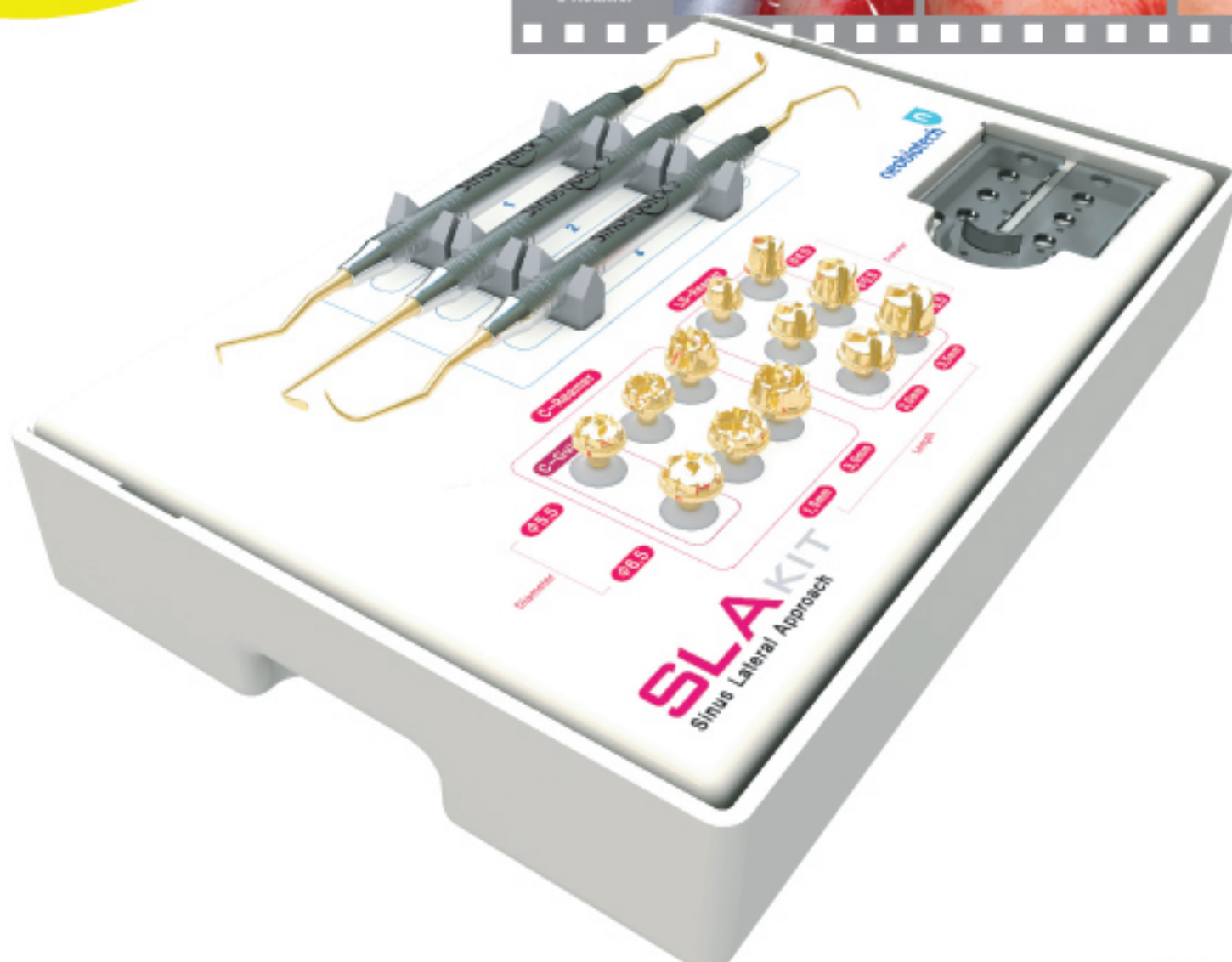
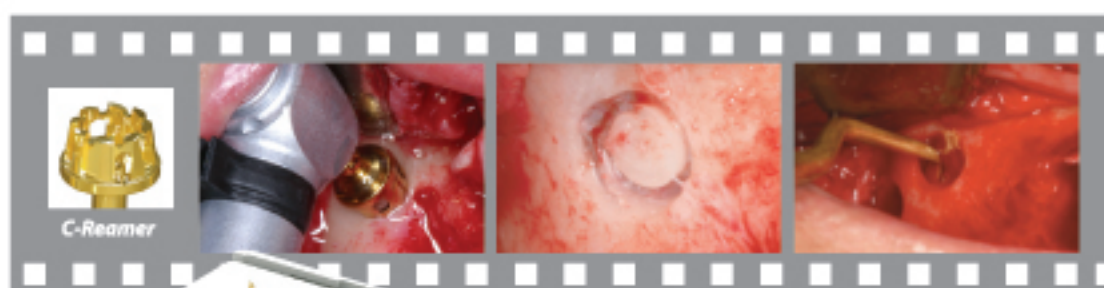
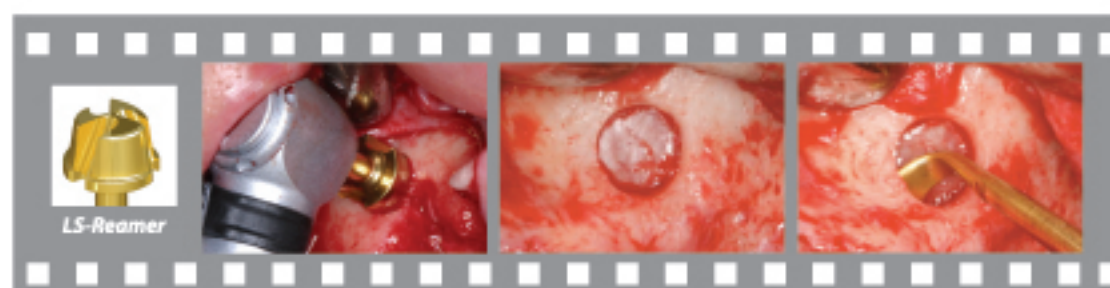
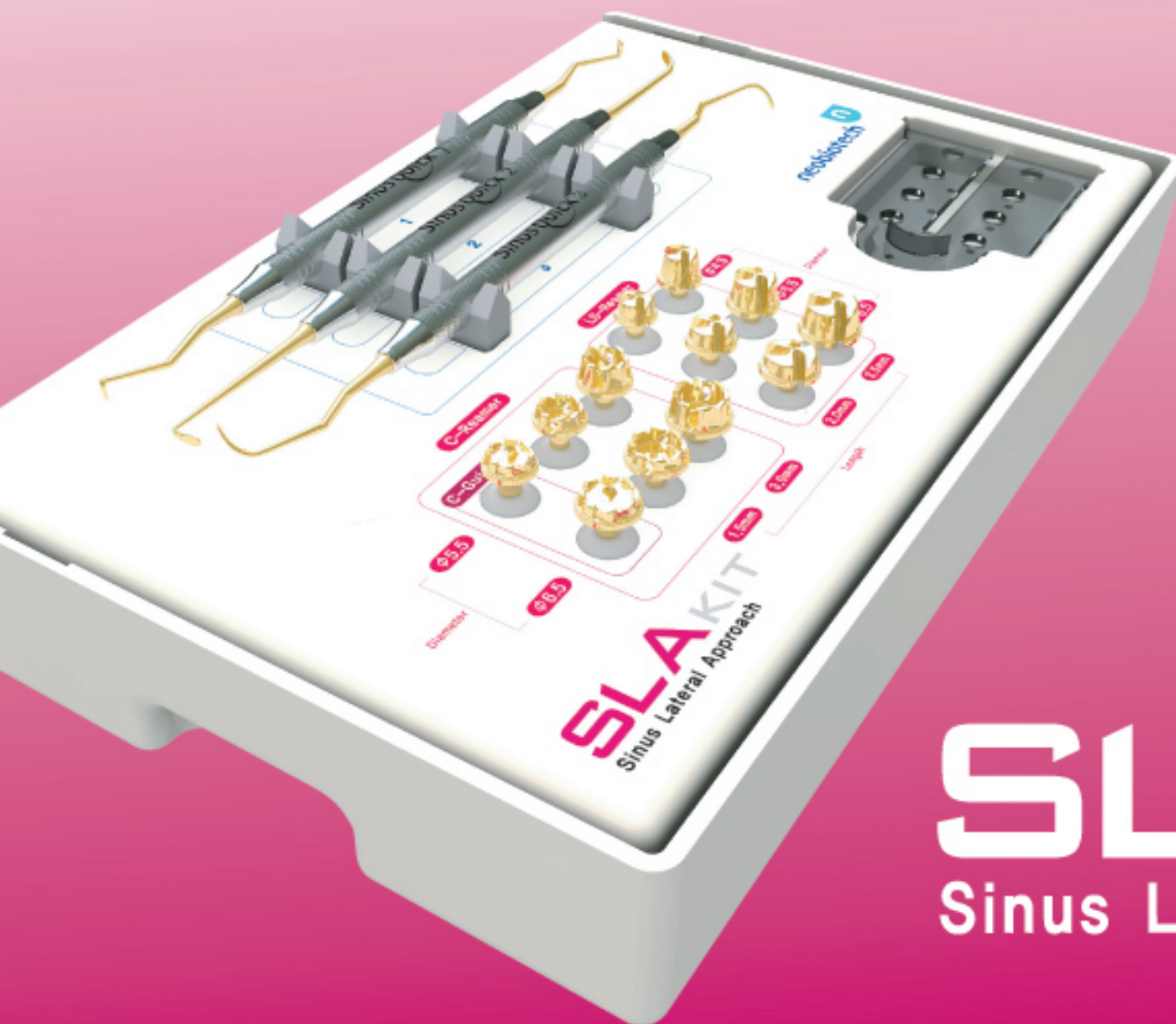


