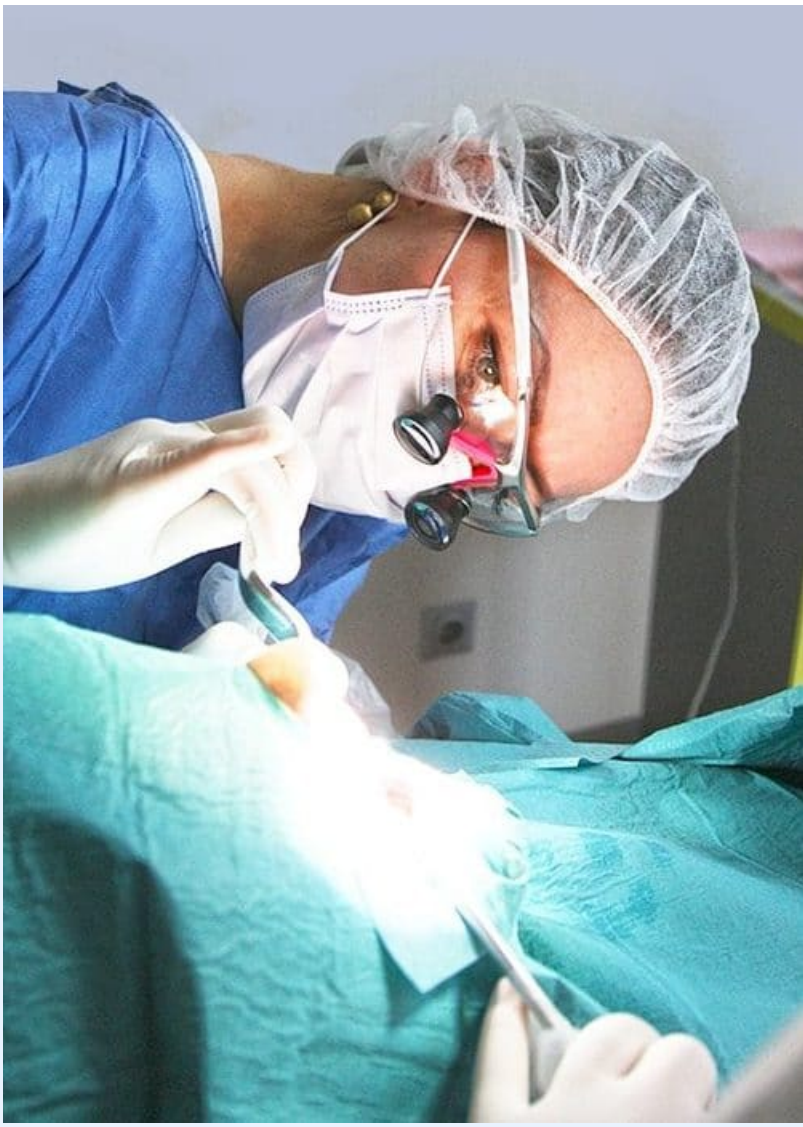
E-BOOK

AUGMA BONE CEMENT ACADEMY

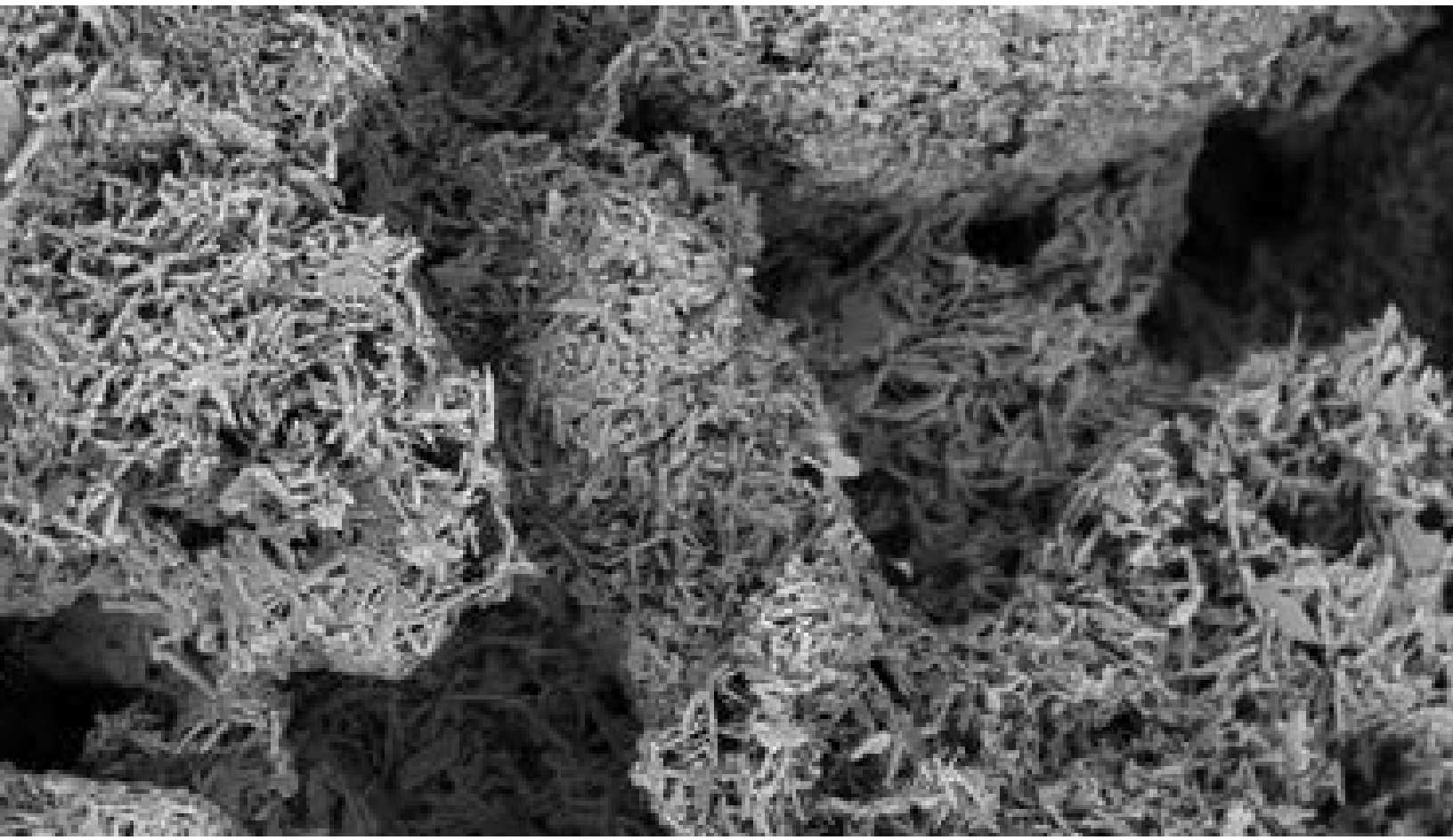
Bone Graft Cements
Features and Clinical Benefits

Augma BIOMATERIALS

Contents



SECTION 1



Biphasic Calcium Sulfate Overview

Calcium Sulfate

More than 100 years of documented clinical success in bone augmentation

Calcium sulfate (CS) features a unique position among all regenerative bone graft substitutes. With more than 100 years of documented clinical success, (Dreesmann 1892, Thomas and Puleo 2008) it has a longer history of clinical use than most currently available biomaterials.

Researchers and clinicians have continued to explore the effectiveness of the material in various applications. The long clinical history as an augmentation material was reported and published in thousands of scientific articles during 120 years of research, not only in dental and maxillofacial applications (Coetzee, 1980), furthermore in orthopaedic, plastic surgery, oncology, revision arthroplasty and spinal arthrodesis (Bucholz, 2002).

CS is widely recognized as a well-tolerated bone regeneration material. It undergoes virtually complete resorption *in vivo* and has consistently been considered as highly biocompatible, osteoconductive, and easy to use (Boden, 1999 or more recently by Pietrzak and Ronk, 2000; Ricci et al., 2000; Tay et al., 1999; Thomas et al., 2005; Thomas and Puleo, 2008).

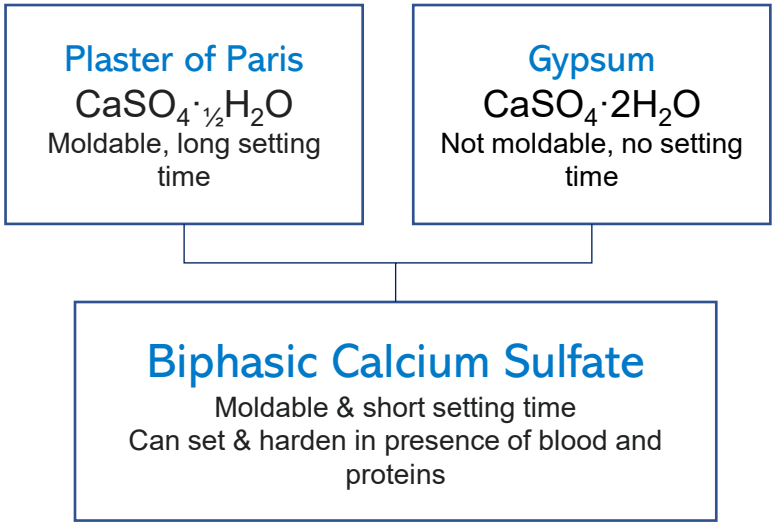
The raw material, medical grade calcium sulfate is clinically used in 2 different forms differing in their individual (crystal) water content and their physicochemical behavior. (Anusavice 2003).

Biphasic Calcium Sulfate

Chemical & Physical Structure

In an in vivo scenario, proteins and other biological macromolecules may further retard the setting time to up to 200 min. This is impeding the application procedure as well as the clinical performance for a typical dental application significantly (Ricci 2000).

Although Orsini and co-workers have shown that there are no differences in the bone healing pattern between preset CS dihydrate granules and moldable CS-hemihydrate cement. (Orsini 2004), by using preset CS dihydrate the surgeon loses advantageous handling properties of the moldable cement derivative.



