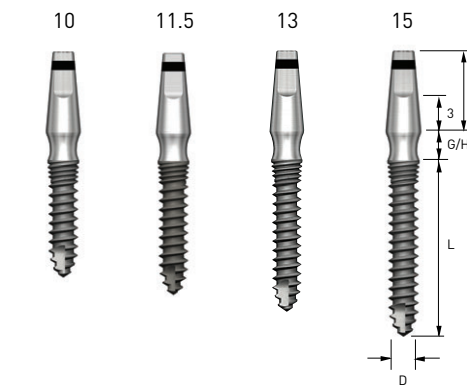
Unit: Mpa

	MS	Sample A	Sample B
Maximum Torque	26.6	33.2	35.1

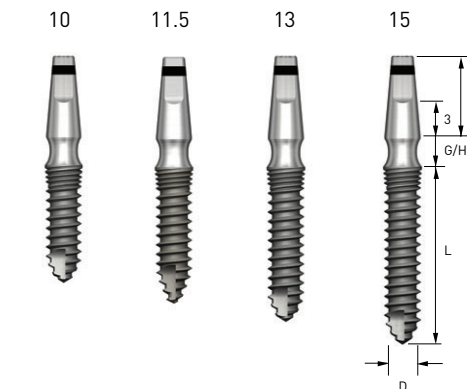
● MS Implant Components

MS Implant (Narrow ridge)

ø 2.5



ø 3.0



D	ø 2.5	
L \ G/H	2.5	4.0
10	MSP25103R	MSP25104R
11.5	MSP25113R	MSP25114R
13	MSP25133R	MSP25134R
15	MSP25153R	MSP25154R

D	ø 3.0	
L \ G/H	2.5	4.0
10	MSP30103R	MSP30104R
11.5	MSP30113R	MSP30114R
13	MSP30133R	MSP30134R
15	MSP30153R	MSP30154R

- A mini implant that is adequate for narrow space such as the mandibular anterior jaw
- One-body implant with micro thread design enhances the distribution of masticatory force
- RBM surface treatment enables fast osseointegration
- Optimized shape and size of abutment enables cutting-free prosthetic work
- Optimal design of body, thread, and drills to enhance initial bonding and bone penetration
- Packing unit : MS Implant (Narrow ridge)

Impression Cap (Narrow ridge)



Code	MSPIC
------	-------

- Use for precise impression work
- In case of non-modification of abutments : After taking an impression using an impression cap, make the prosthesis after creating a model using an analog
- In case of modification of abutment height only: After taking an impression using an impression cap, create a model using an analog and make the prosthesis by modifying the model shape according to the modification of abutment
- Packing unit : Impression cap

Temporary Cap (Narrow ridge)



Code	MSTPC
------	-------

- Use for making temporary prosthesis
- One-touch locking design
- Packing unit : Temporary Cap (Narrow ridge)

Lab Analog (Narrow ridge)

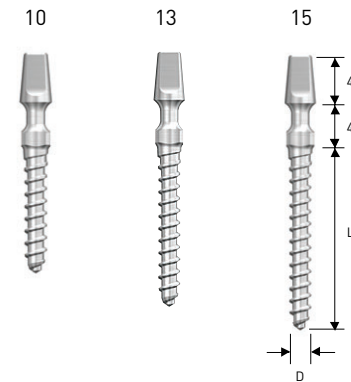


Code	MSPLA
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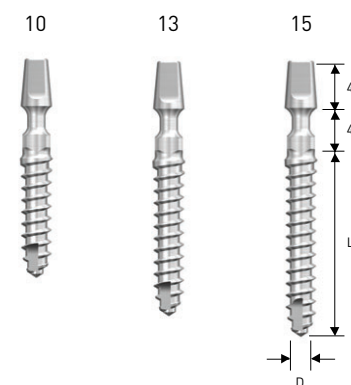
- Make an MS Implant (narrow ridge) abutment of the oral cavity onto a working model
- Packing unit : Lab Analog

MS Implant (Provisional)

ø 1.8



ø 2.5



L	D	ø 1.8
10		MST18104
13		MST18134
15		MST18154

L	D	ø 2.5
10		MST25104
13		MST25134
15		MST25154

- Implant to be used for the immediate mounting of temporary prosthesis for completely or partially edentulous patients
- Neck designed for path compensation and intensity support
- Simple system to make temporary prosthesis using titanium provisional caps and lab analogs
- Provisional cap facilitating prosthetic work chair side
- Rectangular structure at the bottom of the neck facilitates easy removal of provisional implant
- Optimized design of body, thread, and drilling to enhance initial bonding and bone penetration
- Packing unit : MS Implant (Provisional)

Provisional Cap (Provisional)



Lab Analog (Provisional)



Code	MSTPC
------	-------

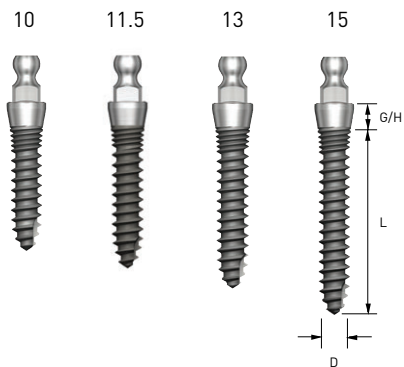
- Use for making temporary prosthesis (Titanium)
- Packing unit : Provisional Cap

Code	MSTLA
------	-------

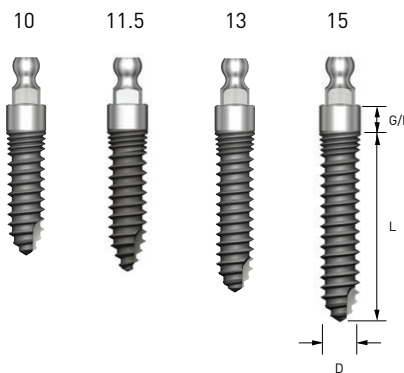
- Make an MS Implant (provisional) abutment of the oral cavity on a working model
- Packing unit : Lab Analog