SLAKIT

Sinus Lateral Approach

User Guide





SLAKIT

Sinus Lateral Approach

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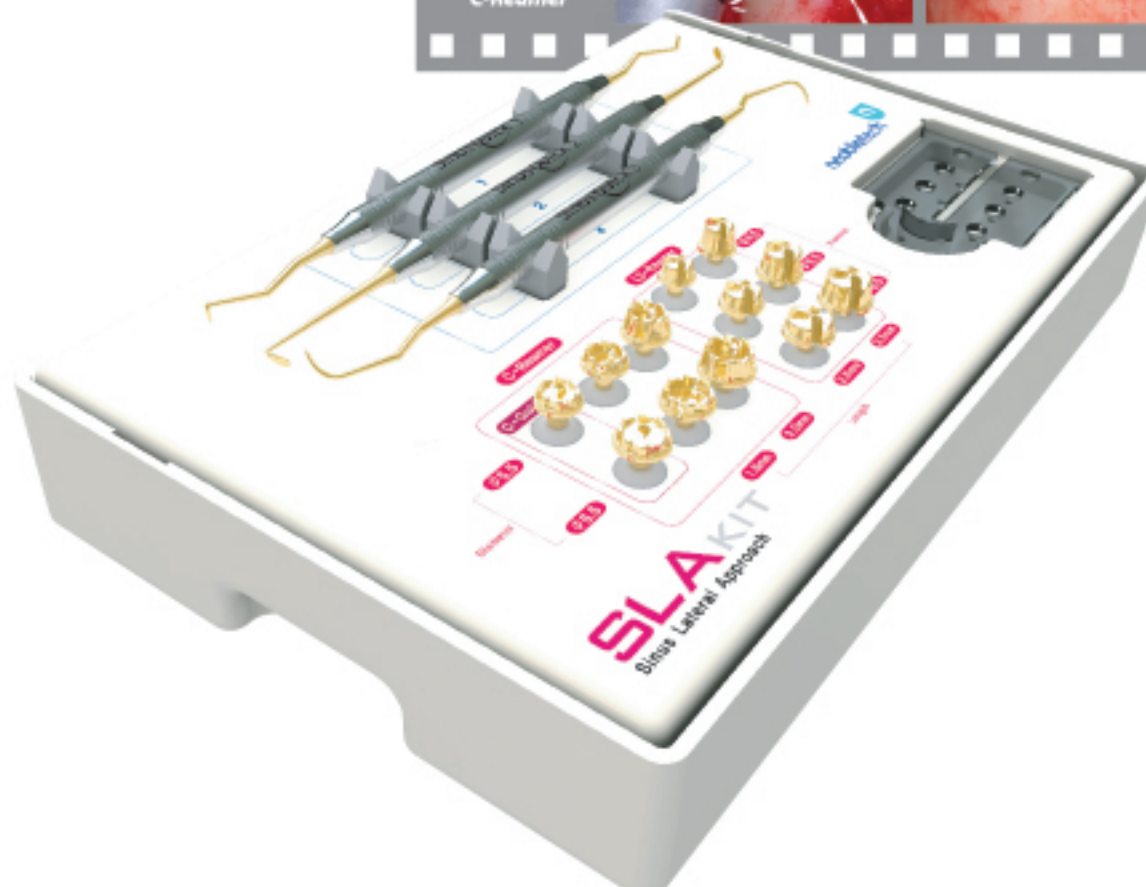
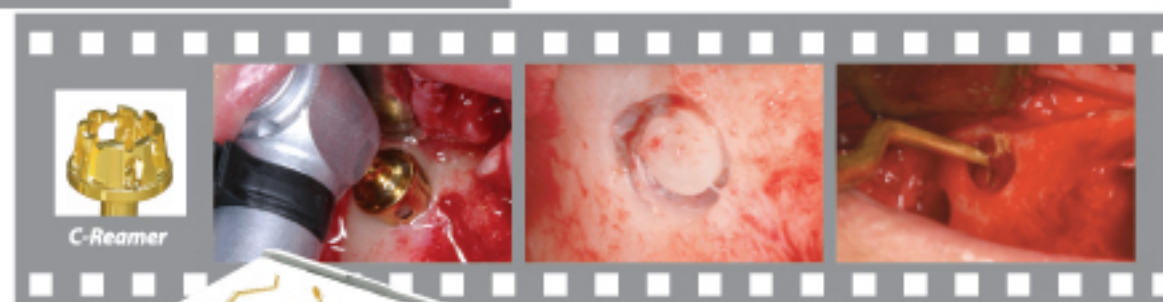
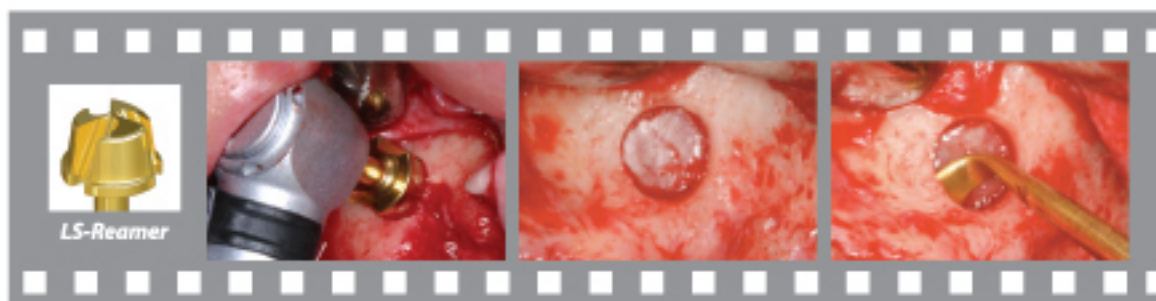


Introduction

SLAKIT Sinus Lateral Approach

Lateral window technique is the formation of the access to the maxillary sinus through its lateral wall. The access is used to elevate the Schneiderian membrane for the placement of a bone graft material in the sinus through the prepared window opening. The SLA kit is a newly and uniquely designed surgical kit to make much easier, safer, and quicker lateral window opening for the maxillary sinus than conventional window opening methods. SLA kit offers several unique features. It is expected to solve various problems of conventional lateral approach such as formation of inevitably wide flap and window opening, the difficulty in use of the straight handpiece and round bur, artery bleeding, membrane rupture, and swelling and pain. The LS- and C-reamer, the main components of SLA kit is the tools to form a round window on the sinus lateral wall. The taper-shaped trunk of the reamers prevents the sinus from the rupture caused by abrupt drilling.

The process using this tool is simpler and much comfortable than any other techniques. Above all, this surgical kit provides ultimate solutions for the cases of only having with a thin residual bone height which is difficult to approach with a crestal technique, membrane rupture by a sinus crestal approach or placing a multiple implants. In addition, SLA reamers can be easily adapted for the case of formation of minimum flap size on the inferior wall



SLA Kit Composition



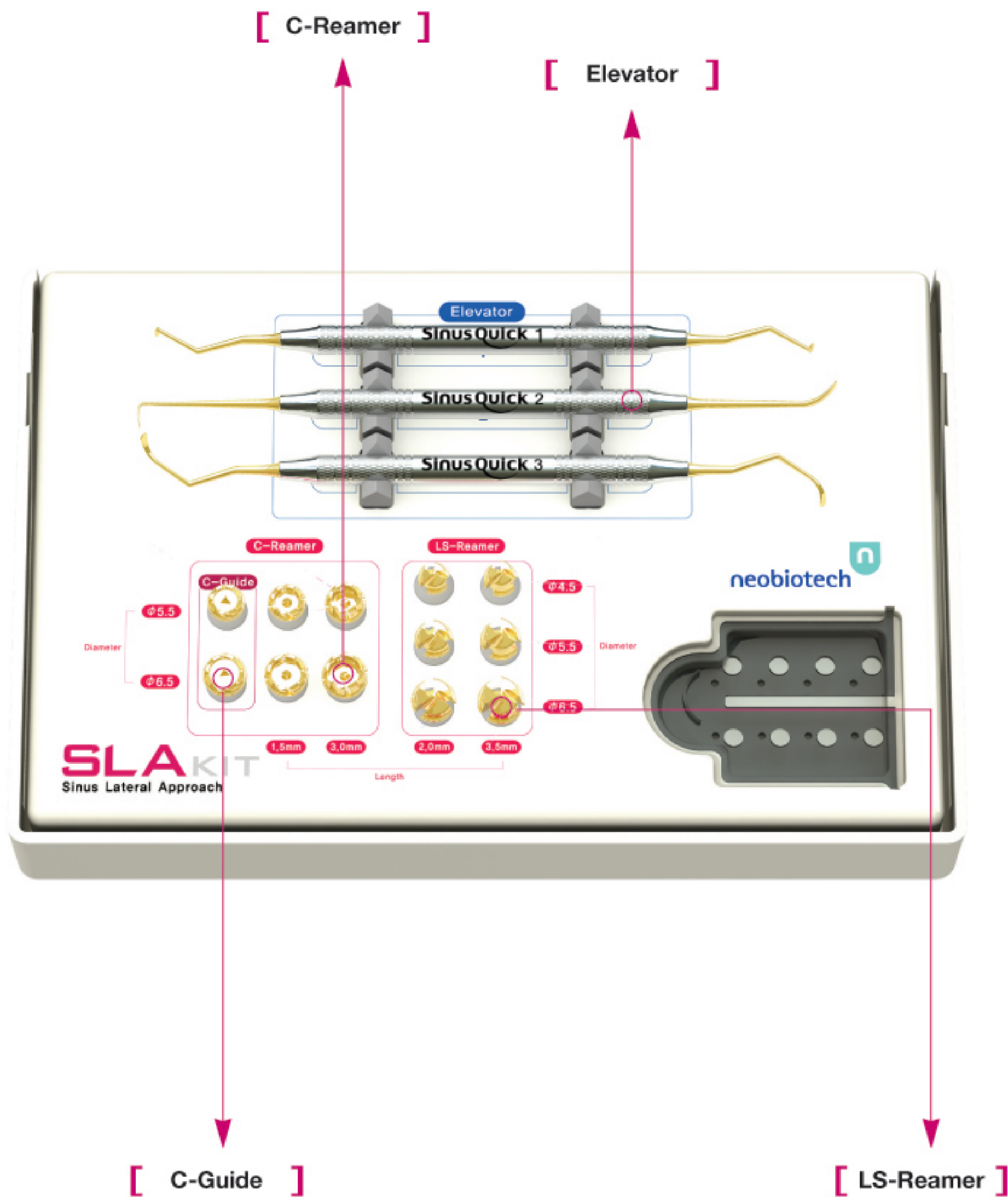
SLA technique resolves seven burdens of the existing sinus lateral approach.