By making use of the Biphasic Calcium Sulfate, the previous setting issues can be solved: The CS hemihydrate component is controlling the cement consistency and moldability characteristics. The dihydrate component is regulating the setting properties.

Using this formulation, the setting process can be reduced from about 20 minutes to 3 minutes, also under in vivo conditions in presence of blood and saliva. The key performance criteria of CS-derived graft materials that was shown in numerous studies is the fast and effective vital bone formation as a result of the rapid dissolution in vivo. (Thomas and Puleo 2008, Toloue, Dahlin) These characteristics provoke advantageous clinical results in small and well-contained bony defects like extraction socket filling. (Toloue, Guarnieri).

Bond Apatite®

Bond Apatite® is composed of biphasic calcium sulfate and synthetic hydroxyapatite granules. With this formulation, the concept of a graft cement can be successfully applied for a wider range of indications.

The BCS affects an injectable graft cement and features fast resorption and new bone formation. The hydroxyapatite granules provide a slow-resorbing osteoconductive scaffold to preserve the augmented volume also over a longer time period.

The BCS matrix is supposed to feature complete resorption. The slow-resorbing hydroxyapatite granule matrix serves as longer range space maintainer for optimized volume control.

Bond Apatite® is delivered in a specially designed ready-to-use syringe containing the granulated powder and physiological saline. Mixing the powder component with the liquid in the driver results in a viscous composite that is suitable for direct injection into the graft site.

For more histological evidence and research visit [Augma Bone Cement Academy]

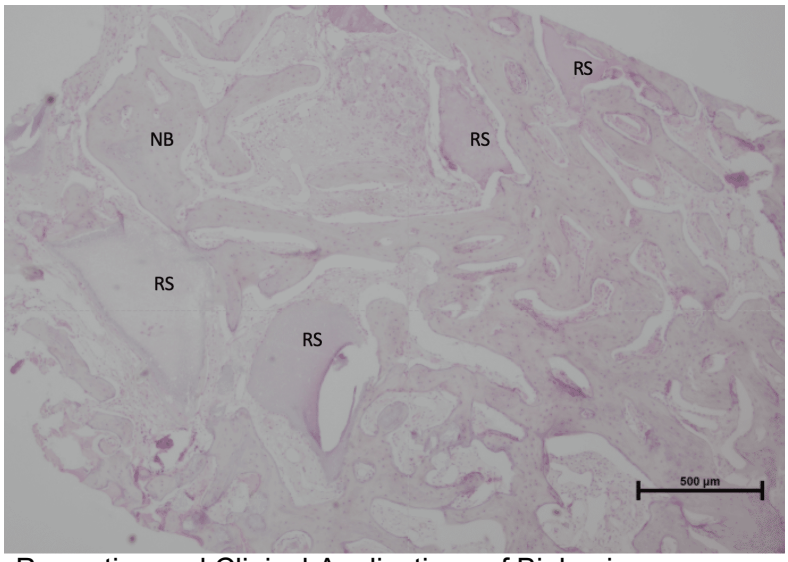
Histological Evidence

Complete Regeneration 8 Months Post-Op

3 Months Post-Op
Nearly 90% Bone Regeneration

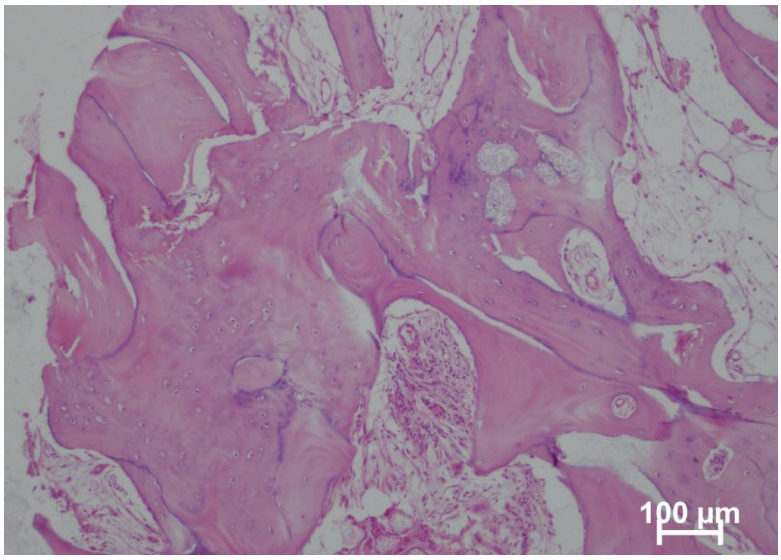
At 12 weeks after placing the Bond Apatite®, nearly 90% is replaced by the patient's own bone.

The HA particles occupying 1/3 of the composite graft are intended to slow down the overall resorption rate of the graft. The HA particles do not integrate with the bone, they are first encapsulated by connective tissue, slowly resorb, and later on, the remaining connective tissue under goes ossification.



Properties and Clinical Applications of Biphasic Calcium Sulfate, Yahav et al, April 2020.

8 Months Post-Op
Complete Regeneration

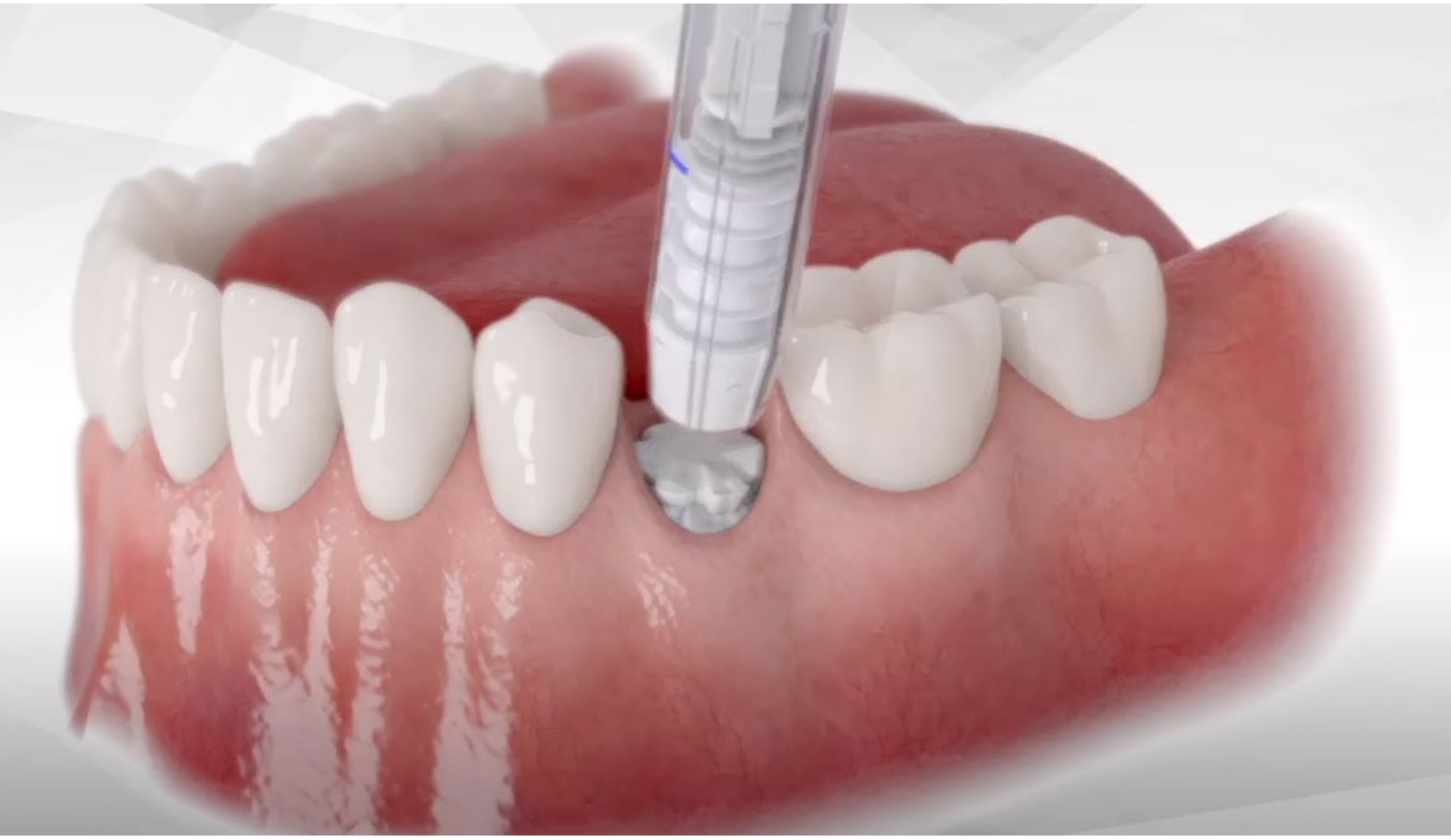


Properties and Clinical Applications of Biphasic Calcium Sulfate, Yahav et al, April 2020.