MS Implant (Denture)

ø 2.5



ø 3.0



D		ø 2.5	
L	G/H	2.0	4.0
10		MSD25102R	MSD25104R
11.5		MSD25112R	MSD25114R
13		MSD25132R	MSD25134R
15		MSD25152R	MSD25154R

D		ø 3.0	
L	G/H	2.0	4.0
10		MSD30102R	MSD30104R
11.5		MSD30112R	MSD30114R
13		MSD30132R	MSD30134R
15		MSD30152R	MSD30154R

- Denture-type implant can be used in case of narrow ridge width for edentulous patients or if regular implant is inappropriate
- Micro thread on top helps distribute masticatory pressure to the alveolar bone; more advantageous for immediate prosthetic mounting
- Easy and convenient denture work through the use of retainers and lab analogs
- Ball-type structure for the connection of the O-ring attachment
- Use by selecting 2/4mm depending on the gingival height
- Packing unit : MS Implant (Denture)

Name	Code
O-Ring Retainer set	OARCS
O-Ring (For laboratory)	OA0100S
O-Ring (Low retention)	OA0400S
O-Ring (High retention)	OA0600S

- Use for making stud-type overdenture
- Use as an impression cap by connecting a black O-ring
- O-ring components
 - For lab use: Black color
 - For denture: Yellow color (4N), orange color (6N)
- Compensate the retention force through O-ring replacement
- Packing unit : Retainer Cap+ O-rings
- Tightening torque : 30 Ncm

Code	MSDLA

- Make an MS Implant (denture) abutment of the oral cavity on a working model
- Packing unit : Lab Analog

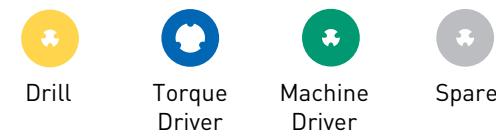
O-Ring Retainer Cap Set



Lab Analog (Denture)



MS KIT



Discemment Torque Drivers

Narrow Ridge Type : No hole on the head
Denture Type : A hole on the head

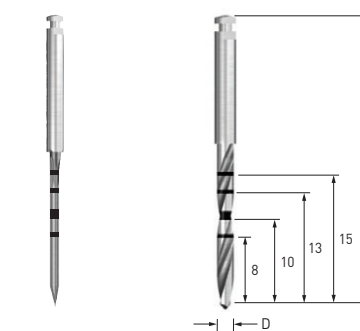
Narrow Ridge Type



Denture Type



Drill for MS Implant



Lance Drill

Twist Drill

Code	OMSK

• MS Implant KIT

• KIT Components (basic) 5-drill set

- ø 1.5mm Lance Drill
- ø 1.8mm Twist Drill Long
- ø 1.8mm Twist Drill Short
- ø 2.3mm Twist Drill Long
- ø 2.3mm Twist Drill Short

Drivers for the Narrow Ridge and Provisional types (4types)

- Machine Driver Long(Narrow Ridge)
- Torque Driver Long(Narrow Ridge)
- Machine Driver Short (Denture)
- Torque Driver Short (Denture)

1 set of 3

- Parallel Pin
- Driver Separator
- Depth Gauge

• KIT Components (optional)

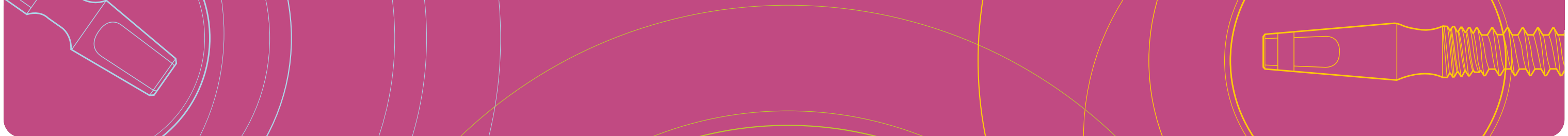
- #### 1 set of 3 types of drivers for denture
- Machine Driver Short(Narrow Ridge)
 - Torque Driver Short(Narrow Ridge)
 - Torque Driver Long (Denture)

1 set of 2 other types

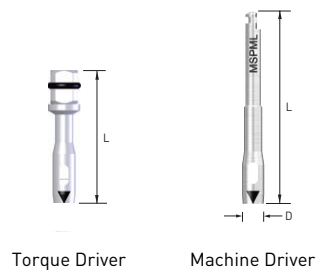
- Torque Handle
- Torque Wrench

Name	D	L	Code
ø 1.5mm Lance Drill	ø 1.5	35	OSLD15
ø 1.8mm Twist Drill Short	ø 1.8	32	OSMSD18S
ø 1.8mm Twist Drill Long	ø 1.8	42	OSMSD18L
ø 2.3mm Twist Drill Short	ø 2.3	32	OSMSD23S
ø 2.3mm Twist Drill Long	ø 2.3	42	OSMSD23L

- Laser markings on lance drill corresponding to the implant length (8/10/13/15mm) , drilling only the cortical bone is recommended; enables drilling up to the laser marking line depending on the surgeon's preference



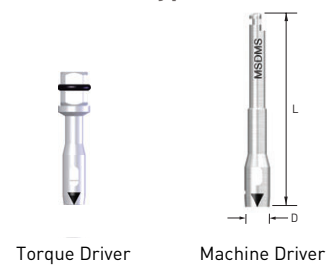
Driver for Narrow Ridge & Provisional Type