1. Burden in having to extensively open flap
 - ▶ SLA-KIT allows surgical operation through small opening of flap.
2. Fear of forming a very large window
 - ▶ A safe approach is possible without forming big window.
3. Burden of having to use straight handpiece and round bur
 - ▶ There is no burden of having to use straight handpiece or round-bur and minimizes membrane damage while forming window.
4. Fear of artery bleeding when forming window
 - ▶ It's safe as surgical operation can be performed while observing whether or not there is an artery.
5. Fear of tearing membrane when forming window
 - ▶ Minimized the risk of membrane damage through the forming of special blade of reamer.
6. Concern for swelling and pain from extensive surgery
 - ▶ Swelling and pain drastically reduces through the minimization of operational time and scope.
7. Lack of confidence in membrane elevation
 - ▶ The self-developed three types of elevator safely and effectively lift membrane.

SLA kit is a product that's been developed to resolve these burdens.



SLA Kit Composition



SLA Kit Components



1. LS-reamer

Two types of reamers (LS-reamer and C-reamer) are equipped in the SLA kit for alternative treatment in different cases. The LS-reamer is a drill to perforate the lateral hole without saving the bone core. It is also designed not to tear the sinus membrane.



◆ LS-Reamer's Merits & Features

1. The tapered trunk of LS-reamer is designed to control the drilling depth without using stoppers.
2. The LS-reamer mounted on a handpiece can be operated with high speed of 2,000 ~ 10,000 rpm under sufficient irrigation.
3. The reamer filled with bone chip protects the membrane from tearing.
4. It provides the safe surgery because it is able to check an artery or septum etc. during the drilling process through the lateral hole.



2. C-Guide & C-reamer

The hollow spaced and tapered C-reamer can save the circular bone core disk from the lateral wall and to limit any abrupt movement of the reamer to forward direction, respectively. It is designed to provide a safe, speedy recovery, fast surgery and quick bone formation in the lateral hole.



◆ C-Reamer's Merits & Features

1. The bone core disk can be saved after drilling being used as the window cover before suturing.
2. With the tapered trunk of the C-reamer, the drilling depth can be controlled without using stopper.
3. The C-reamer cutting edges are positioned on the head and side of the C-reamer; therefore, it provides the high drilling efficiency. Typically, C-reamer can be operated a speed at 2,000 rpm. It is recommended that the bone core disk should be removed using elevators not to be excessively stuck to the C-reamer hollow space.
4. The four holes formed on the side of C-reamer are to provide irrigation line not to overheat during the drilling process.

SLA Kit Components

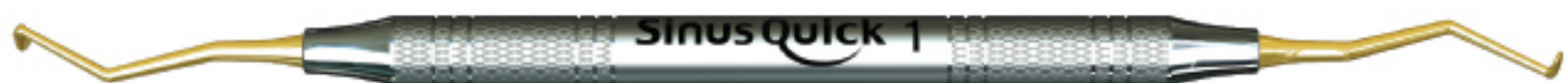


3. Elevator

The three elevators provided are designed to obtain a best angle and length for membrane elevation in buccal. These tools are used one after another in number.

1. Elevator 1

The elevator #1 is designed as the initial membrane elevation of mesial and distal, after making a lateral hole.



2. Elevator 2

The elevator #2 has two functions. At the one end, the “L” shape is used to detach the sinus membrane from a lower part of lateral wall. At the other end, another shape is used to elevate the sinus membrane from sinus floor, medial wall and posterior wall.



3. Elevator 3

This is designed to detach the membrane from the remaining part and deep site in sinus.





SLA Kit Components

Simultaneous applications with LS-Reamer and C-Reamer

As the LS & C-reamer was designed for maximum 3.5mm drilling depth of the lateral wall, the required drilling depth may have been thicker than the reamer's length. In this case, it is required to remove a 2 ~3mm thickness bone core disk with C-reamer with $\varnothing 6.5$ in diameter 3.0mm in length, first. After removing the bone core disk by the chisel or periosteal elevator, then LS-reamer with $\varnothing 4.5$ in diameter can be used to make a lateral hole to all the way to the sinus.



Procedure

1. Get an accurate X-ray image of the residual bone height of the maxillary posterior area. It is necessary to get a CT image to obtain the detailed structure, artery status, and lateral wall thickness.
2. The SLA Kit is easily adapted to the cases of only 1~4mm of residual bone height, membrane tearing by the crestal approach, convex sinus floor or a number of implants placement.
3. It is often required to make only limited size of the lateral flap and vertical incision without forming a large flap. When approach the flapless surgery, a semilunar incision is good enough to form a lateral hole.
4. The LS-reamer can be used when it is required to care for the artery bleeding, septum existence on the drilling path or to make a lateral hole in the overlapped region of inferior cortical wall and cancellous bone layer. After bone grafting, the additional membrane may be needed to cover the hole.
5. The C-reamer's main purpose is to get the bone core disk from the lateral wall and to use as a cover of the lateral hole. If the bone core disk is not needed, you may select the LS-reamer to drill on the lateral wall.

Procedure



6. A formation of lateral hole is preferred to be positioned on the most anterior and inferior site as possible to prevent the membrane tearing and to elevate the membrane effectively. If there is no possibility to reduce the residual bone strength caused by drilling, it is recommended to make a lateral hole on the spot containing about 1mm inferior cortical wall.
7. To take an initial drilling position on the lateral wall, the drilling speed with 5,000 ~ 10,000rpm is required by the 1:1 contra-angle. If the reamer is mounted on 20:1 contra angle, drilling should be performed at maximum 2,000 rpm with a firm grip and vertical force on a handpiece to get a good stability.
8. The LS-reamer is requested to drill until the lateral wall is completely perforated. At this moment, the remaining thin bone layer, called Residual Bone Shield, will be formed, which may prevent the membrane tearing. When the artery appears during drilling in sinus, the other lateral approach at the lower site is recommended to make another lateral hole.
9. The C-reamer is designed to be safe when it is in contact with sinus membrane. However, since C-reamer has the blade on the head of the reamer, it is relatively less safe than the LS-reamer. Therefore, when the thickness of the perforated lateral wall is more than 3mm, the bone core can be removed by chisel or periosteal elevator through lever action. Then the remained portion of the lateral wall can be finished by the LS-reamer. No attempt should be made to remove the bone core disk by C-reamer all the way to the sinus. Keep the bone core in the wet gauze or saline solution and cover the hole after finishing the graft.
10. As mentioned on the above, use the elevator #1 ~ 3 in order to achieve membrane elevation.
11. Graft the bone material and place implant into the hole.



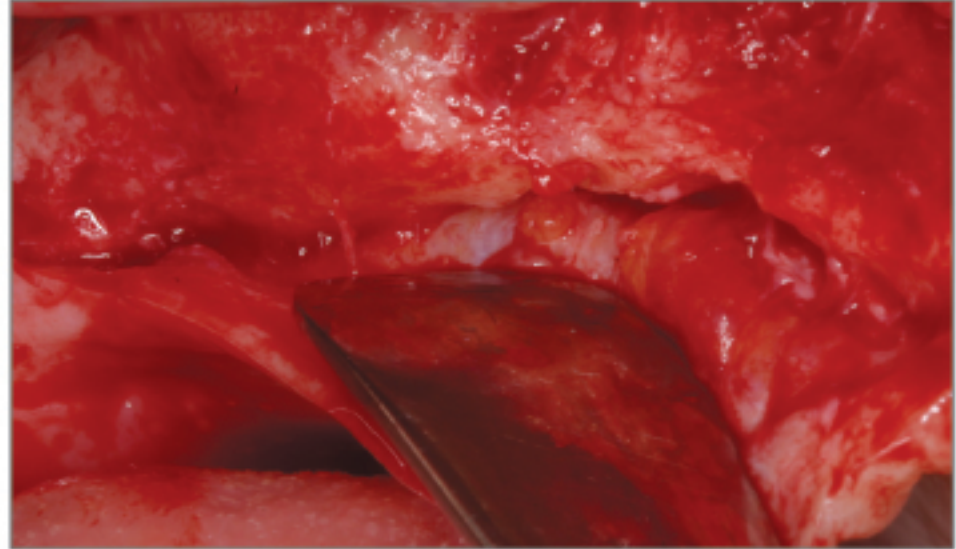


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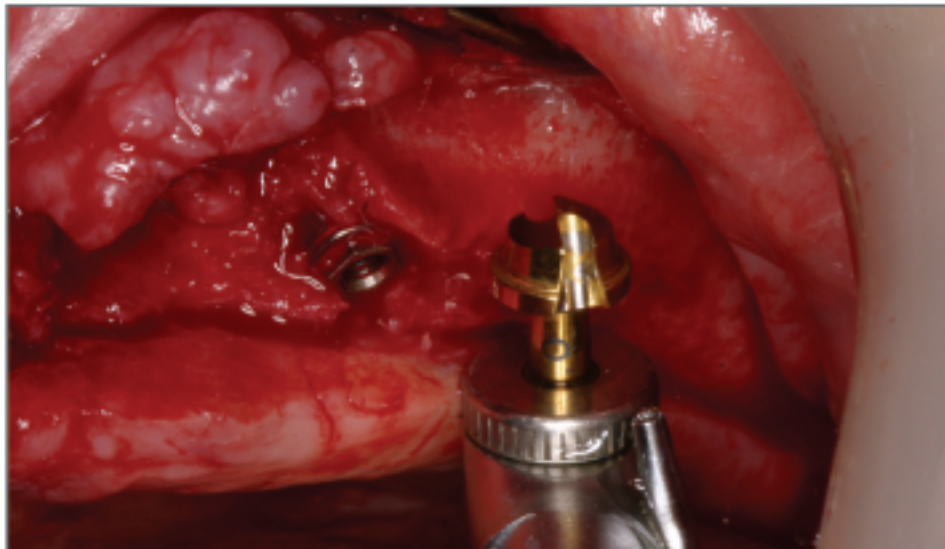
Case 1. (Residual bone height of 2 ~ 3mm)