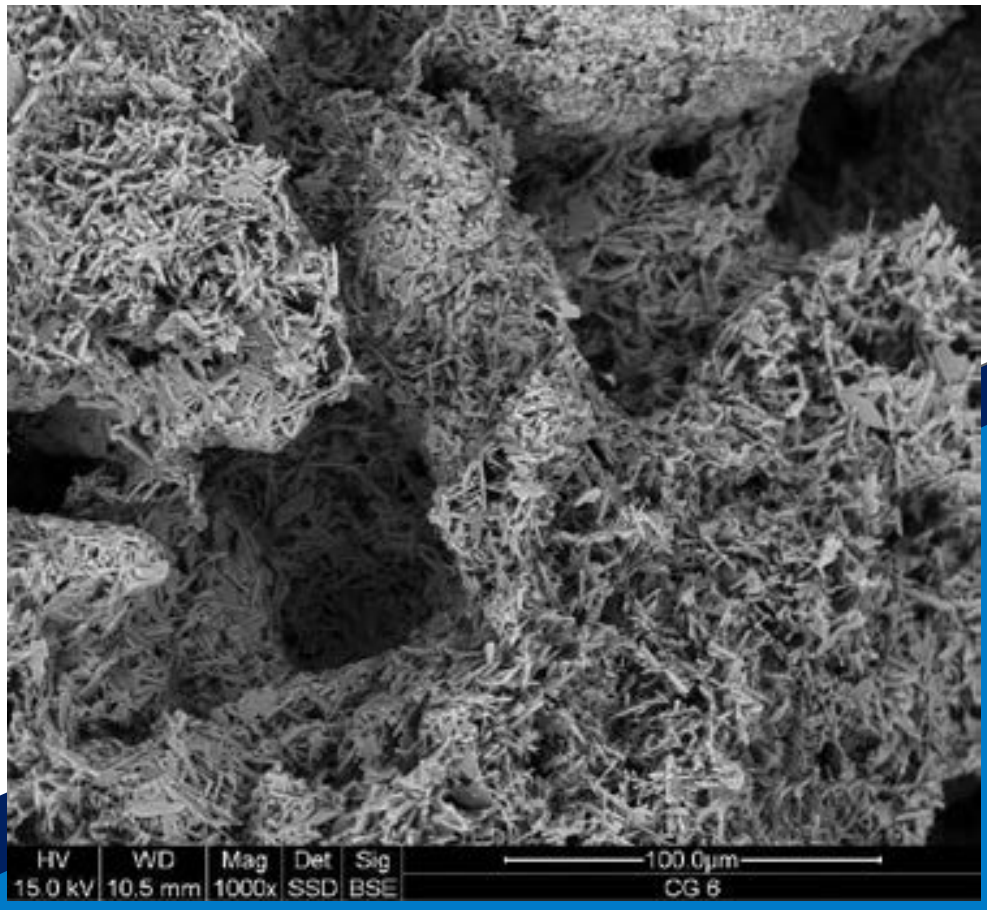
After eight months of healing time, the Bond Apatite® graft is almost entirely resorbed with no encapsulated materials remaining due to the complete transformation of the graft into the new vital bone.

The small and medium-sized HA particles resorb in 3-4 months. In contrast, the larger size particles, which comprise less than 10% of Bond Apatite®, will remain for a prolonged period, almost fully resorbed after eight months, and continues its resorption process up to a complete regeneration.

SECTION 2



Features and Clinical Benefits



Biphasic Calcium Sulfate

Clinical Benefits

Feature	Clinical Benefit
Osteoconductive and Bioactive	Complete bone regeneration
Prevention of infiltration of epithelio-connective cells	No membrane is required
Bacteriostatic	Can be left partially exposed
Biocompatible	Better healing and bone growth
Minimal inflammation	Following the surgical protocols leads to minimal swelling and post-operative pain to the patient
Encourages cells proliferation & angiogenesis	Promotes osteogenesis

FEATURE

Osteoconductive & Bioactive: Calcium Sulfate is entirely resorbed between 4-10 weeks and is replaced by the patient's own bone.

Calcium Sulfate is a short-term space maintainer which resorbs within up to 10 weeks. As it breaks down, Calcium Sulfate leaves behind key ingredients for stimulating bone growth. Due to its rapid absorption, Biphasic Calcium Sulfate is ideal for use in small bone defects such as socket grafting with four boney walls.

For larger defects Hydroxyapatite is mixed with Biphasic Calcium Sulfate to act as scaffolding as the new bone forms. With Bond Apatite®, complete degradation of the Biphasic Calcium Sulfate is quickly replaced by the patient's own bone, while the volume is maintained by the different particle sizes of Hydroxyapatite that eventually resorb and replaced by the new formed bone.

READ MORE

Journal of Clinical Oral Implants Research

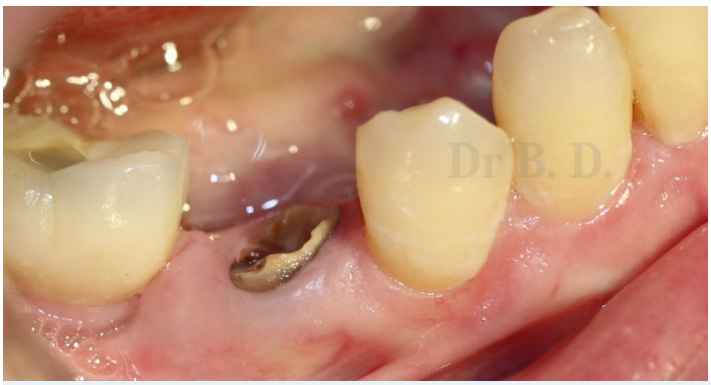
Journal of Biomedical Materials Research

Clinical Implant Dentistry and Related Research

Clinical Orthopaedics and Related Research®

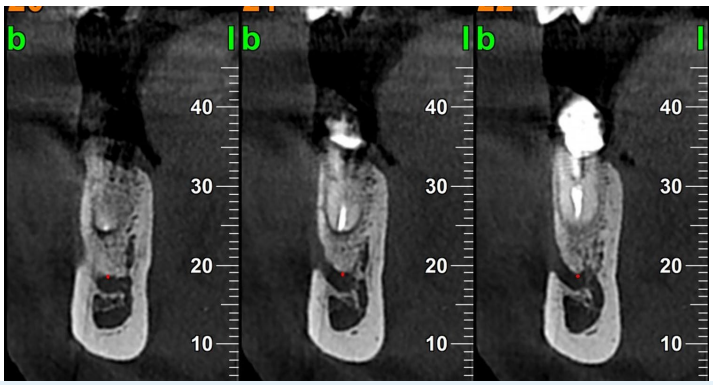
CLINICAL EVIDENCE

Fig. 1



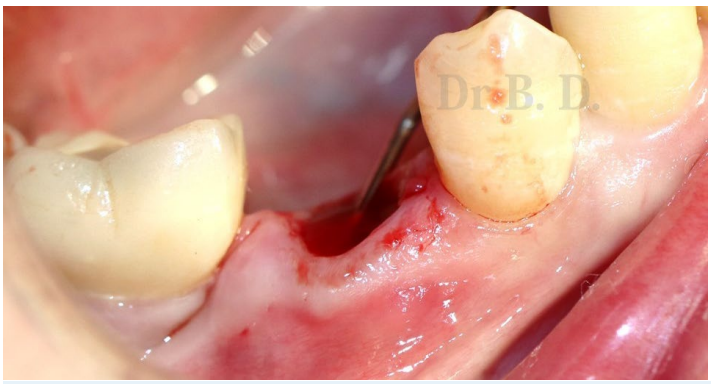
#44 (28) is to be extracted.

Fig. 2



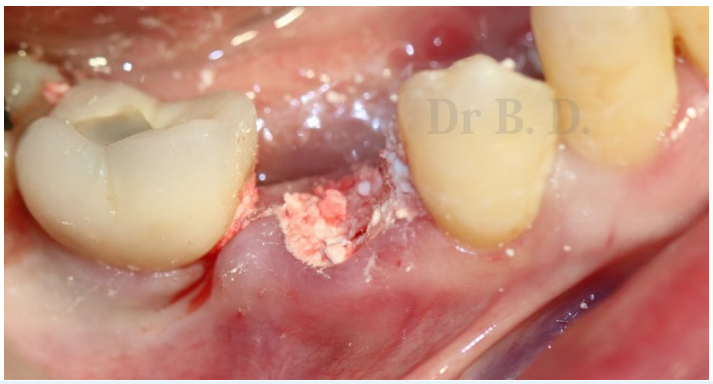
CBCT of #44 (28). We decided to graft and then to place an implant in a second step, while trying to preserve the buccal bone plate.

Fig. 3



Verifying the presence of 4 bony walls using a probe.

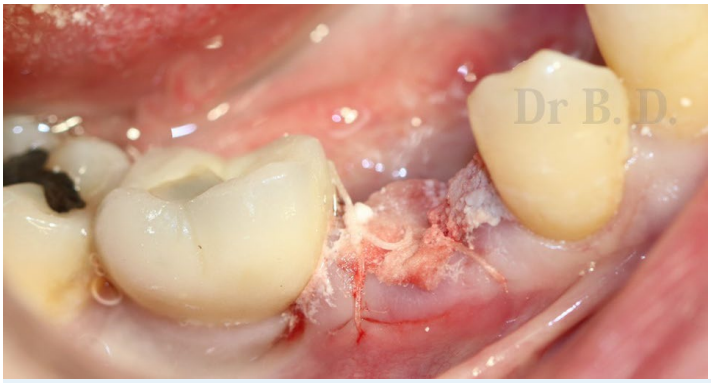
Fig. 4



Application of the Biphasic Calcium Sulfate.

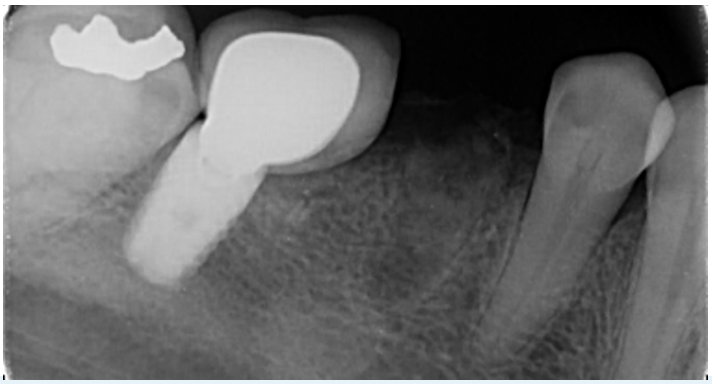
CLINICAL EVIDENCE

Fig. 5



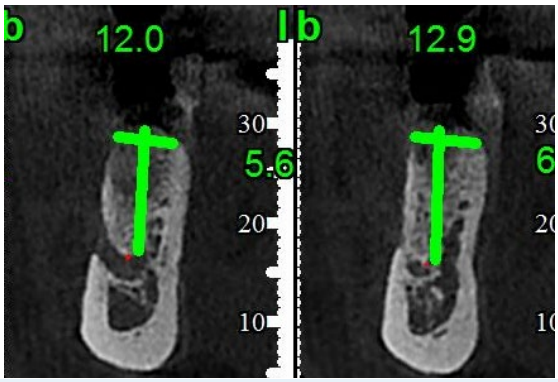
Coverage of the exposed Biphasic Calcium Sulfate by using a collagen sponge.