Name	D	L	Code
Torque Driver (Short)	∅ 3.4	16.5	MSPTS
Torque Driver (Long)	∅ 3.4	21.5	MSPTL
Machine Driver (Short)	∅ 3.4	24.4	MSPMS
Machine Driver (Long)	∅ 3.4	29.4	MSPML

- Special-purpose driver for MS Implant (Narrow Ridge and Provisional)
The triangle mark is used by aligning the driver with the implant cross section

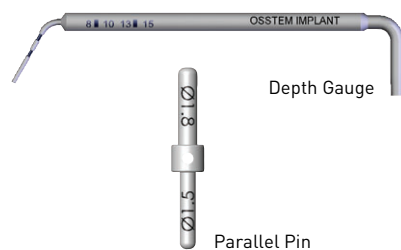
Driver for Denture type



Name	D	L	Code
Torque Driver (Short)	∅ 3.8	13.5	MSDTS
Torque Driver (Long)	∅ 3.8	18.5	MSDTL
Machine Driver	∅ 3.8	21.4	MSDMS

- Special-purpose driver for MS Implant (denture)
The triangle mark is used by aligning the driver with the implant cross section

Gauge for MS Implant



Name	Code
Depth Gauge	MSDG
Parallel Pin	MSPP

- Depth gauge
Left : For depth checking upon drilling
Right : Use for MS implant bending
- The parallel pin is used for path checking upon drilling.

Torque Handle



Code	MSTH
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- Use for manual torque after connecting to the connected part of a torque driver

Driver Separator

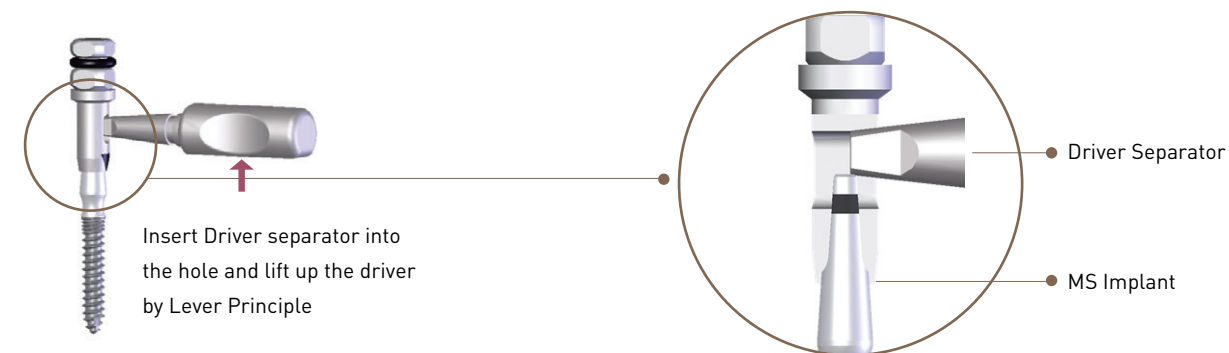


Code	MSDS
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- In case a driver is stuck during implantation, the Driver Separator helps remove the driver based on the lever principle (inserting Driver separator into the driver groove)

Warnings & Procedures

How to separate driver when pinching occurs during insertion



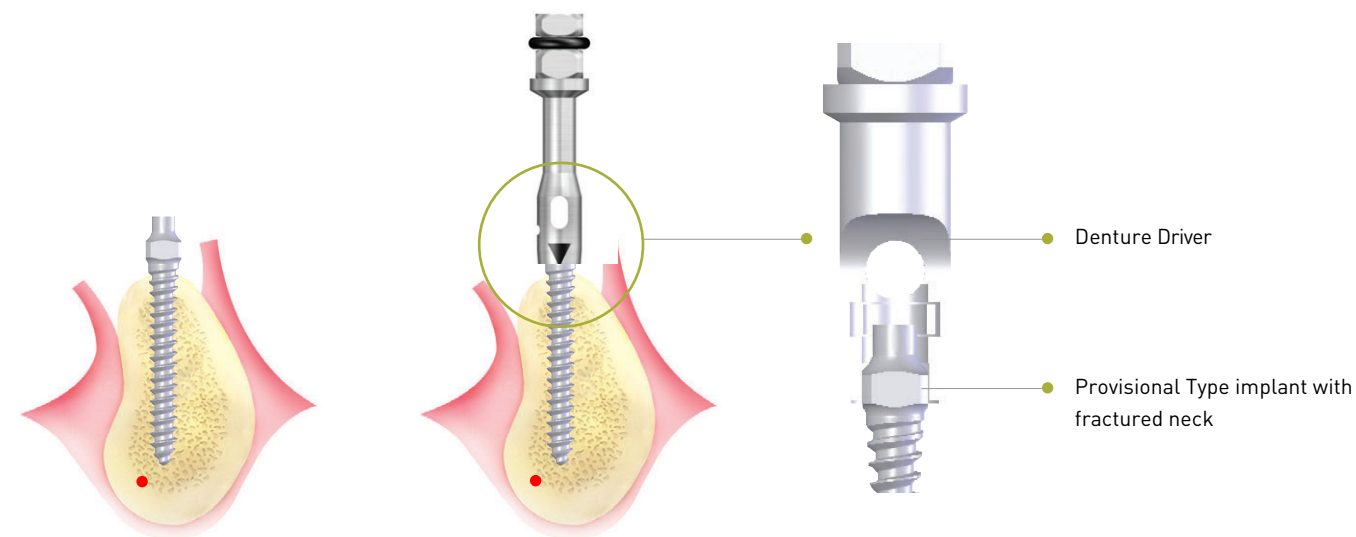
Insert Driver separator into the hole and lift up the driver by Lever Principle

How to recover Provisional Type Path



Correct the Path by using Depth Gauge.
Fracture of Implant Neck can be occurred in excessive bending.