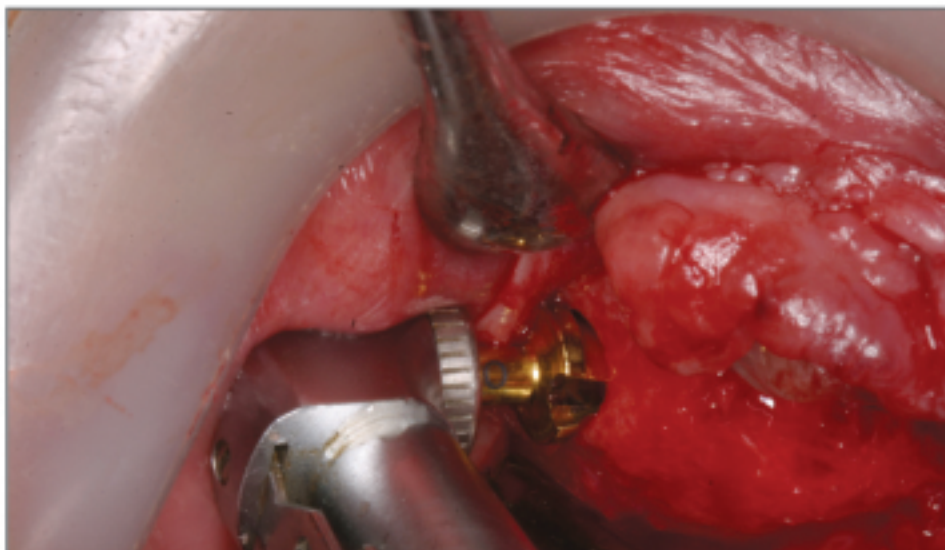
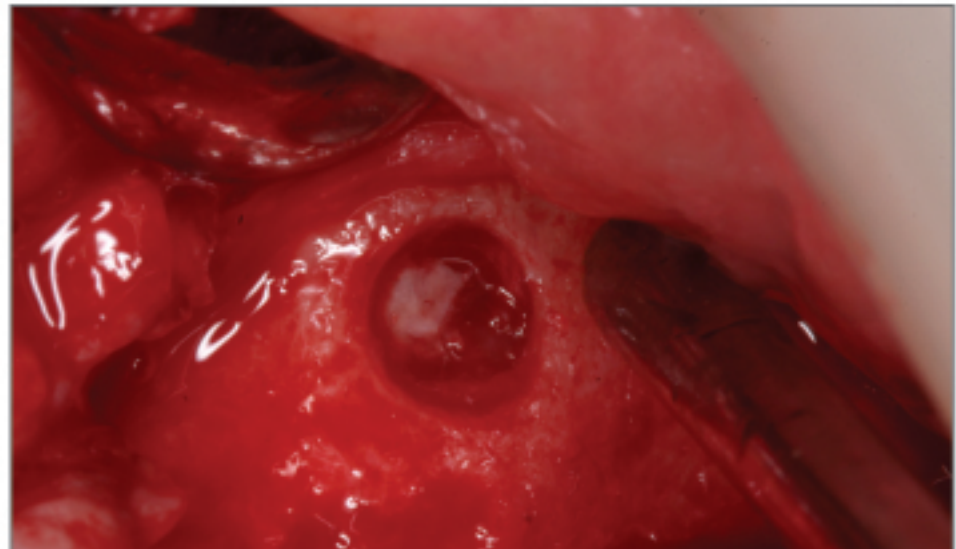
1. The residual bone height was approximately 2 ~3mm on #15, 16 & 26 sites.
The six implants will be placed by lateral approach.



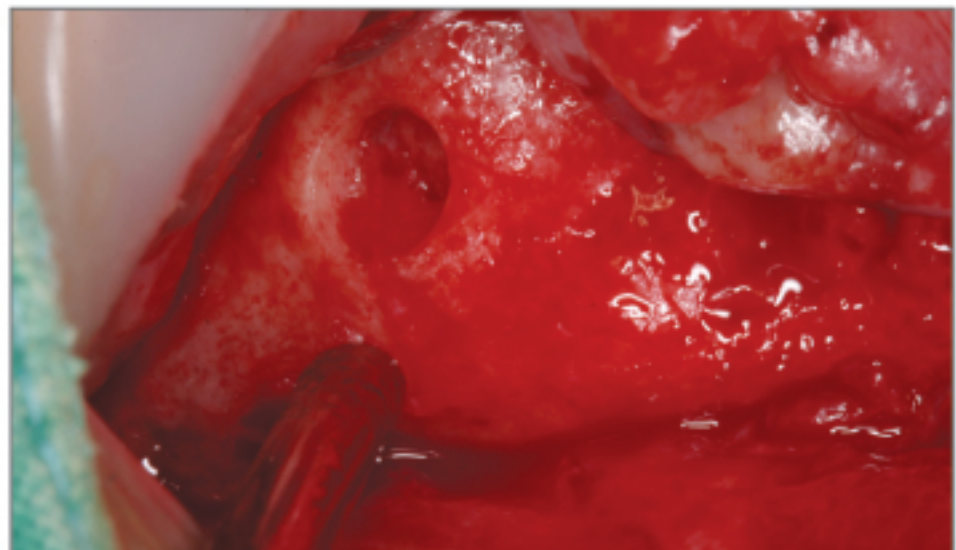
2. Make a minimal flap that is good enough to perform lateral window opening.



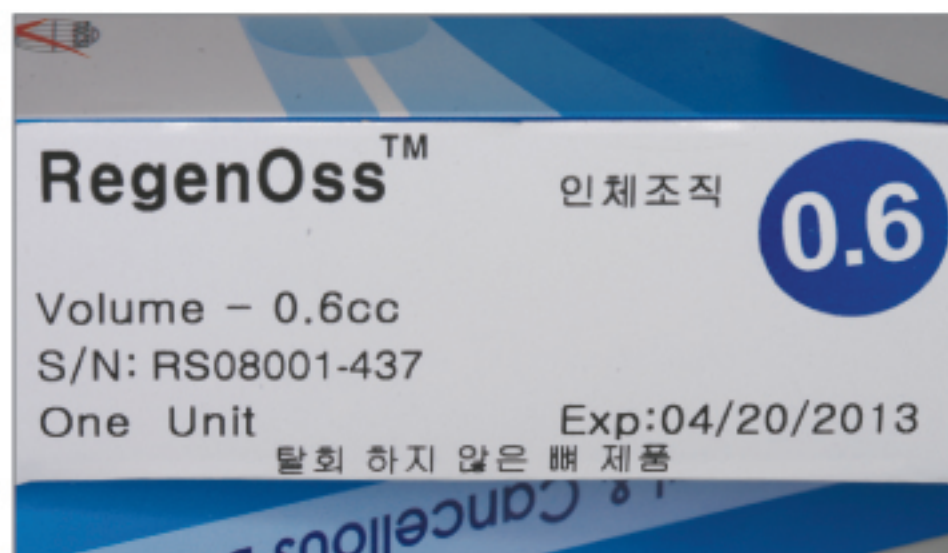
3. The lateral hole was made by LS-reamer on the upper side of inferior cortical wall on the #26 site.
The thin bone disk formed was separated from the membrane.



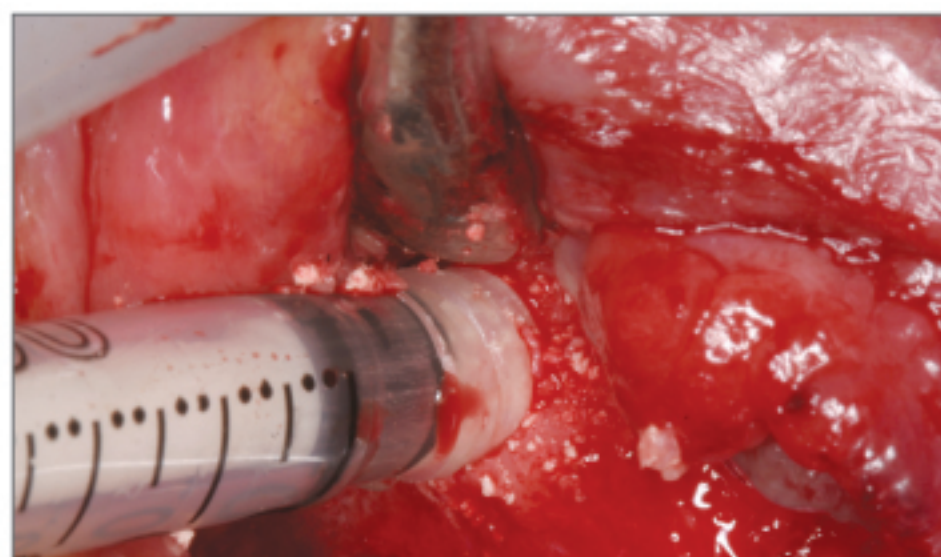
4. The lateral hole was also made by LS-reamer on the #16 site.