Fig. 6



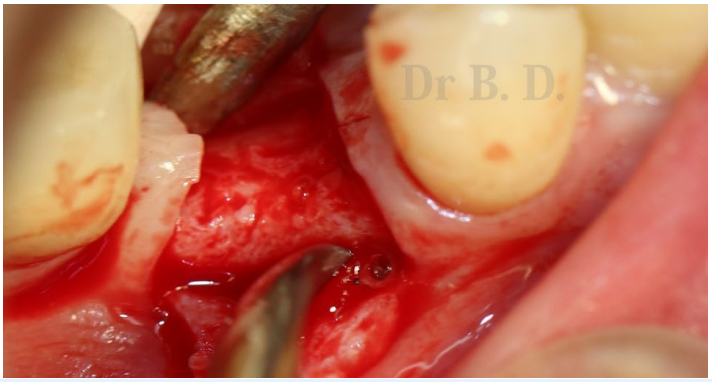
Periapical X-ray from the day of the operation.

Fig. 7



CBCT 4 months post-op displays bone formation and the process of its calcification.

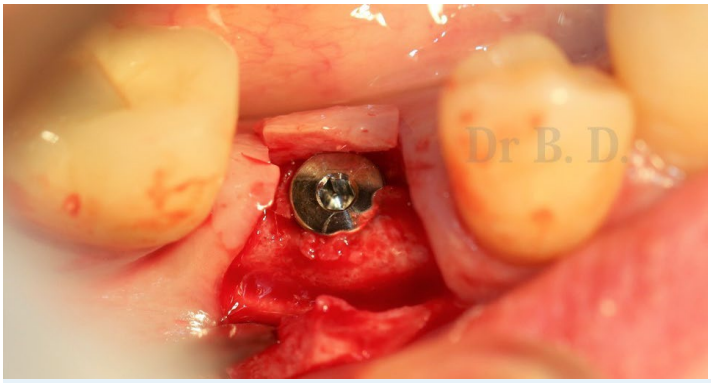
Fig. 8



Reentry - 4 months post-op, revealing 100% of bone regeneration.

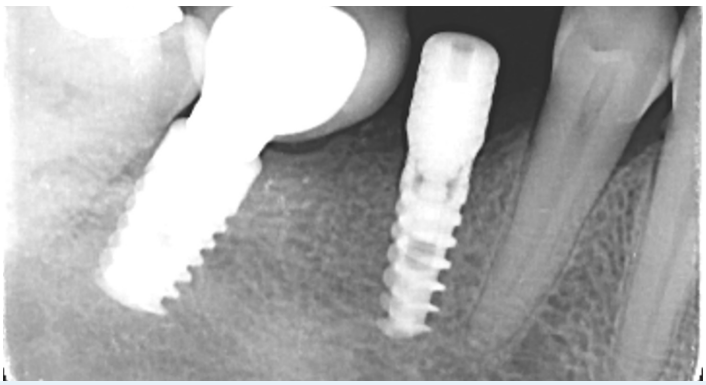
CLINICAL EVIDENCE

Fig. 9



Placement of the implant in young, vascularized bone.

Fig. 10



Periapical X-ray, 5.5 months post-op.

CONCLUSION

Biphasic Calcium Sulfate by itself is the bone filling material of choice for small bone defects with 3-4 bony walls.

In addition, Biphasic Calcium Sulfate forms a barrier which prevents soft tissue infiltration into the augmented site.

FEATURE

Biphasic Calcium Sulfate forms a barrier which prevents soft tissue infiltration into the material.

In traditional bone grafting, membranes are obligatory for the purpose of preventing soft tissue invagination. However, with Biphasic Calcium Sulfate the material itself acts as a graft and a barrier. Rather than penetrating the material, epithelial and connective tissue cells proliferate on the surface of the cement.

Due to the barrier effect, no membrane, or any other kind of additional barrier should be used for coverage of the cement. This has the added benefits of shorter and less invasive surgery.

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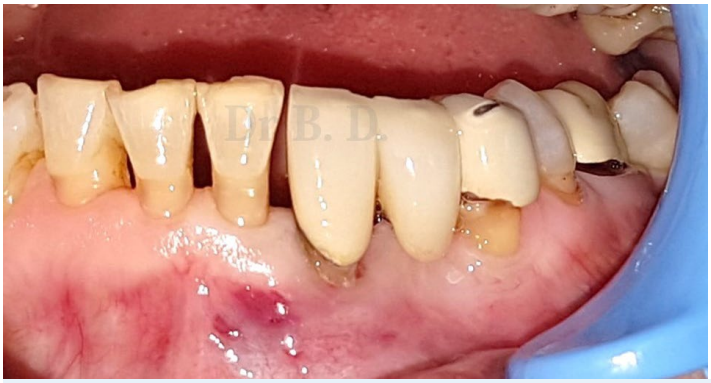
Biomatter

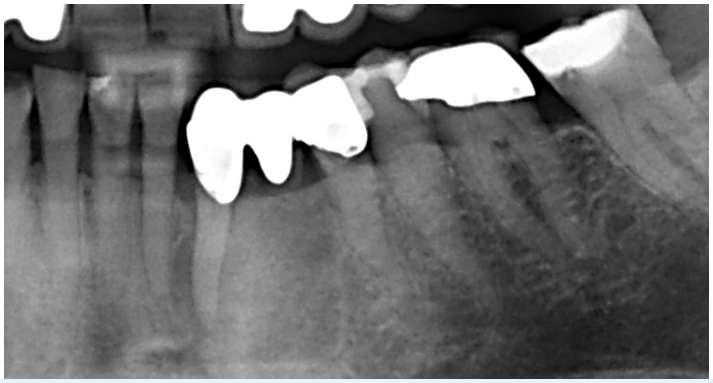
CLINICAL EVIDENCE

Fig. 1



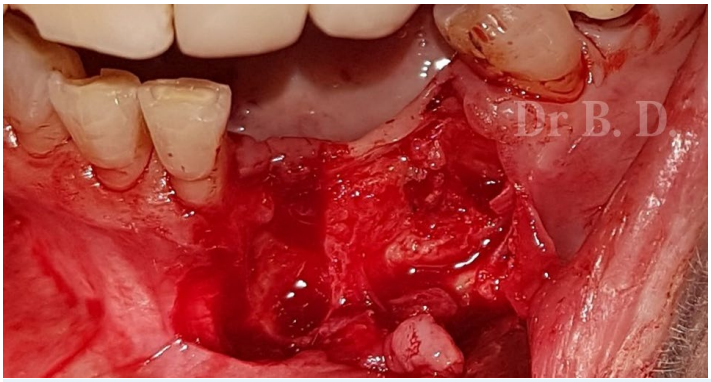
#32 (23) and #34 (21) are to be extracted, #32 (23) has significant inflammatory signs.

Fig. 2



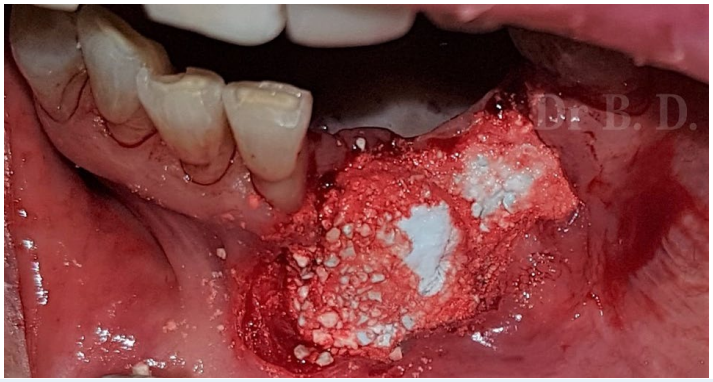
Panoramic X-ray represents the lesion in #32 (23).

Fig. 3



Very significant buccal bone deficiency in #32 (23).

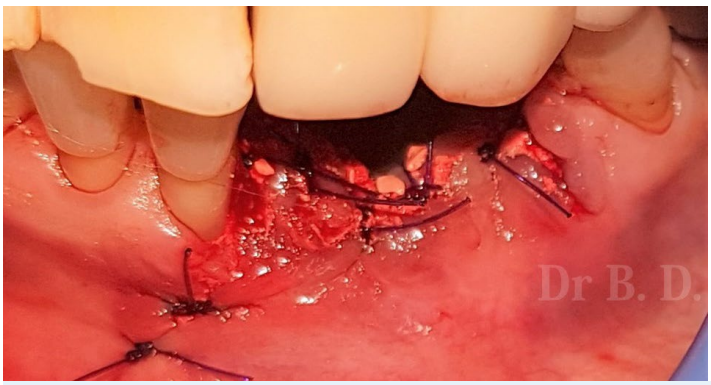
Fig. 4



Placement of a Bond Apatite® without membrane.