How to remove implant when fracture occurs in Provisional Type



When the neck fractures.

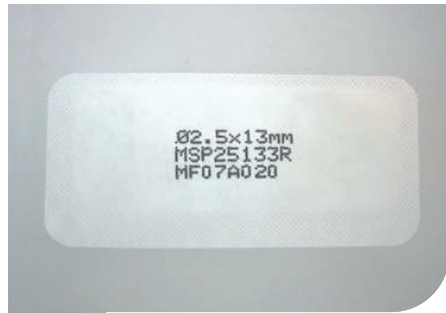
Connect denture driver to provisional implant.
Rotate the driver counter-clockwise to remove

● Warnings & Procedures

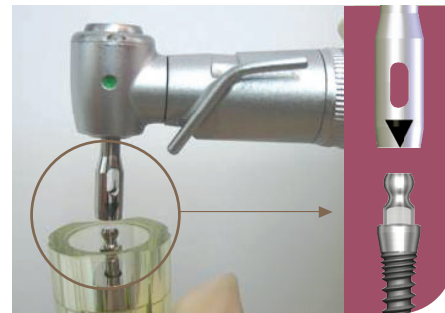
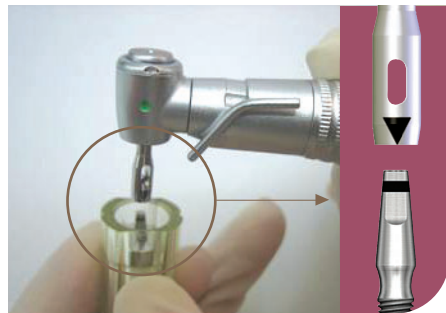
1. Push the dotted line at the top of the package with hands. The package includes a MS implant, manuals, and chart stickers.



2. The implant is sterilized before it is placed into the blister package. Diameter, length, product code number and Lot number are written on the back of the package.



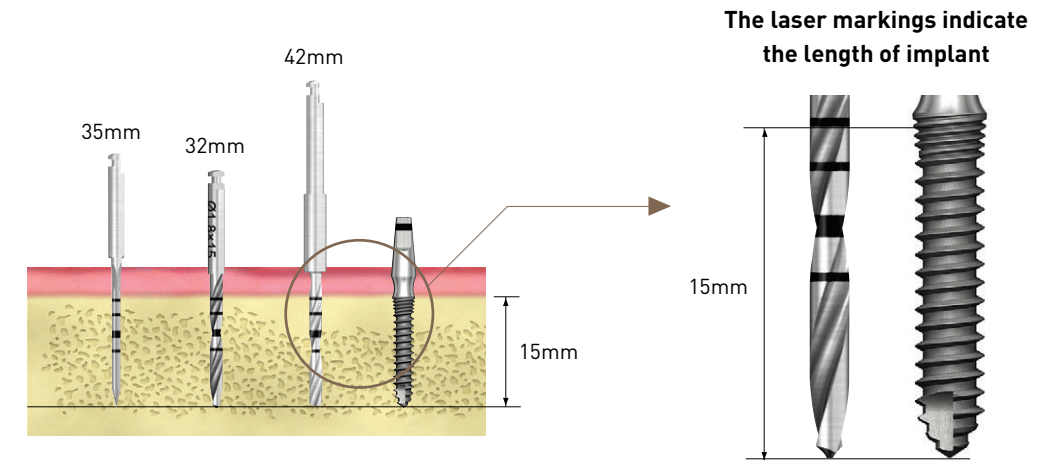
3. Remove the cap and the abutment part is exposed. Align the arrow mark on the driver with the cross section of the implant when you connect it. If a secure connection is not made, try again.



4. Take the implant out of the ampule and move it cautiously as the picture shows. Avoid contact with any objects and dropping the implant.



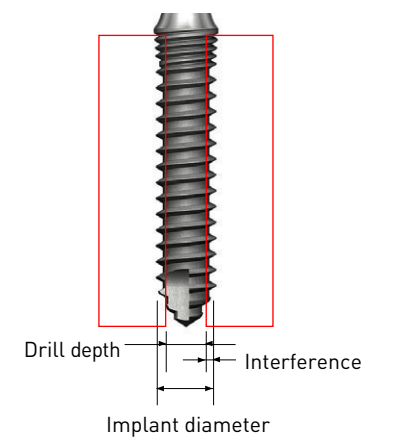
● Product Information



Diameter of implant and final drill

Final Drill	Implant Diameter	Interference	Recommendation
Ø 1.5	Ø 1.8	-	Drilling the length of cortical bone
Ø 1.5~1.8	Ø 2.5	0.35~0.5	Drilling the length of the implant
Ø 1.8~2.3	Ø 3.0	0.35~0.6	Drilling the length of the implant

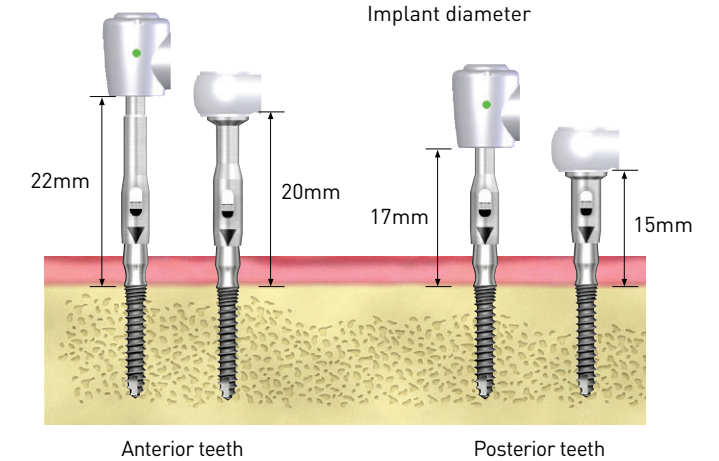
** The harder structure is, the larger the diameter of final drill should be.