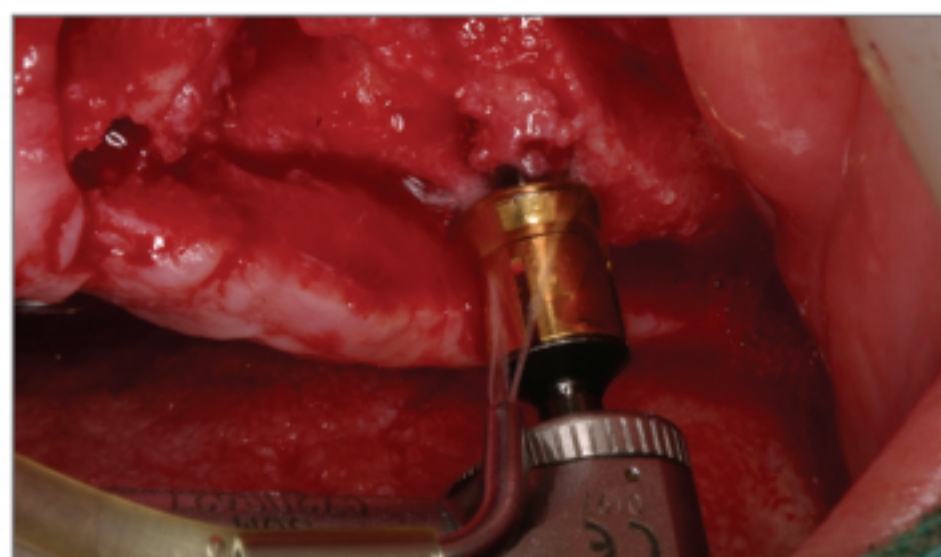
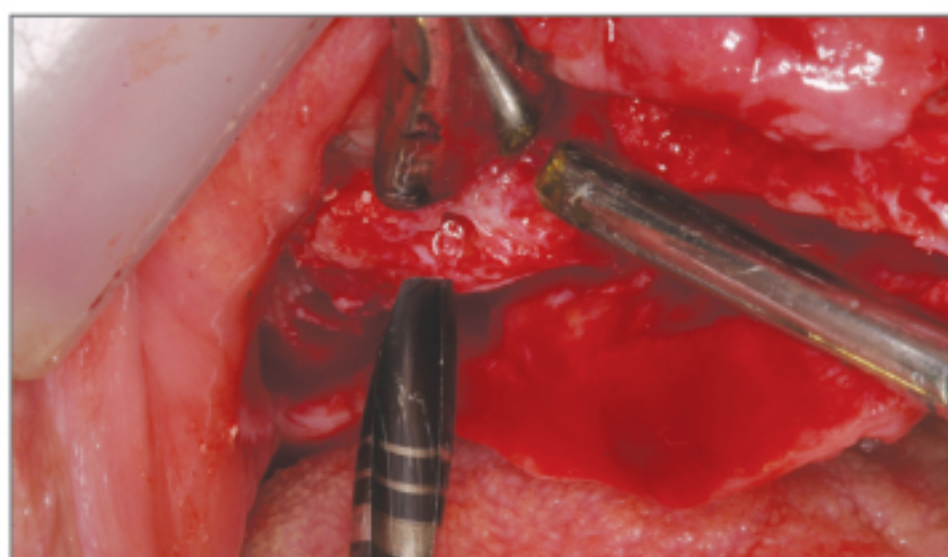
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5. The mixture of Regenoss (FDBA) and Calpore (BTCP60% + HA40%) was used as bone grafting materials.



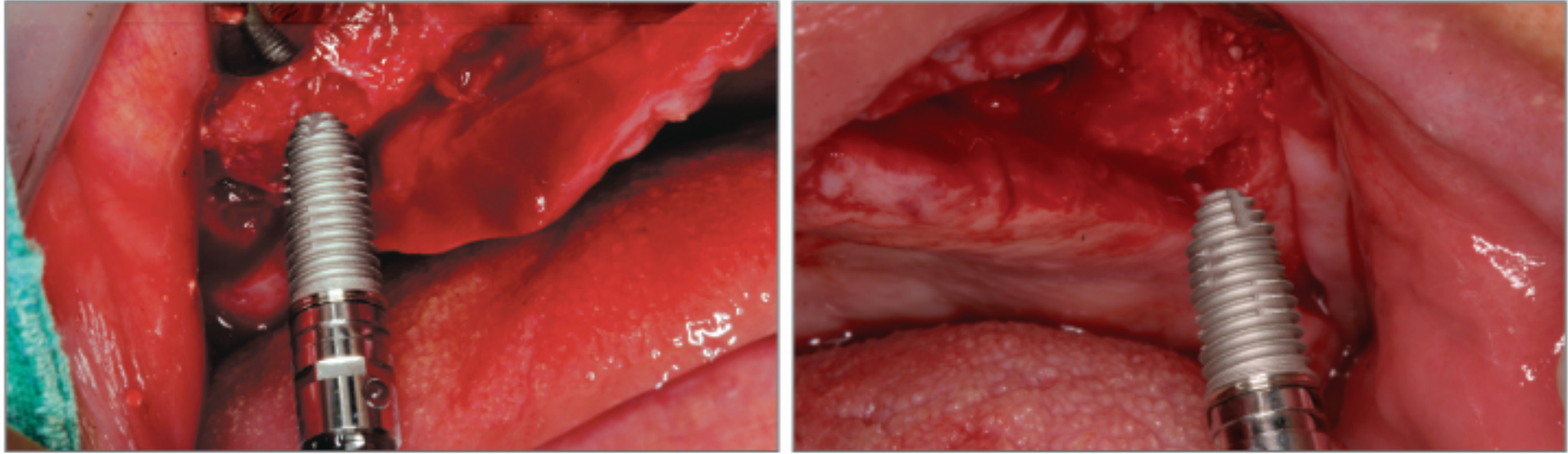
6. After elevating the membrane, place the bone graft material with a ratio 1:1 of Regenoss and Calpore using a syringe.



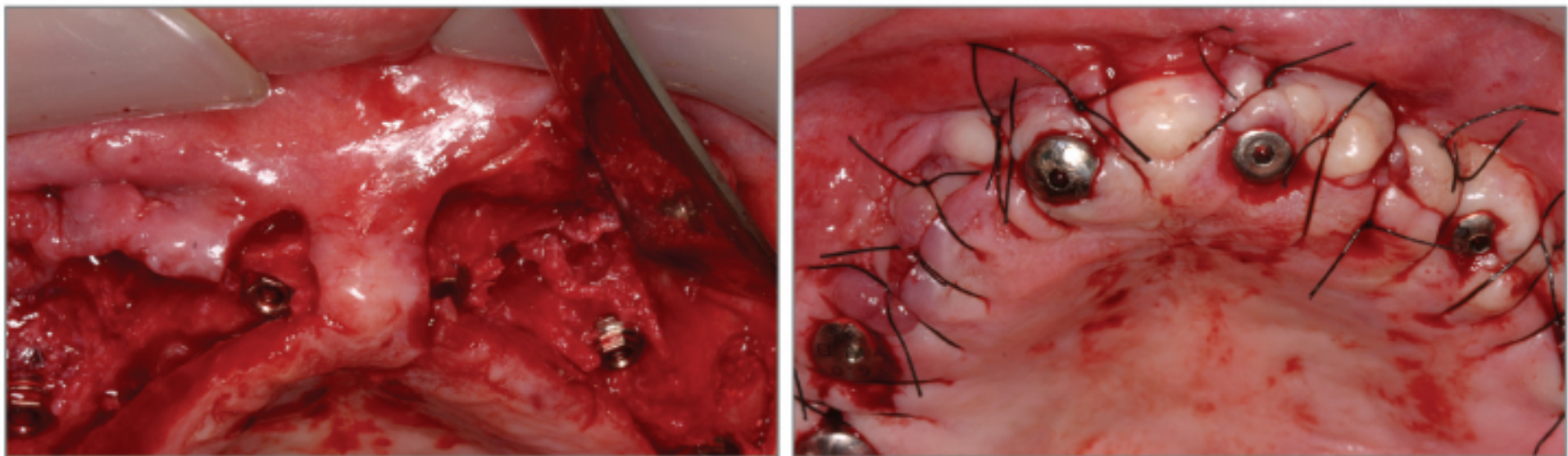
7. If the bone density is D3 - D4, the underdrilling is required.



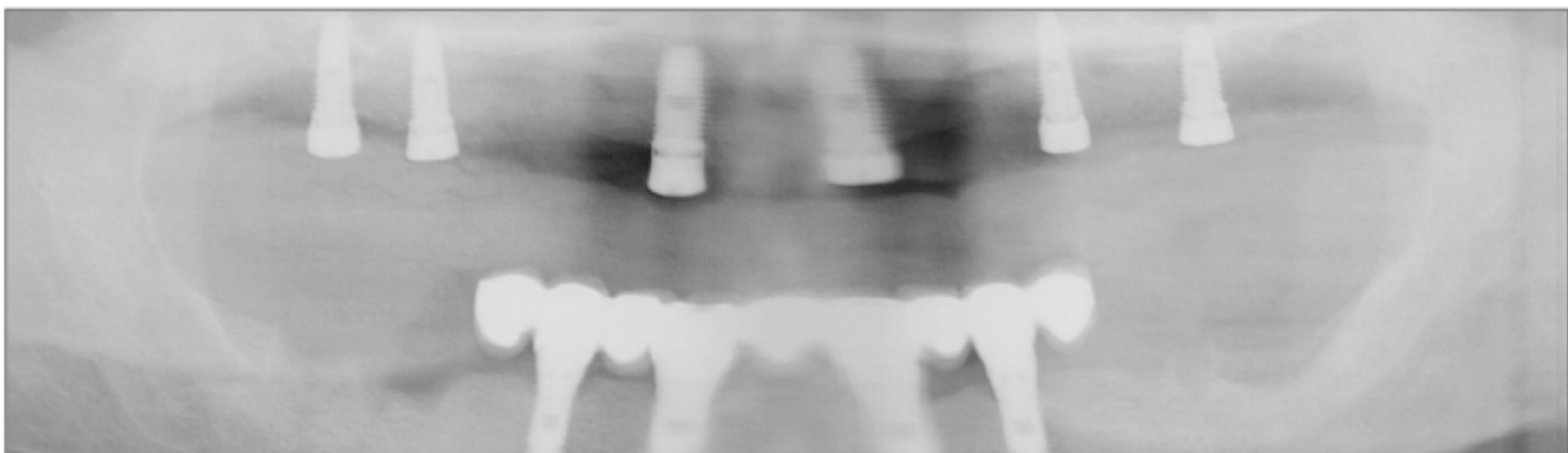
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8. Place the SinusQuick EB511 of an external implant which has a good initial stability.