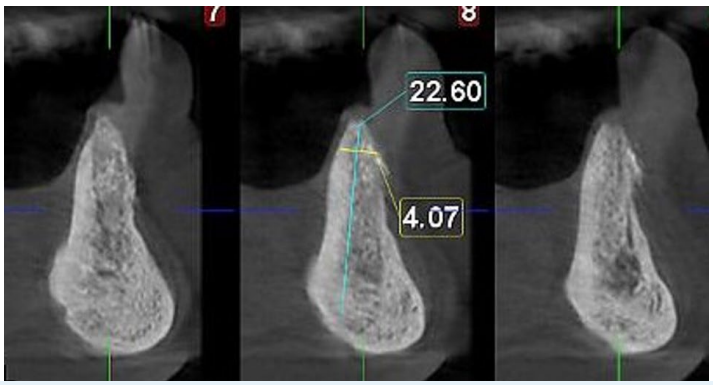
CLINICAL EVIDENCE

Fig. 5



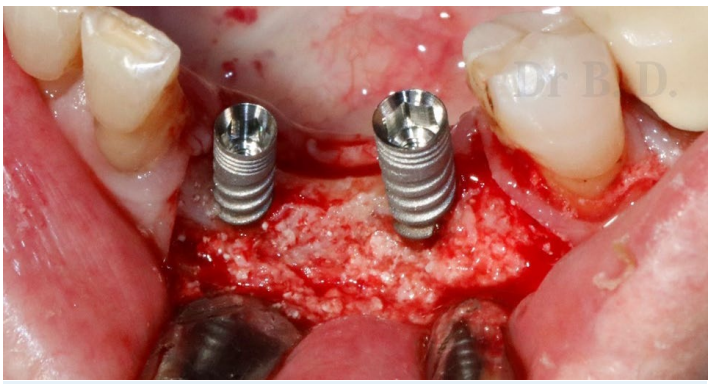
The flap is stretched & sutured under tension (not tension free).

Fig. 6



CBCT 4 months post-op Shows entire bone regeneration with complete reconstruction of the buccal plate.

Fig. 7



Placement of 2 implants in a young, native bone that is well vascularized.

CONCLUSION

Bond Apatite® forms a barrier preventing the invagination of epithelial and connective cells. For obtaining good results, ensure the cement is well compacted. No membrane or other forms of barriers are required.

FEATURE

Biphasic Calcium Sulfate is bacteriostatic.

Biphasic Calcium Sulfate is a salt which is known for its bacteriostatic nature. This feature enables the cement to be left partially exposed to the oral cavity.

Consequently, primary closure is not obligatory, and the cement is less susceptible for infection due to exposure.

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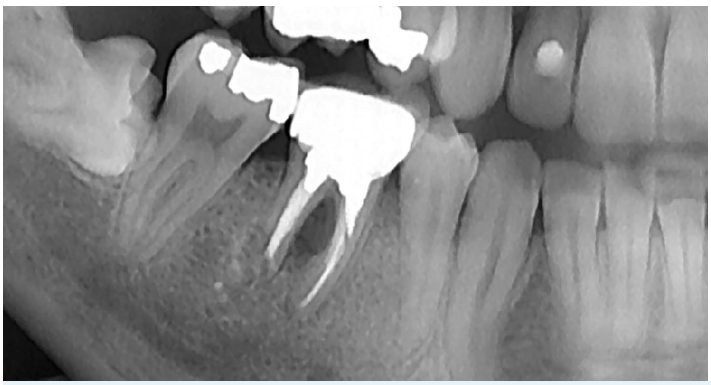
International Journal of Dentistry

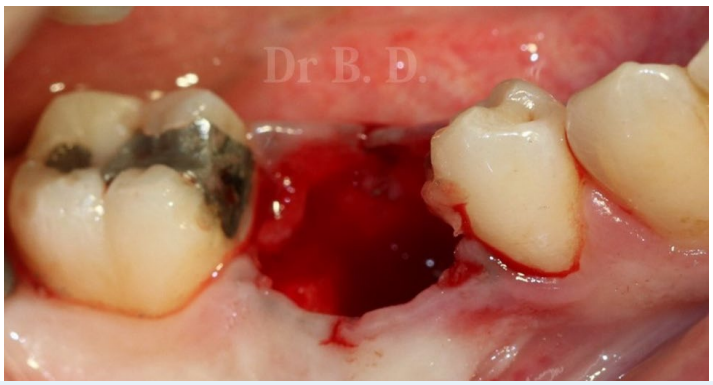
CLINICAL EVIDENCE

Fig. 1



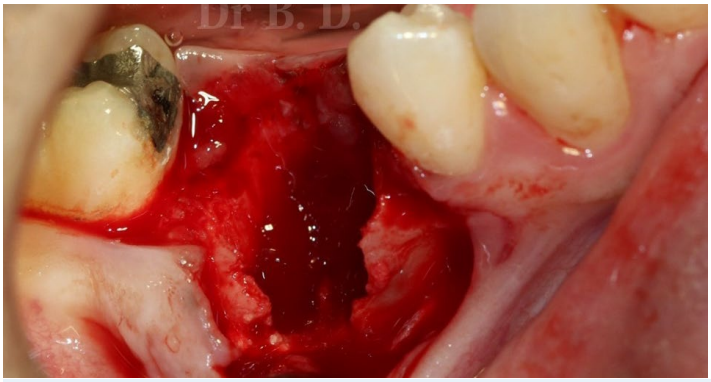
#46 (30) needed to be extracted due to a large lesion between the roots.

Fig. 2



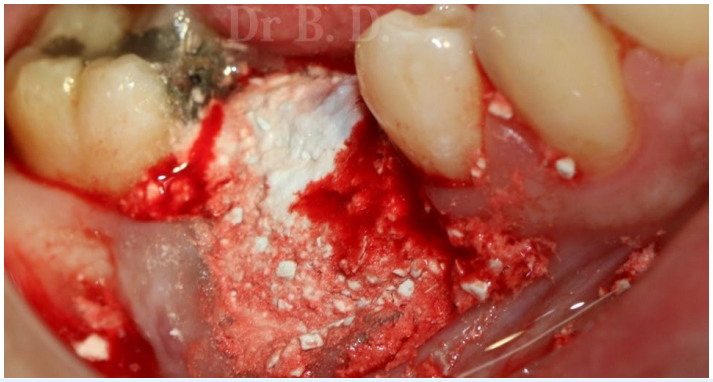
Extraction of #46 (30) and cleaning of the granulation tissue.

Fig. 3



The buccal plate is missing. Following protocol #2, the flap has been opened to expose the entire defect.

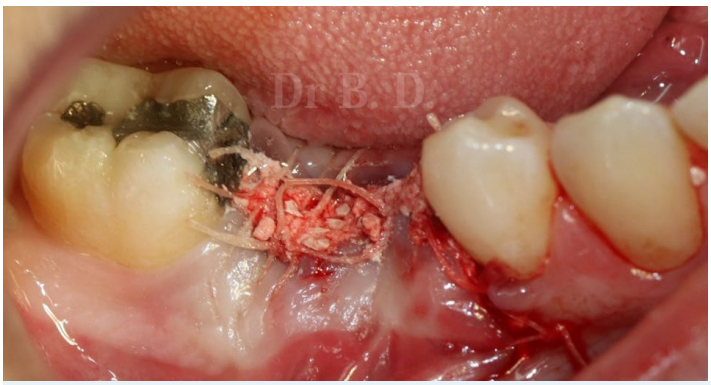
Fig. 4



Placement of Bond Apatite®.

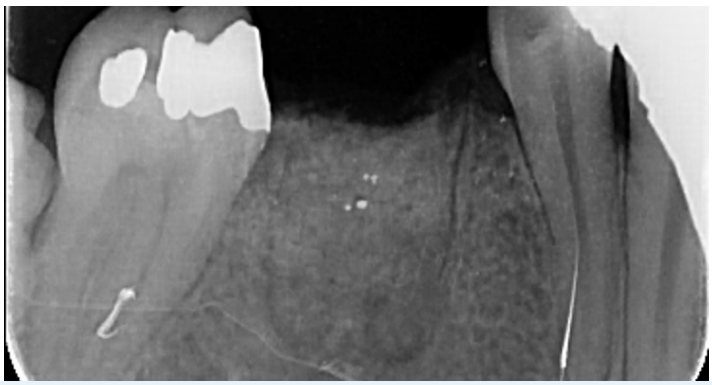
CLINICAL EVIDENCE

Fig. 5



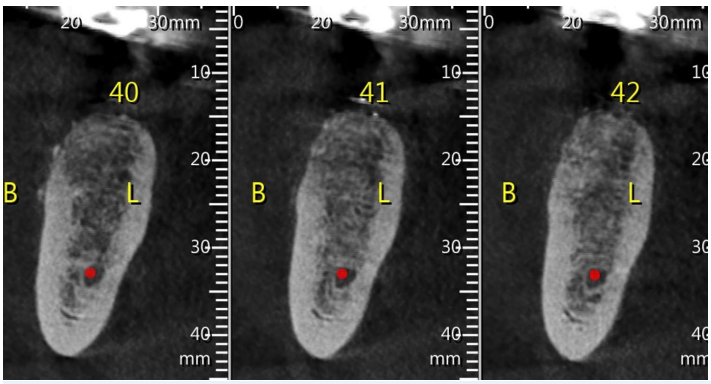
The flap was stretched under tension and sutured (No periosteal releasing incision or any soft tissue manipulation to gain tension free were required).

Fig. 6



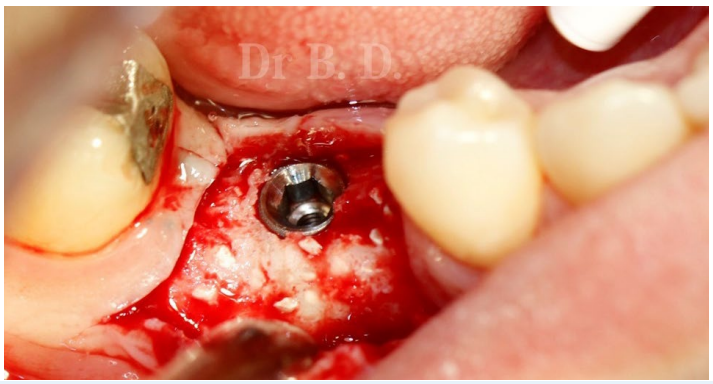
Periapical X-ray with Bond Apatite® in place.

Fig. 7



CBCT 3 months post-op represents a complete bone regeneration.