Driver selection guide according to location

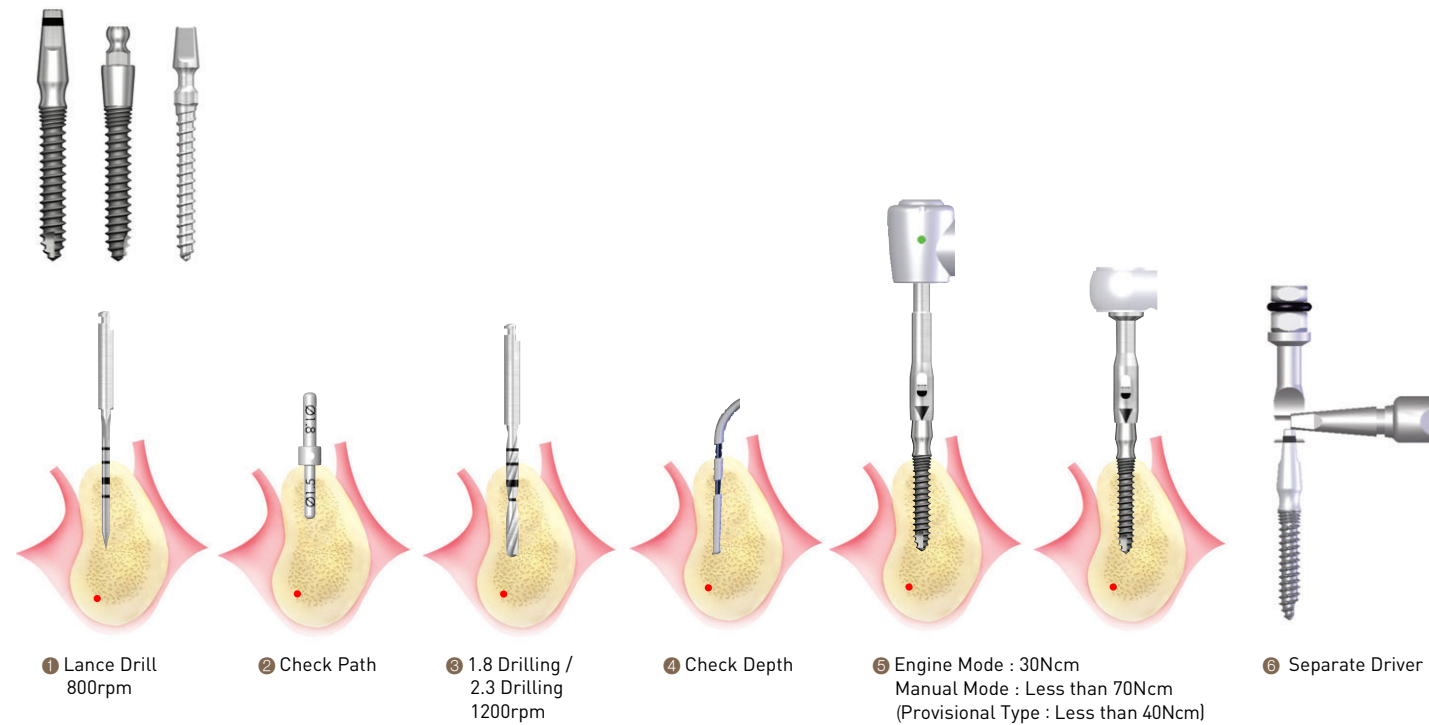
Location	How to use	Recommendation
In case of high crown (Anterior teeth)	Engine	Long Type Driver
	Hand	Long Type Driver
In case of narrow occlusal space (Posterior teeth)	Engine	Short Type Driver
	Hand	Short Type Driver

* Recommendations : 25 rpm, 30Ncm
(Provisional Ø 1.8 : 25Ncm)