9. After implantation of six fixtures with 30Ncm initial stability the one stage approach will be applied.

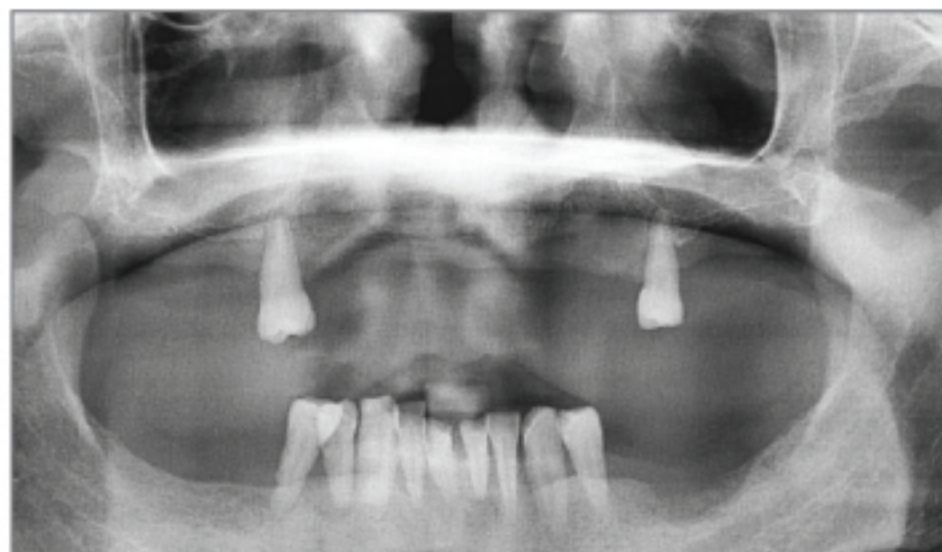


10. For the case of 1~3mm of the residual bone height, the prosthesis can be delivered about 6~10 months later.

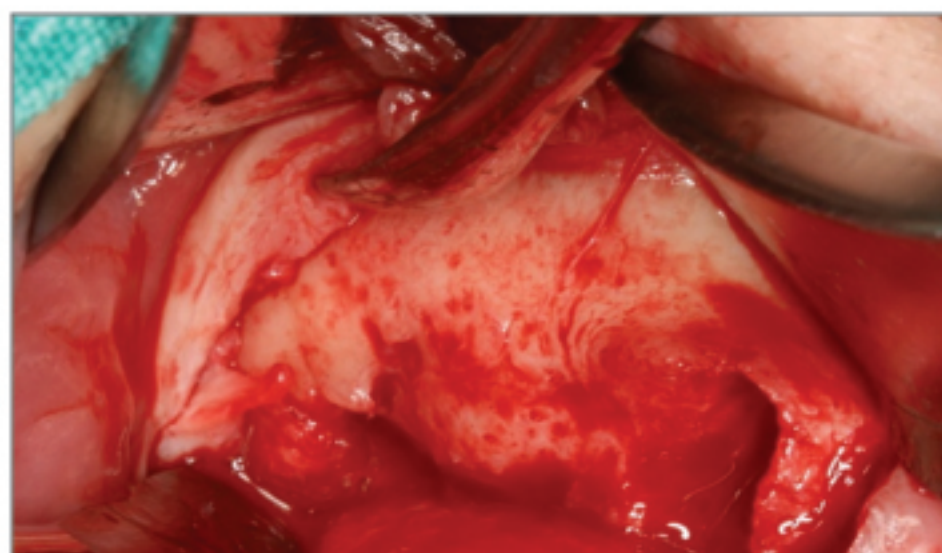
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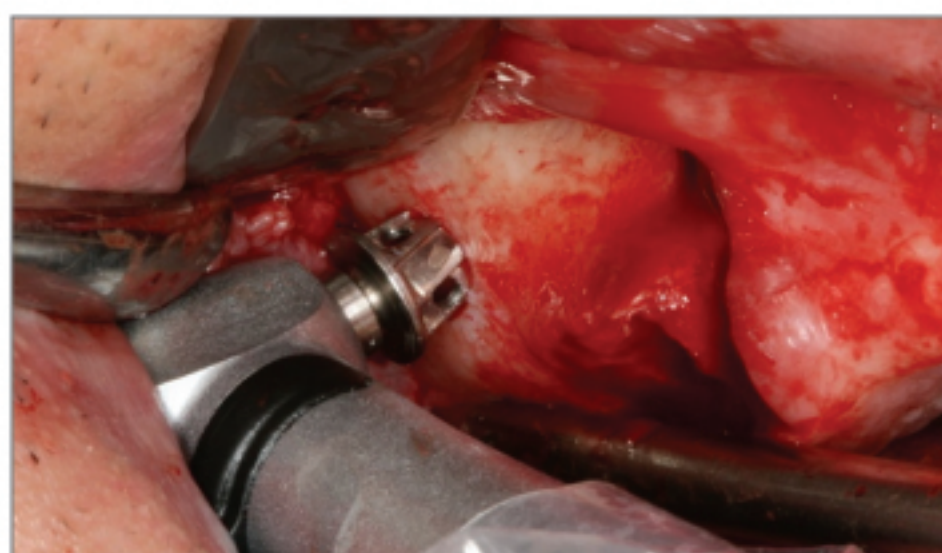
Case 2. (Simultaneous 3 ~ 4 fixtures placement)



1. The residual bone height was estimated as 1 ~ 3mm for both sides. After extracting two teeth, four implants on the right side and three on the left side 3 implants will be placed.



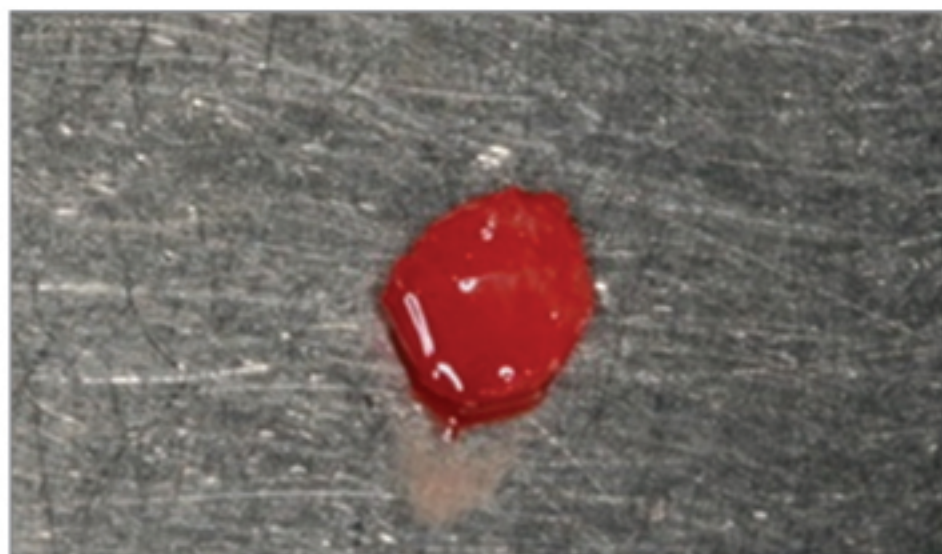
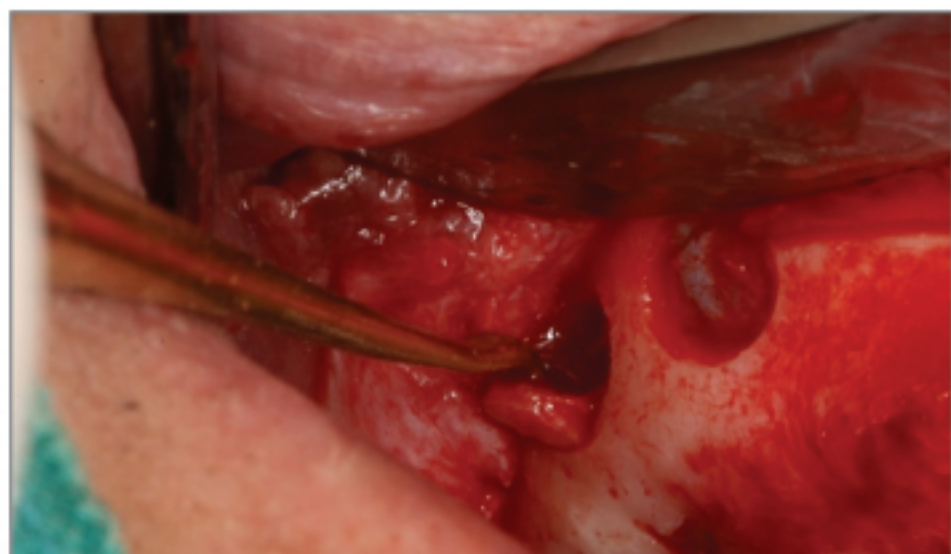
2. Extract remaining teeth. Make a flap and then form lateral holes.