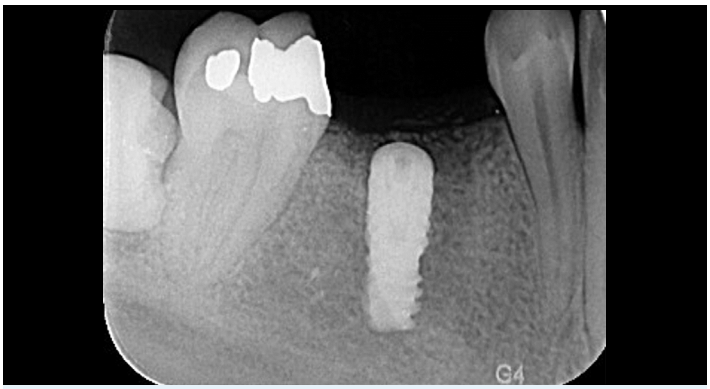
Fig. 8



Reentry 3 months post-op – Placement of the implant in a vascularized bone.

CLINICAL EVIDENCE

Fig. 9



Periapical X-ray – 3 months post implant placement.

CONCLUSION

The bacteriostatic properties of Bond Apatite® allow the cement to be partially exposed during flap closure with minimal risk of contamination.

FEATURE

Biphasic Calcium Sulfate is biocompatible.

Biocompatibility is a dynamic term that largely refers to the ability of a material or product to be accepted by, and function with, the human body. Calcium Sulfate is not only well tolerated by the body, but in fact works together with the body in many ways to promote optimal bone and soft tissue growth and healing.

Biphasic Calcium Sulfate stimulates the activity of osteoblasts needed for bone formation. It is completely resorbed, dissolves into components that are found in the human body and do not provoke an immune response.

Biphasic Calcium Sulfate is used without risk of a negative reaction from the body, and as a biocompatible material it aids in the healing and growth process.

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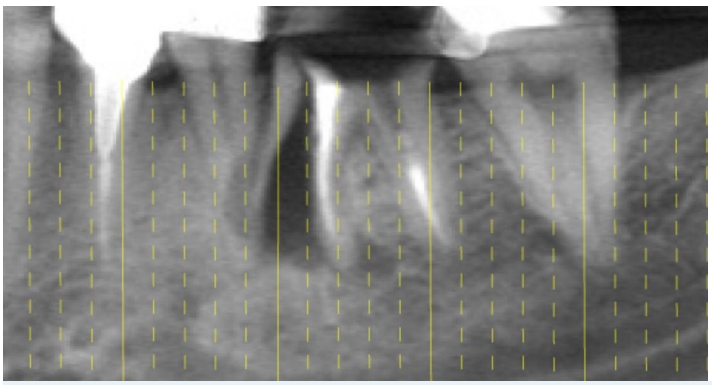
Endontology

Journal of Long-Term Effects of Medical Implants

Journal of Biomedical Materials Research. Part B. Applied Biomaterials

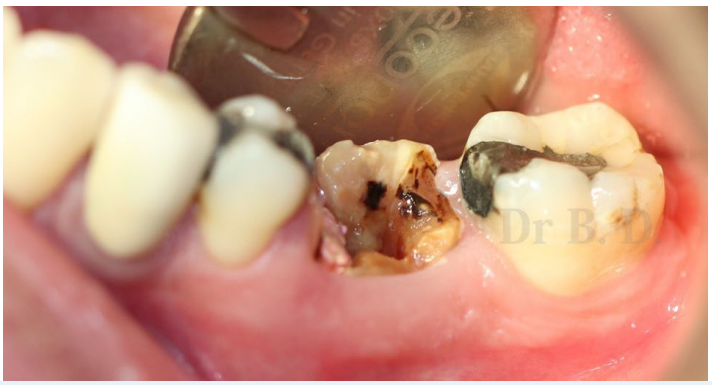
CLINICAL EVIDENCE

Fig. 1



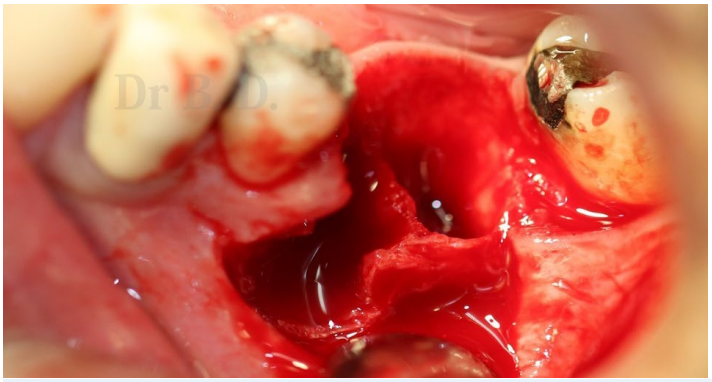
A large lesion of bone in mesial #36 (19).

Fig. 2



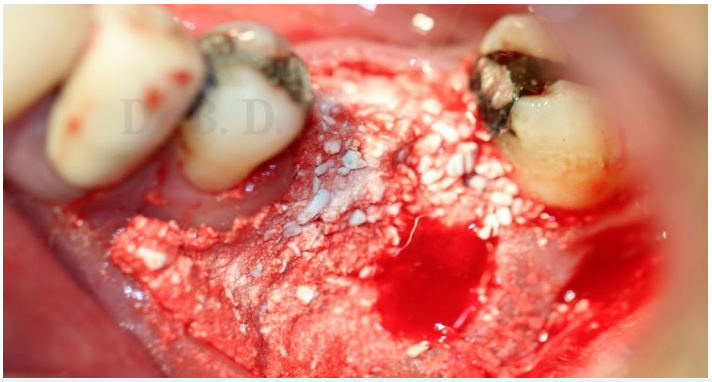
#36 (19) is to be extracted.

Fig. 3



A small flap has been opened in order to visualize the bone defect.

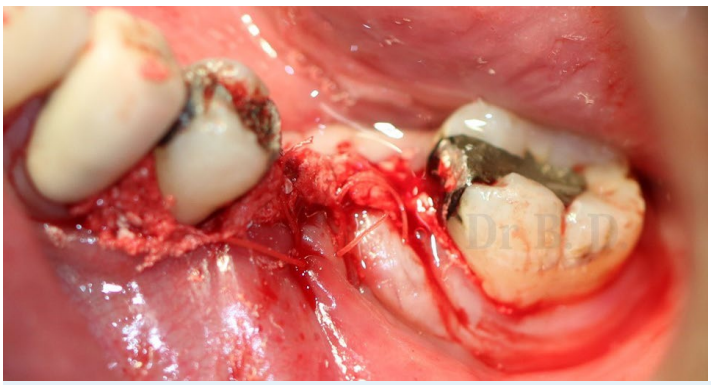
Fig. 4



Bond Apatite® in place serves as both graft and a barrier.

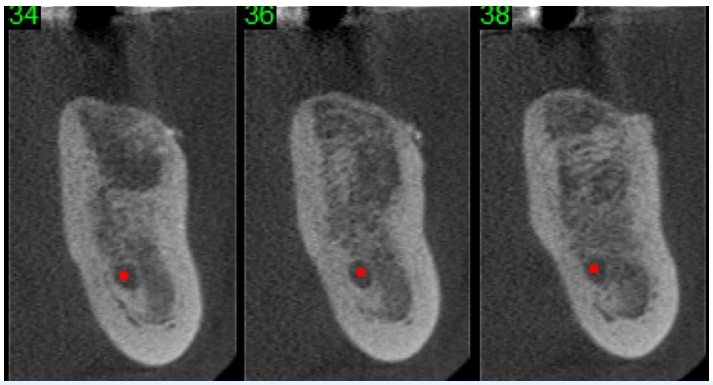
CLINICAL EVIDENCE

Fig. 5



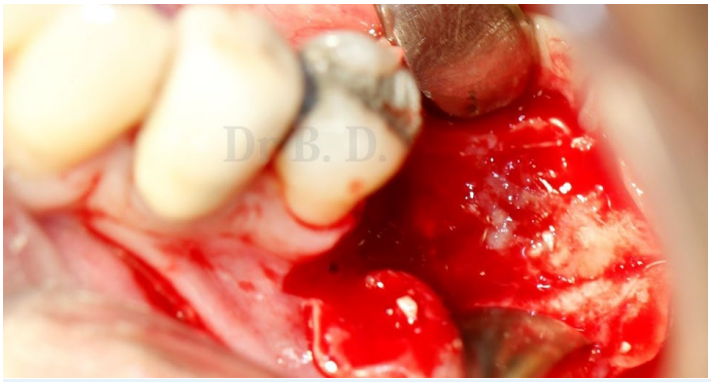
Experience has shown us that flap sutured under tension will not open.

Fig. 6



CBCT 8 months post-op showing very good bone regeneration with cortical bone formation.

Fig. 7



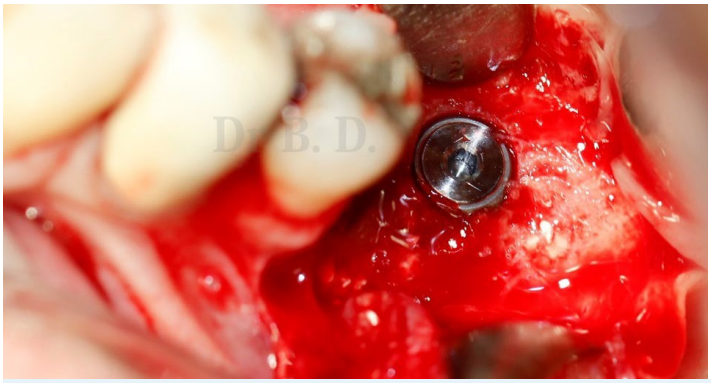
Reentry 8 months post-op shows the old defect has fully regenerated.

Fig. 8

Bone sampling was harvested with a trephine for histological analysis.