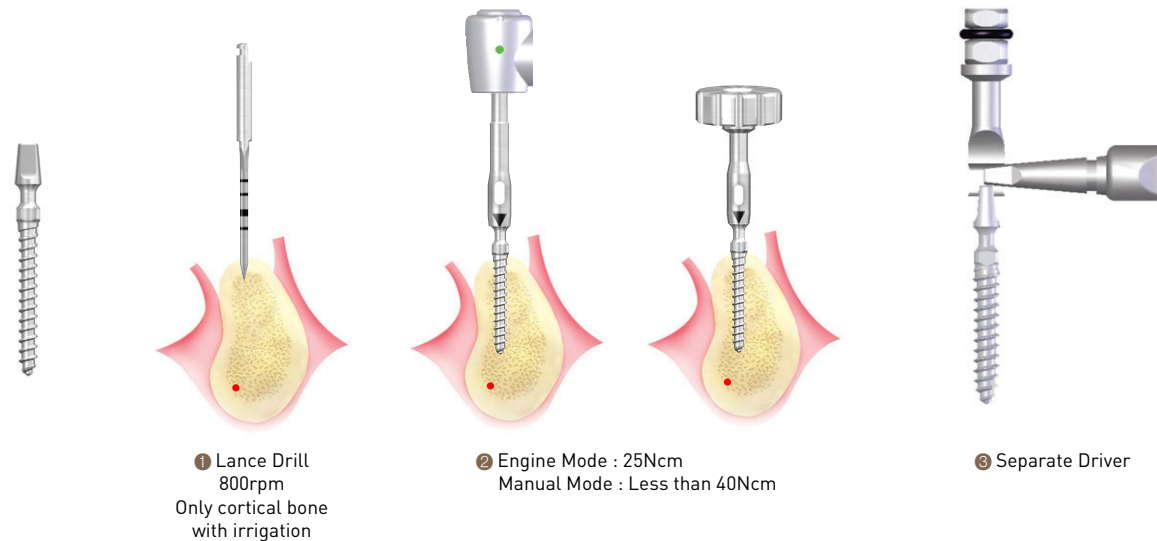


Recommended Surgical Procedure

MS Implant (ϕ 2.5 / ϕ 3.0) _ Recommended insertion torque : 30Ncm



MS Implant (ϕ 1.8) _ Recommended insertion torque : 25Ncm

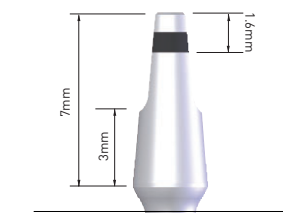


Caution :In Provisional Type, insert the implant by using Torque Handle(MSTH), otherwise, fracture of neck may be occurred when more than 40Ncm of torque value is reached.

MS Implant Prosthetic Procedure for Narrow Ridge

Step 1 : Temporary Restoration

1. Check vertical height, and path after MS implant insertion.
(Remove upper part of MS implant, using irrigation, if adjustment is necessary.)
2. Fabricate and place provisional prosthetics by using temporary cap.



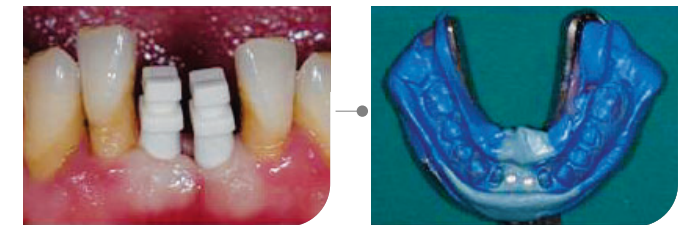
- Make adjustment considering length of upper marking line, and accurate prosthetics manufacturing using lab analogue is possible.
- Shaping individual margin is possible in the 3mm margin area of the MS implant.



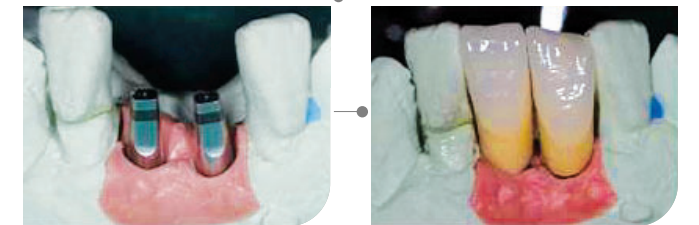
Step 2 : Impression & Working Cast

[When abutment is not made]

1. Place an impression cap on the implant.
2. Take an impression
3. Send impression and lab analog to lab for manufacturing of prosthesis



When the abutment is modified.
Take a direct impression.
Send to lab for manufacturing of prosthesis



When only abutment height was adjusted.
Place an impression cap on implant.
Take an impression, send impression and lab analog to lab for manufacturing of prosthesis

Step 3 : Setting

Place prosthesis in mouth check occlusion



● MS Implant Prosthetic Procedure for Provisional ↙

Step 1
Manufacture a temporary prosthesis on the model.

Step 2
Insert Provisional Implant between the implants.

Step 3
Check and control the Path of Provisional Implant.

Step 4
Confirm the space where Provisional Cap can be inserted on the temporary prosthesis.

Step 5
Connect Provisional Cap in the mouth.

Step 6
After covering with a Rubber Dam, connect Provisional Cap and temporary prosthesis using Resin.

Step 7
Remove the surplus resin and adjust occlusion after Resin hardens.
Set the temporary prosthesis using Temporary Cement.

● MS Implant Prosthetic Procedure for denture ↙

A. For new denture

Step 1
Insert Black O-ring in the Retainer, place the retainer on the Ball Head exposed in the mouth and take an impression.

Step 2
Connect Lab Analog to the retainer in the impression

Step 3
After manufacturing the working model, remove the Retainer from the impression according to the general rules.

Step 4
Using the completed working model, manufacture Denture according to the general rules..

Step 5
Check the insertion points of the denture

Step 6
Push the O-ring through the rubber dam. Insert the yellow o-ring into the retainer. Attach the retainer to the o-ring abutment.

Step 7
Inject Resin into the Hole formed on Denture and remove the surplus after Resin has hardened.

Step 8
Check the bearing and occlusion status.

● MS Implant Prosthetic Procedure for denture ↙

B. Using existing denture

Step 1

Considering Path, insert MS Implant according to the set surgery procedure.

Step 2

After checking the location of insertion, form the Hole on the existing denture.