3. The formation of the lateral hole using C-reamer was performed at 2,000~5,000 rpm under sufficient watering.



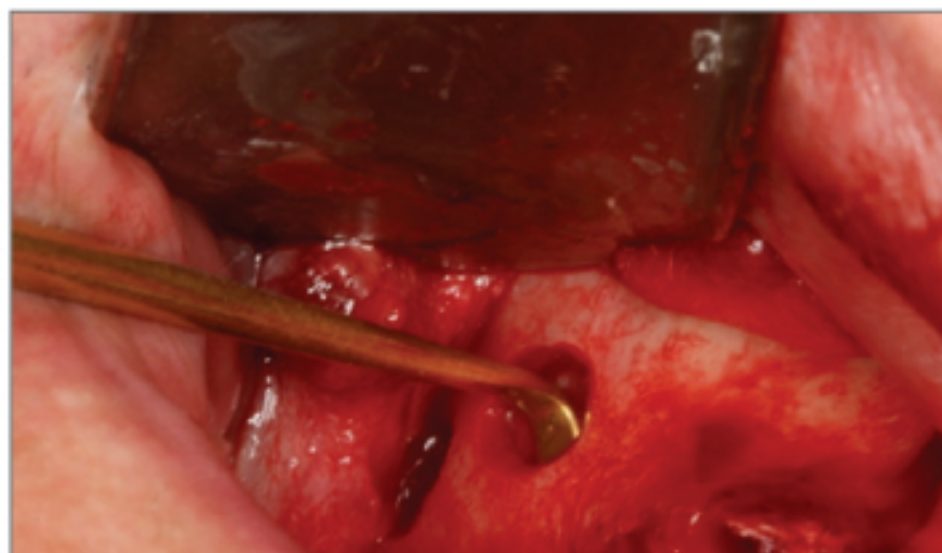
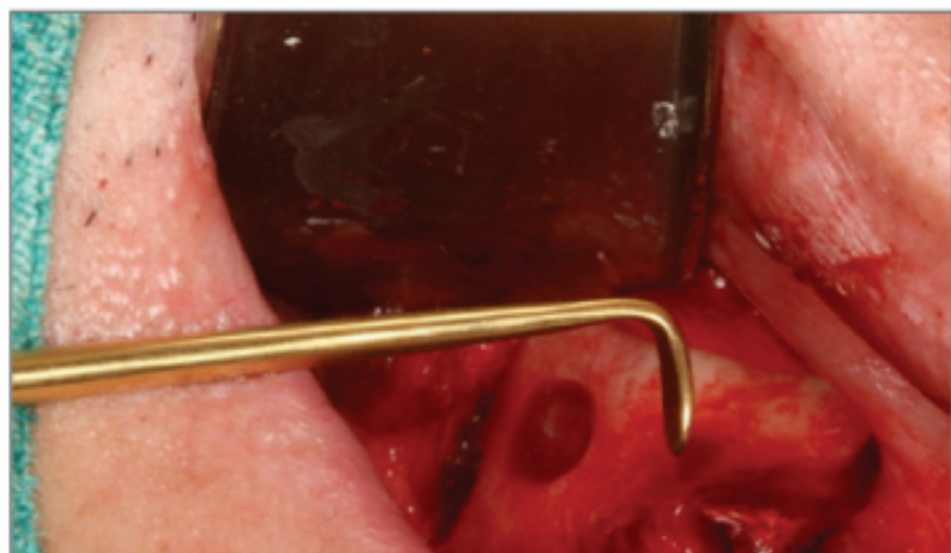
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4. Remove the bone core using by elevators. This bone core disk will be utilized to cover the lateral hole before suture.

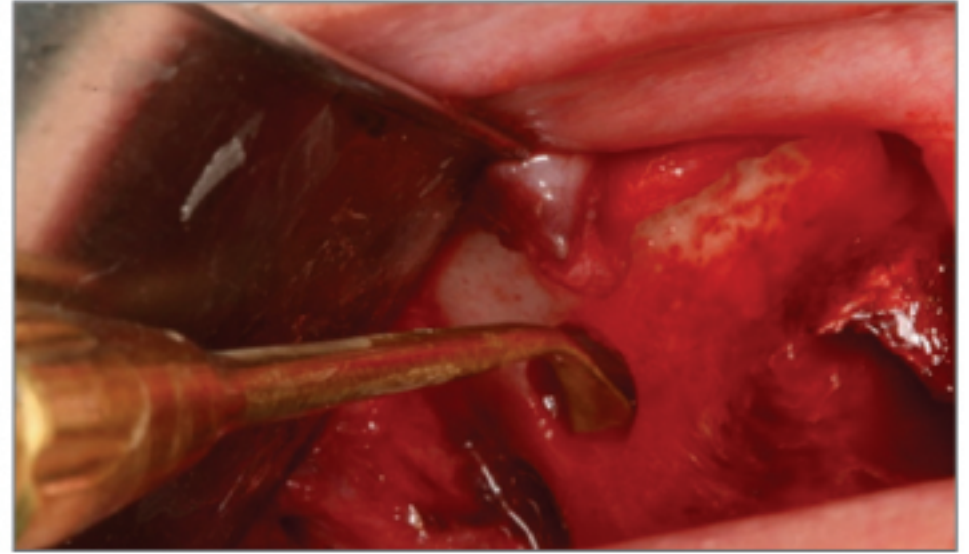
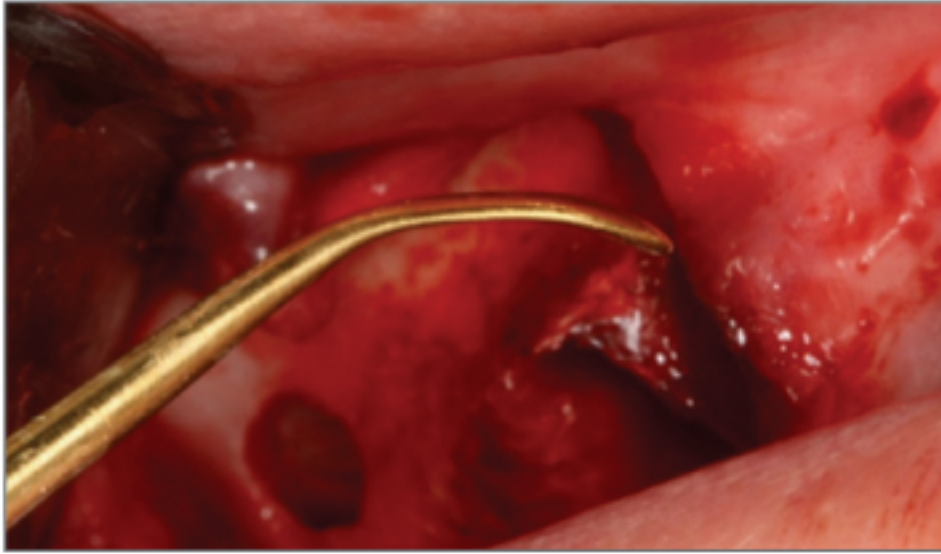


5. Use elevator #1 to lift the membrane from mesio-distal buccal wall.

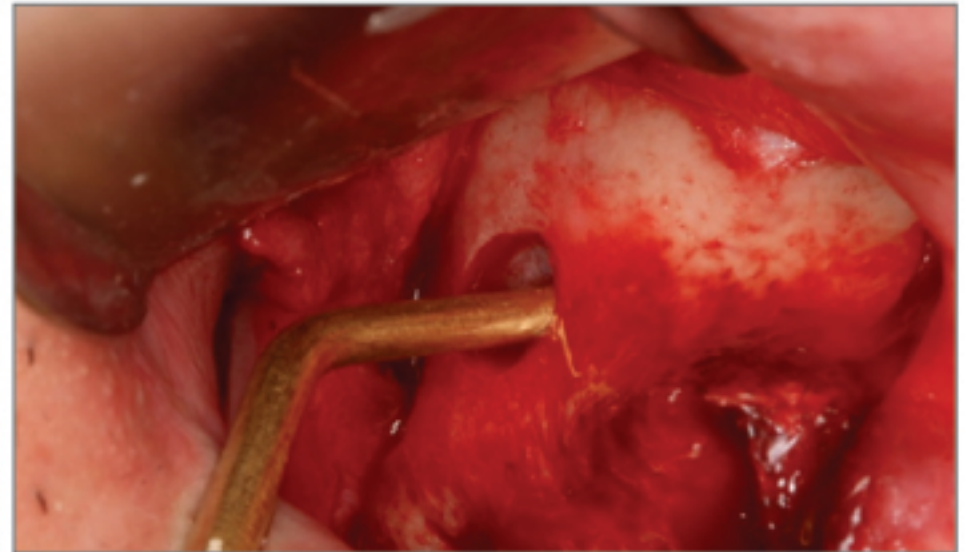
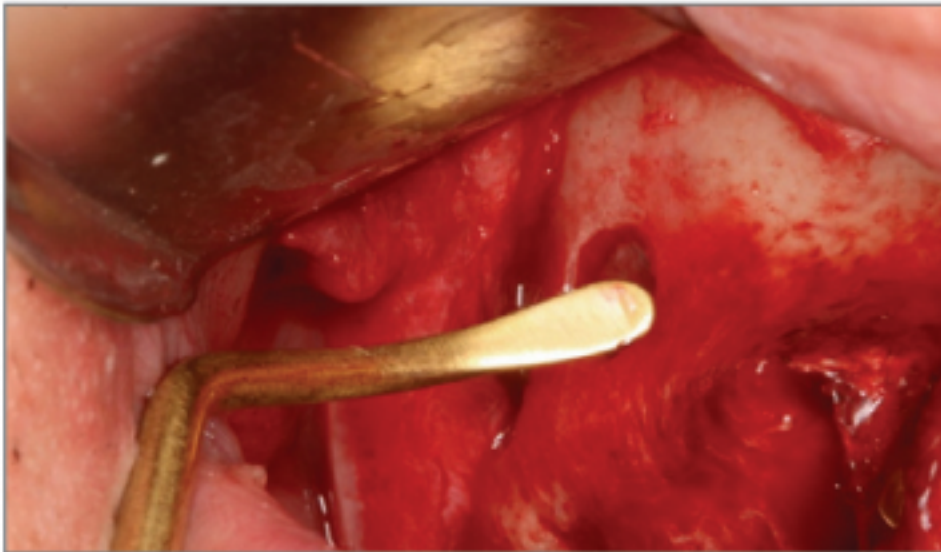


6. With the L shape of elevator #2, membrane from lower buccal wall site was detached.

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7. With the opposite part of L shape of elevator #2, separate the membrane from the inferior, medial and posterior wall.