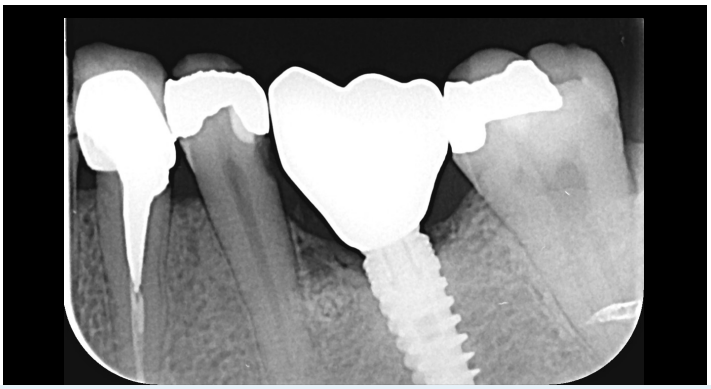
CLINICAL EVIDENCE

Fig. 9



8 months post-op – Placement of the implant.

Fig. 10



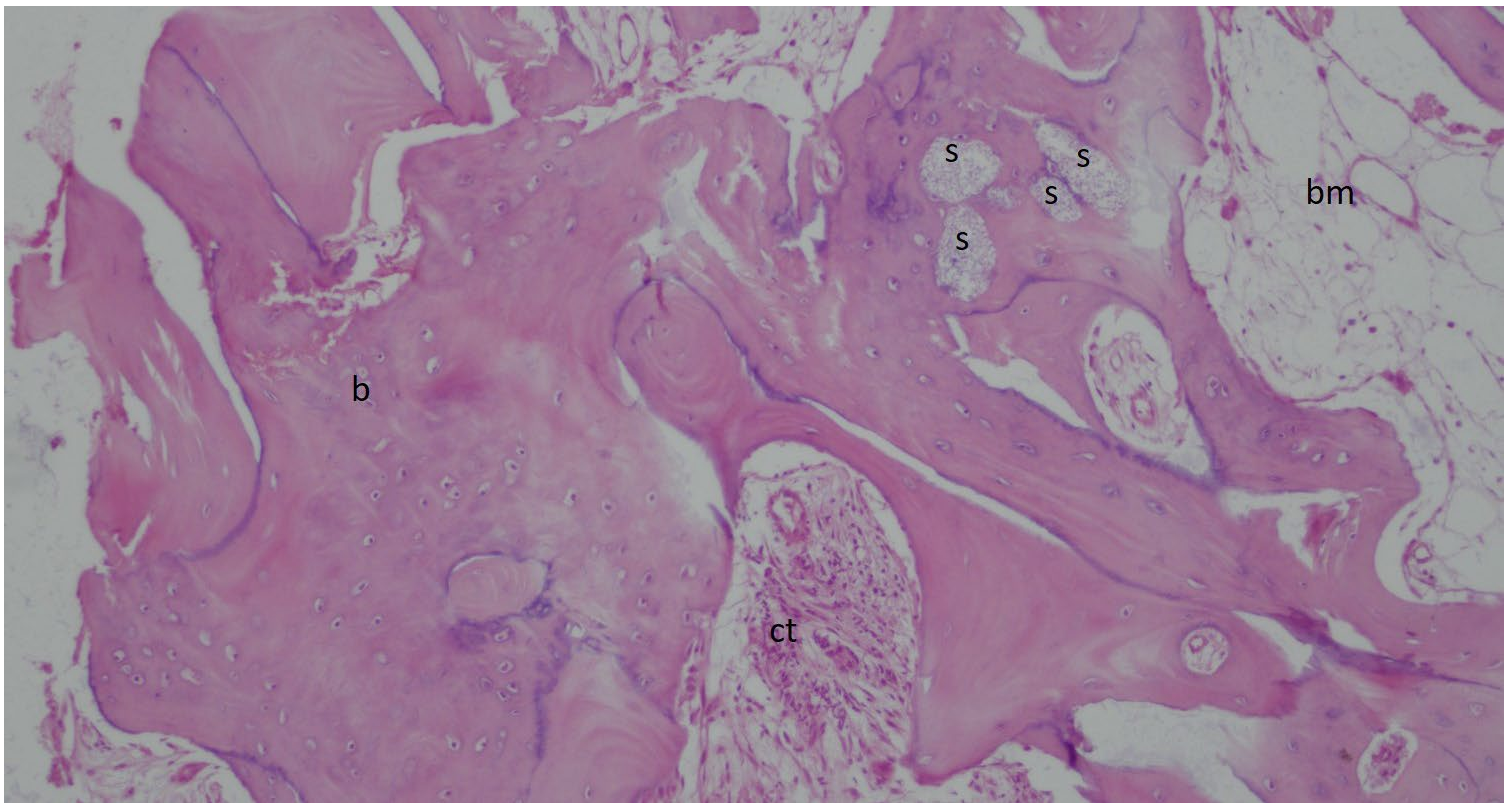
Radiographic appearance:

1 year post implant placement.

CLINICAL EVIDENCE

Complete regeneration 8 months post-op

Fig. 11



CONCLUSION

Uneventful healing and true bone regeneration is achieved.

FEATURE

Biphasic Calcium Sulfate provokes minimal inflammation.

Traditional GBR methods require tension free and primary closure and mostly require extensive flap reflections. Such procedures are intrusive to the patient and are largely associated with post-operative pain, swelling and hematomas.

The use of bone cement's surgical protocols require minimally invasive surgery that less traumatic to the patient with negligible post-operative complications, if any.

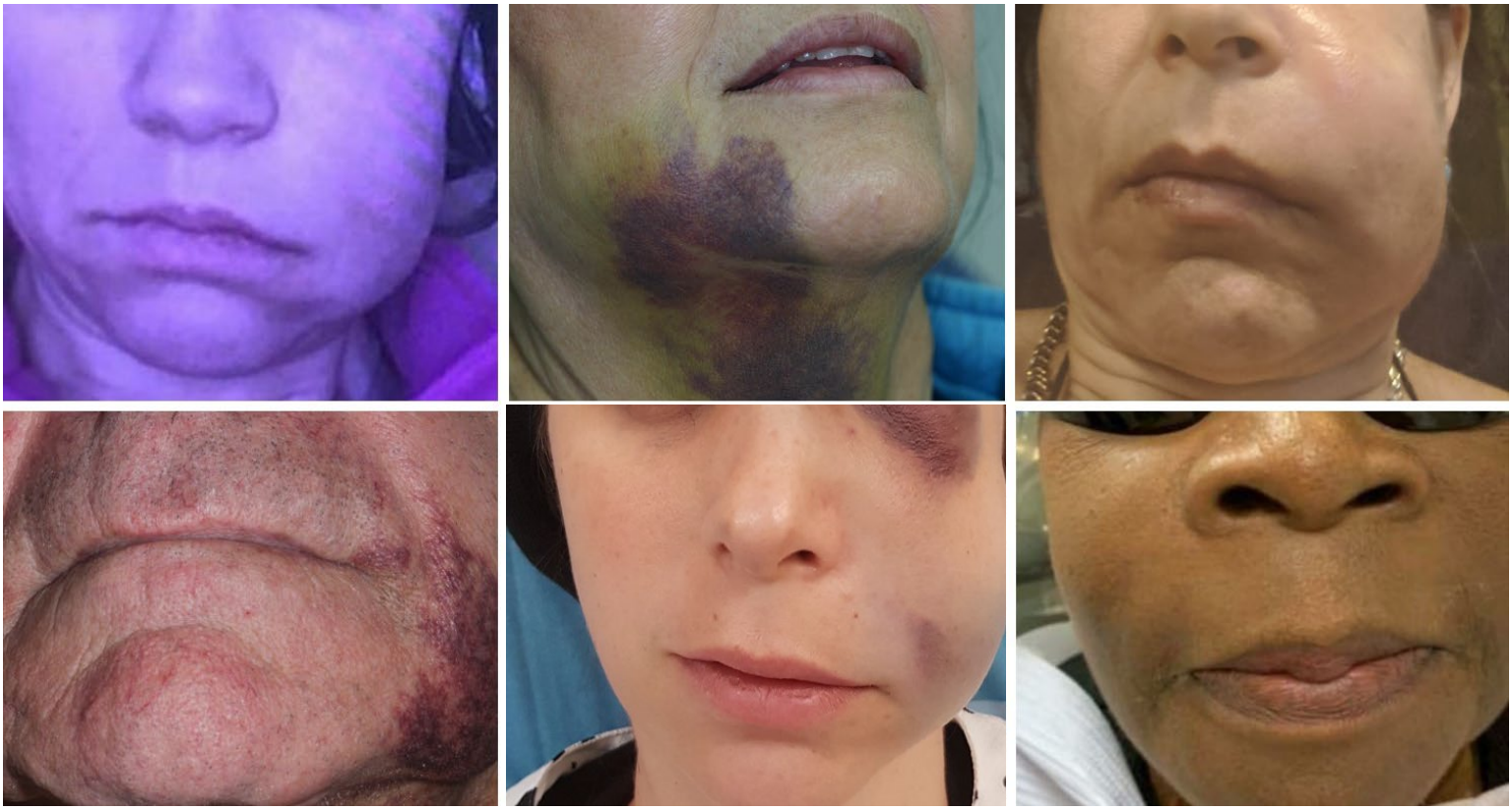
READ MORE

Augma Biomaterials, Clinical Literature

Clinical Implant Dentistry and Related Research

Journal of the International Clinical Dental Research Organization

Post-op surgery using traditional bone grafting materials.

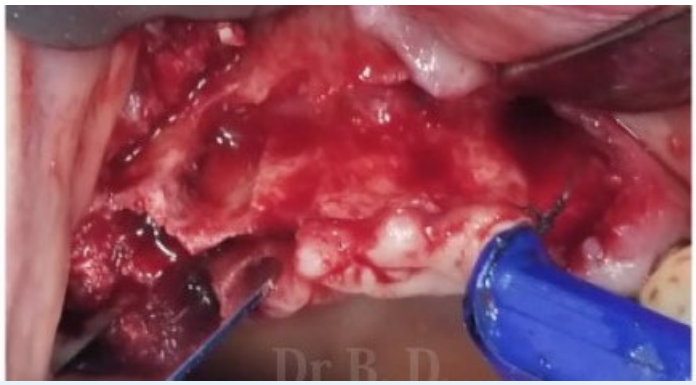


Examples of swelling and hematoma reactions, due to invasive surgeries during traditional augmentation procedures with traditional bone grafting materials.