Step 3

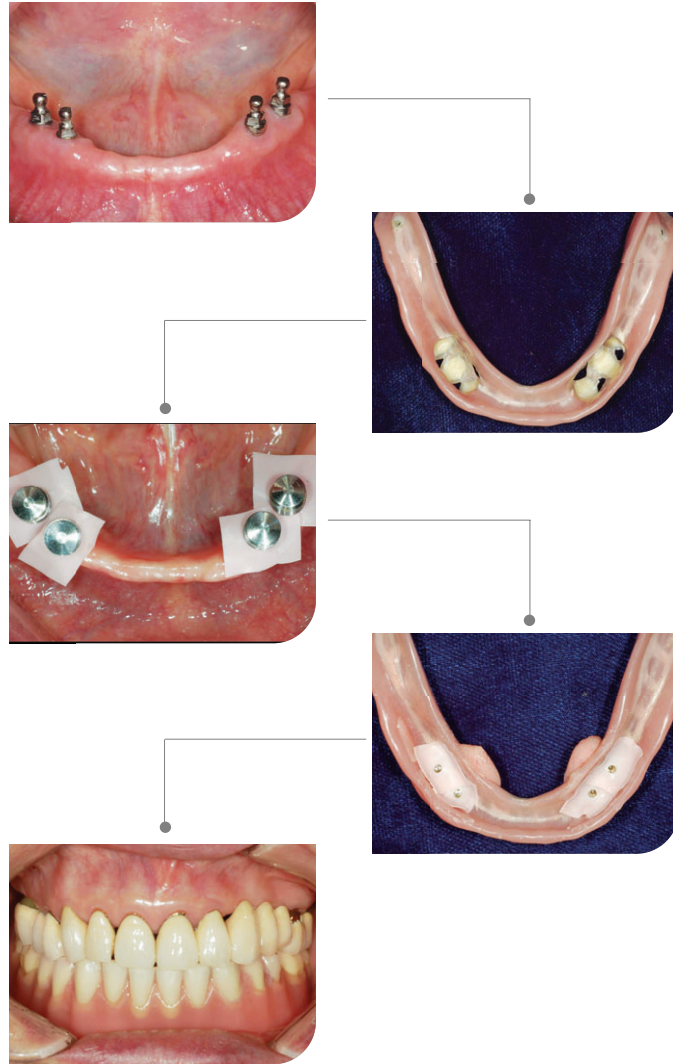
Connect Rubber Dam and then connect Ball Head by inserting O-Ring with weak bearing into the Retainer.

Step 4

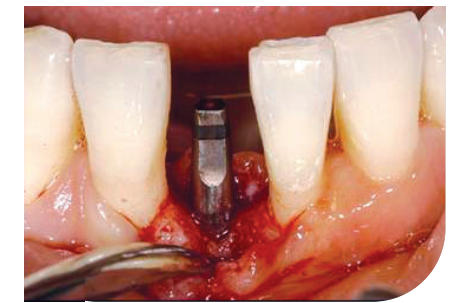
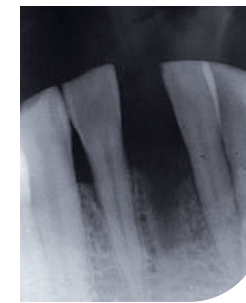
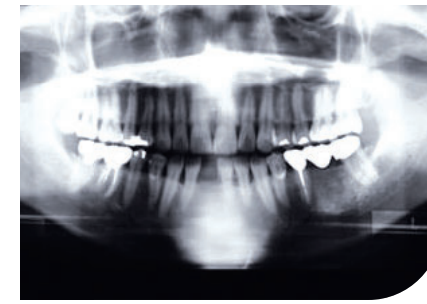
Inject Resin after setting the existing denture formed Hole. Remove the surplus part after Resin has hardened.

Step 5

Check the bearing and occlusion status.

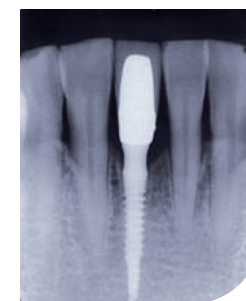


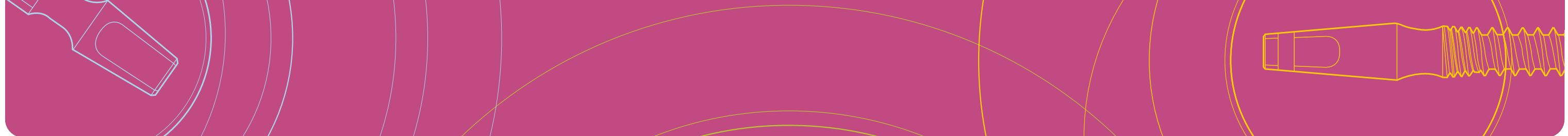
● Clinical Application using MS Implant ↙



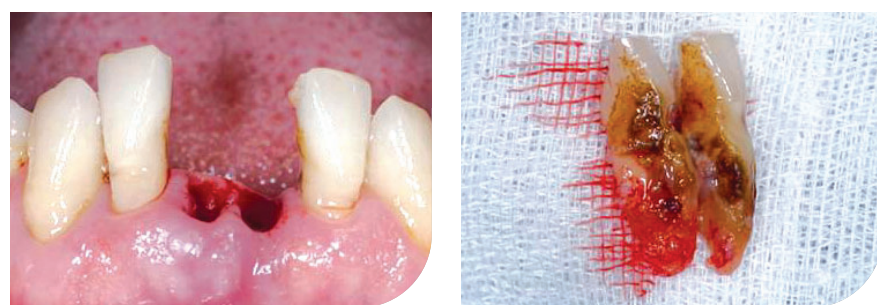
MS Narrow Ridge

- PatientCondition: narrow ridge
- Final Drill : \varnothing 1.8
- Implant : \varnothing 2.5 x 13.0mm
- Bone Type : D3
- Torque Value : 17Ncm





● Clinical Application using MS Implant ↙



MS Narrow Ridge

- PatientCondition:
No more increase in bone volume
- Final Drill : \varnothing 1.8
- Implant : \varnothing 2.5 x 13.0mm
 \varnothing 2.5 x 13.0mm
- Bone Type : D3
- Torque Value : 17 / 15Ncm