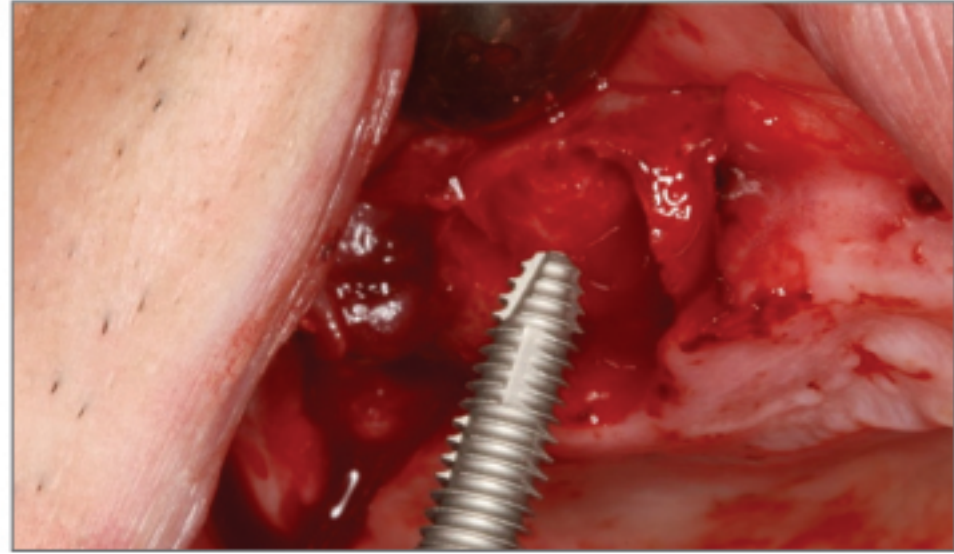
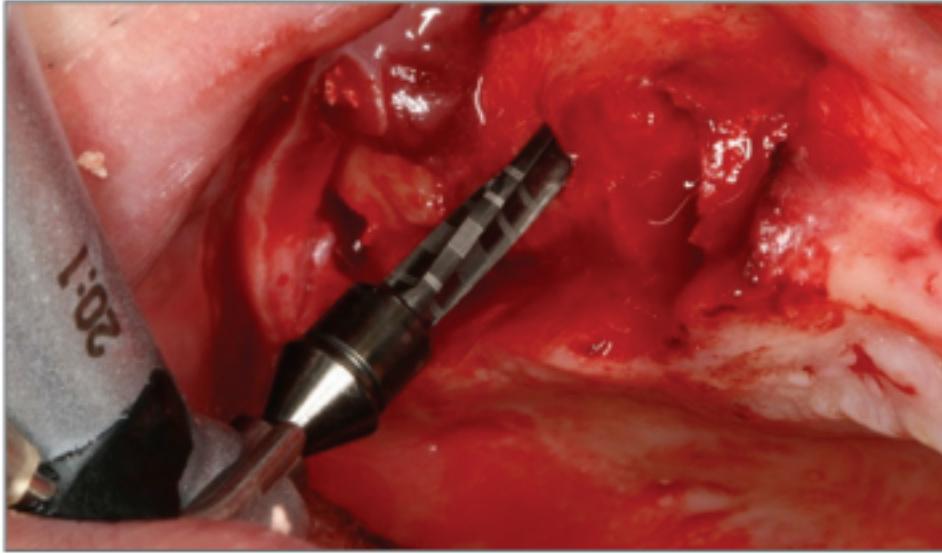
8. Using elevator #3, complete the elevation from the anti-post wall and other sites.



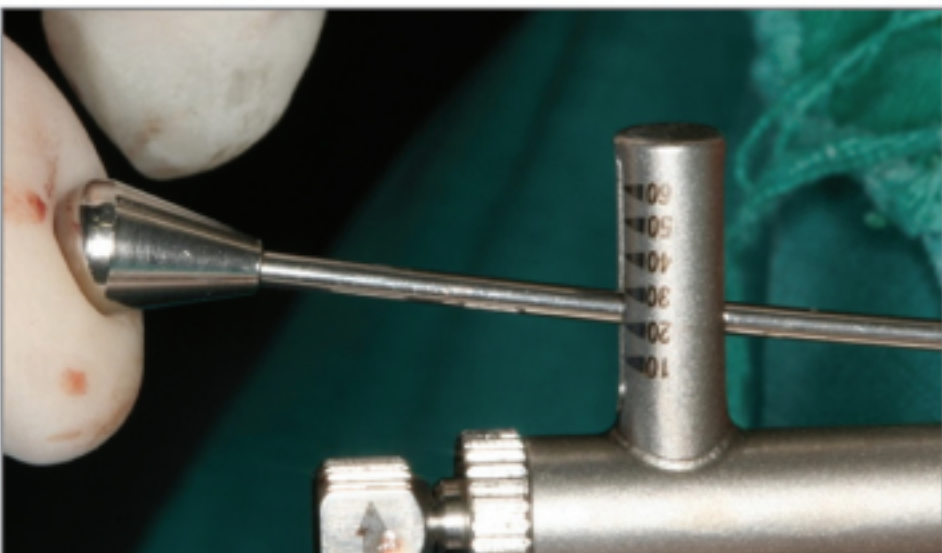
9. Graft the bone materials (Regenoss + Calpore) into lateral hole.



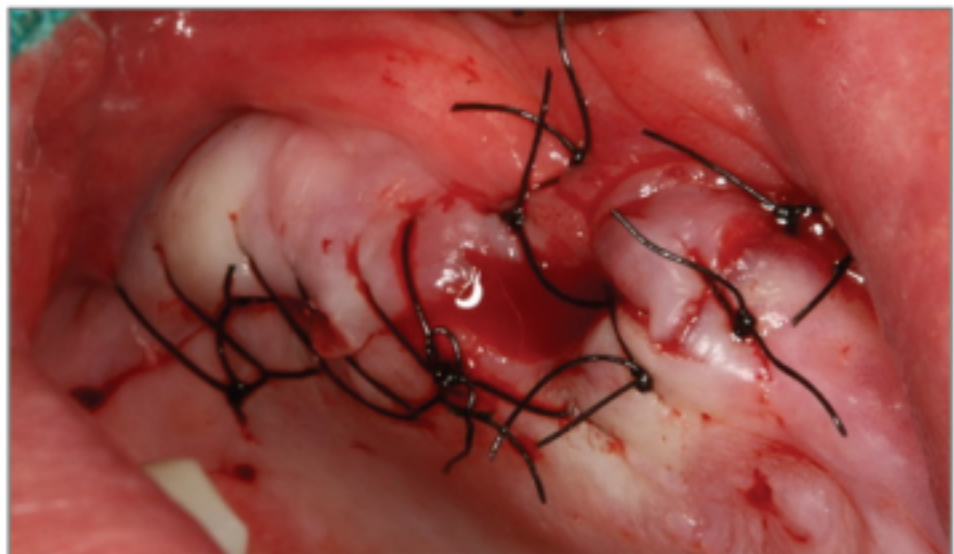
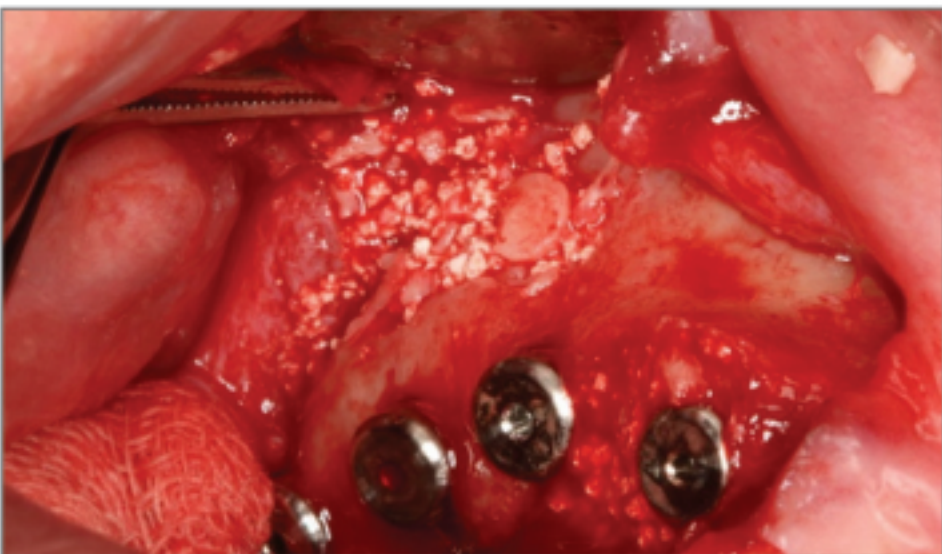
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10. After drilling, the EB $\phi 5 \times 13\text{mm}$ fixture was placed.

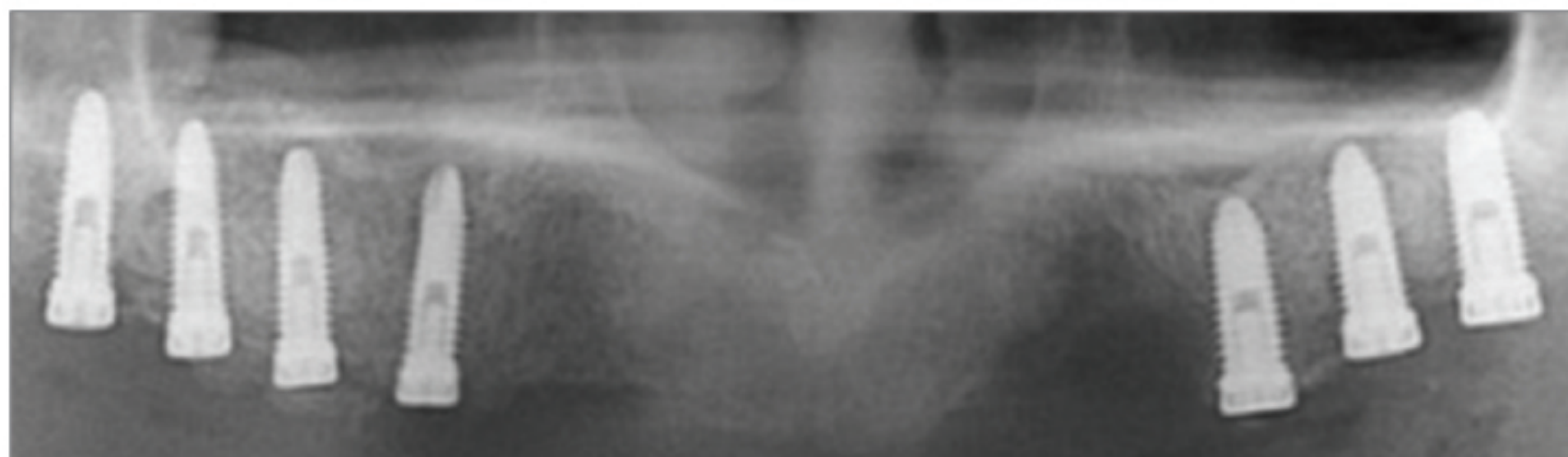


11. Even though the torque of 25Ncm for the fixture was obtained, the residual bone was too thin therefore the cover screw was positioned.



12. After completing the bone grafting the lateral hole was covered with the bone core disk obtained from the earlier step, and finally the suture was completed.

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13. From the panoramic radiograph the bone grafting was successful. With a similar procedure, three implants on the left site were placed.





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