● Clinical Application using MS Implant ↙



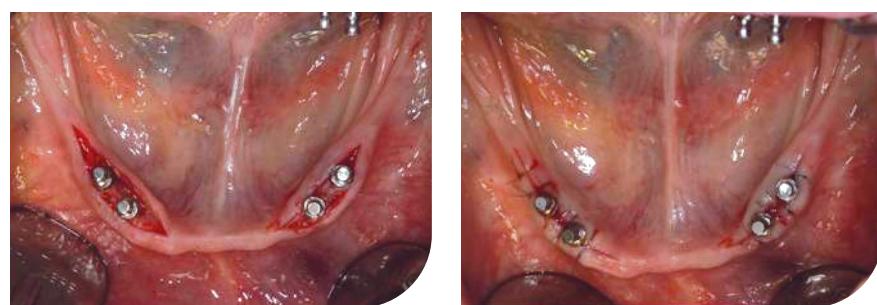
MS Narrow Ridge

- PatientCondition:
tooth extraction 2 weeks before surgery
- Final Drill : \varnothing 1.8
- Implant : \varnothing 2.5 x 13.0mm
- 골질 : D3



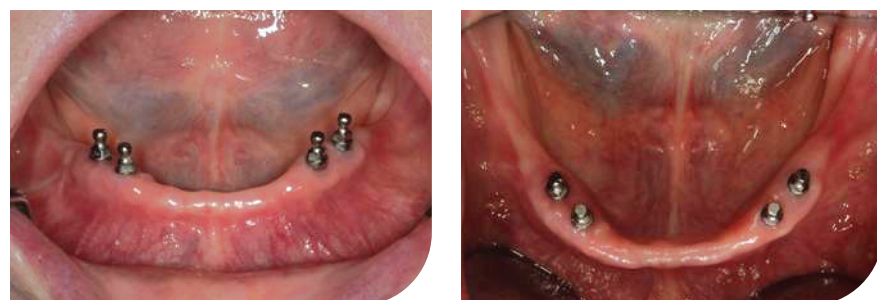


● Clinical Application using MS Implant ↙



MS Narrow Ridge

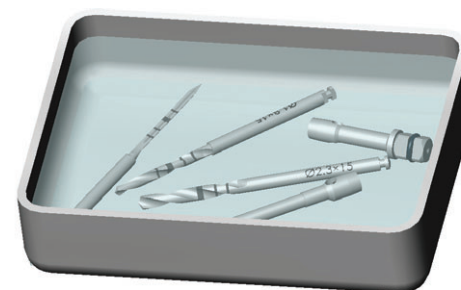
- **Patient Condition:** No more increase in bone volume
- **Final Drill :** \varnothing 1.8 / 2.3
- **Implant :** \varnothing 2.5 x 13.0mm
 \varnothing 3.0 x 13.0mm
- **Bone Type :** D3



● Washing and Sterilization ↙

How to maintain & Store surgical instruments

1. Right after procedure, surgical instruments should be soaked in sterilizing solution to prevent hardening of the blood. Wash with running or distilled water to completely remove blood and other remaining objects.
2. Dry with paper towel or heater. Put the instruments in sterilizing kit, and sterilize them for 15 minutes at 135° in Autoclave. Keep the sterilized instruments dry and store.



Soak surgical instruments in sterilization solution and wash in distilled or running water,



Remove water and disinfect for 15 minutes at 135°C in Autoclave.

● Surgical Procedure

The operator must check the following items before starting the surgery.

Patient's condition

- Sufficient bone volume and quality prior to treatment
- Smoking and/or drinking habits
- Status of oral hygiene
- Patient's understanding of implant surgery
- Detailed health status
- Masticatory pattern and habit
- Psychological state

Treatment Plan

Discuss treatment options with your patient. Include the pros and cons of each treatment as well as the procedure involved.

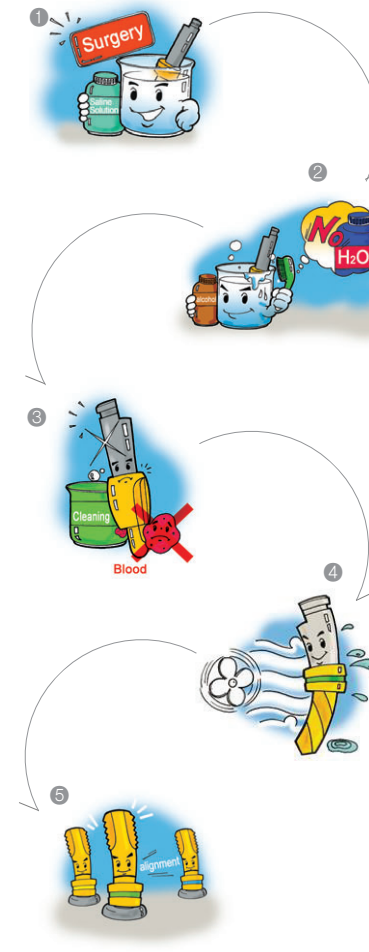
Medical Diagnosis

Check the patient's health history before implant surgery. Discuss the treatment plan and health history with the patient's primary care physician before performing surgery.

Pay Particular Attention to the Following during an Implant Procedure

- Improper upper/lower posterior height
- Extremely poor bone quality
- Ischemic heart patient (angina, myocardial infarction)
- Patient's distrust of implant treatment
- Improper lower anterior width
- Congenital or acquired heart conditions
- High blood pressure

● How to Maintain Surgical KIT



- ① During surgery, be sure to keep used tools in saline or distilled water.
- ② Rinse tools with distilled or running water to remove all blood and debris.
- ③ Alcohol wash all tools used in surgery
Caution: Do NOT use hydrogen peroxide
*Exposure to hydrogen peroxide may cause discoloration to laser markings and/or TiN coating
- ④ Remove all moisture with a dry cloth or warming fan
- ⑤ Replace dried tools into the Kit case
(Refer to the color-coding for easy placement.)
- ⑥ Autoclave Kit for 15 minutes at 132, then store at room temperature.

Precautions | Immediately after surgery separate, wash and store all tools.
Re-sterilize Kits prior to surgery (132 for 15 minutes)
Hanaro Kits have a 1 year product warranty (after opening); all drills and drivers are recommended for up to 50 uses.