CLINICAL EVIDENCE

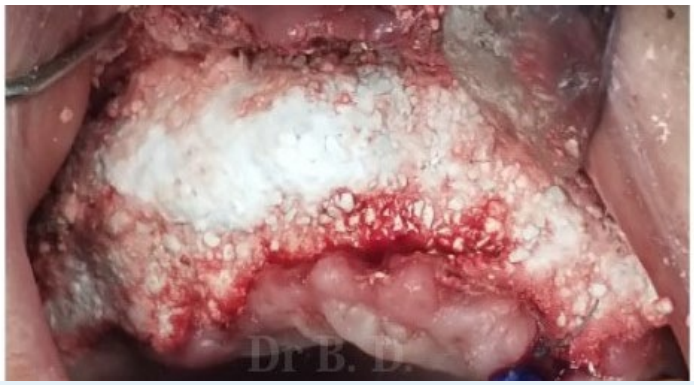
Bone cement surgical protocols resulting in minimal inflammatory reaction.

Fig. 1



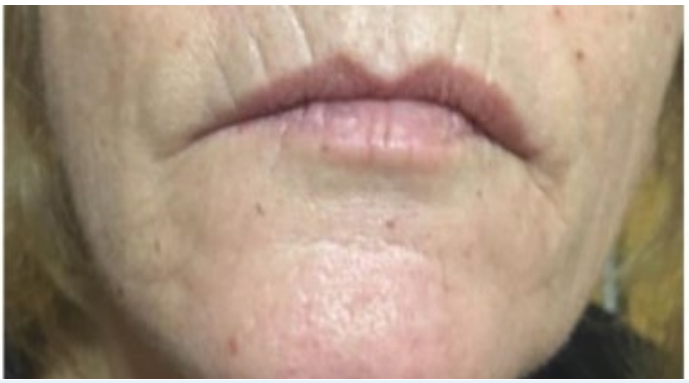
Flap for lateral ridge augmentation is minimally reflected to expose the defect. No periosteal releasing incision or soft-tissue manipulation is used to gain tension-free.

Fig. 2



Bond Apatite® in place.

Fig. 3

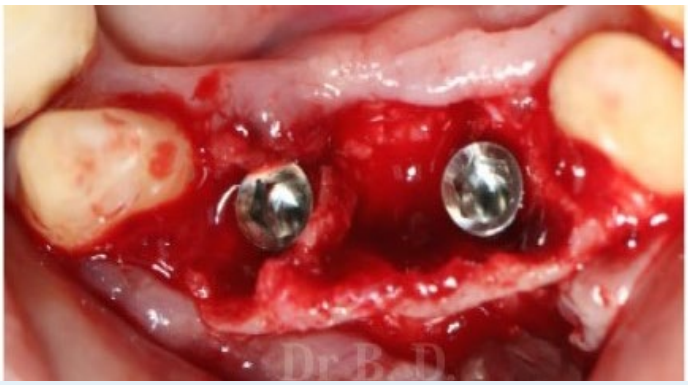


1 day post-op, no signs of hematoma or swelling.

CLINICAL EVIDENCE

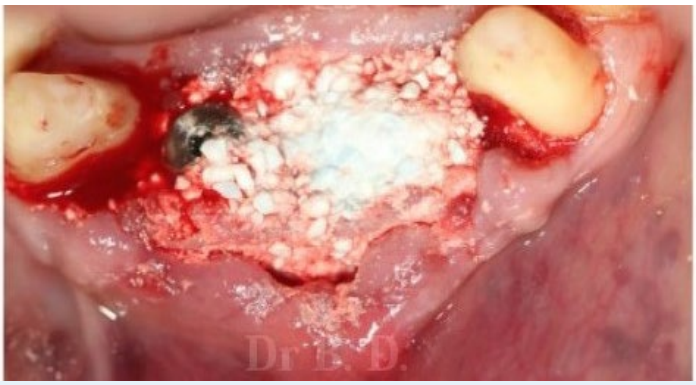
No swelling reaction or hematoma, and less pain.

Fig. 1



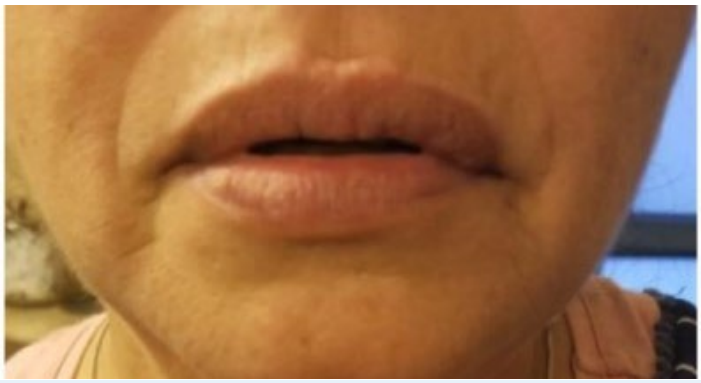
Four extractions and two implants in place.

Fig. 2



Filling gaps with Bond Apatite®.

Fig. 3

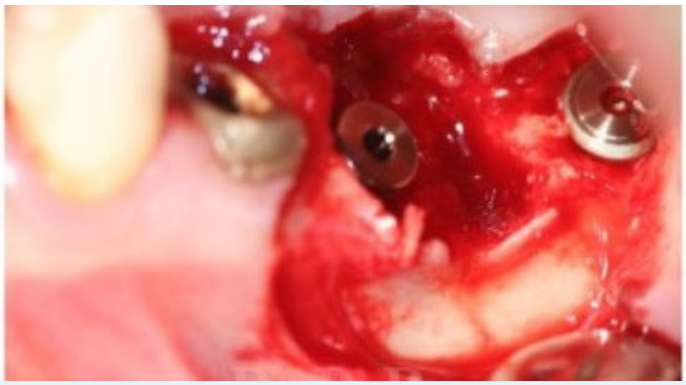


1 day post-op, no signs of hematoma or swelling.

CLINICAL EVIDENCE

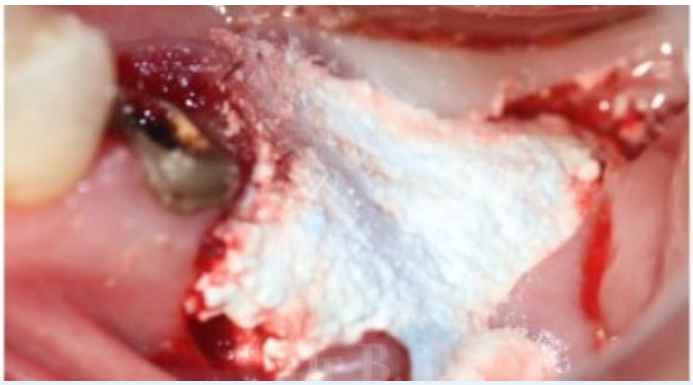
No traumatic experience for the patient.

Fig. 1



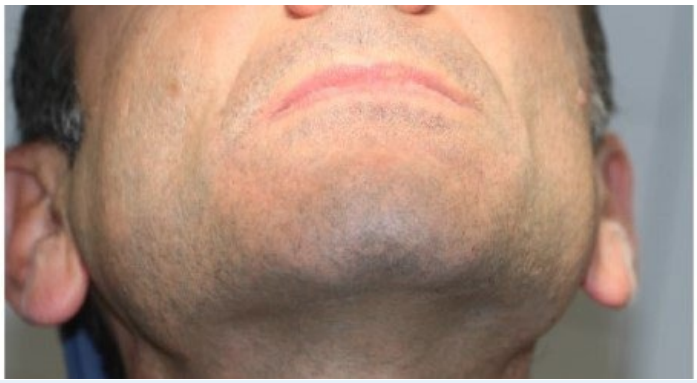
Tooth extraction of #36 (19) and immediate implant placement.

Fig. 2



Augmentation of the site with Bond Apatite®.

Fig. 3



1 day post-op, no signs of hematoma or swelling.

CONCLUSION

The patient benefits from minimally invasive surgical protocols resulting in less pain, swelling and hematomas.

FEATURE

Biphasic Calcium Sulfate promotes angiogenesis.

Clinical studies done on Biphasic Calcium Sulfate feature a micro (0-10µm) and macro (50-500µm) porous structure, and an overall porosity of more than 40%. This allows for a high rate of angiogenesis, a key process in bone regeneration. Multiple studies have shown that Calcium Sulfate promotes vascularization and brings osteoblasts and growth factors into the site/grafted area.

The high rate of angiogenesis that occurs with Biphasic Calcium Sulfate is a key factor in healing process and the quick development of true, new bone.

READ MORE

Journal of Oral Implantology

Advances in Applied Ceramics

Expert Review of Medical Devices

CLINICAL EVIDENCE

Fig. 1

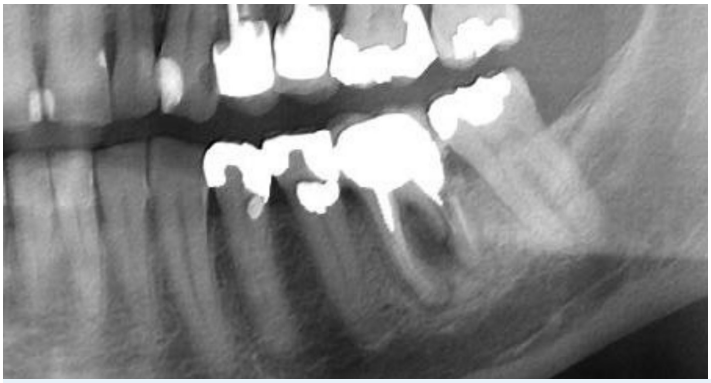
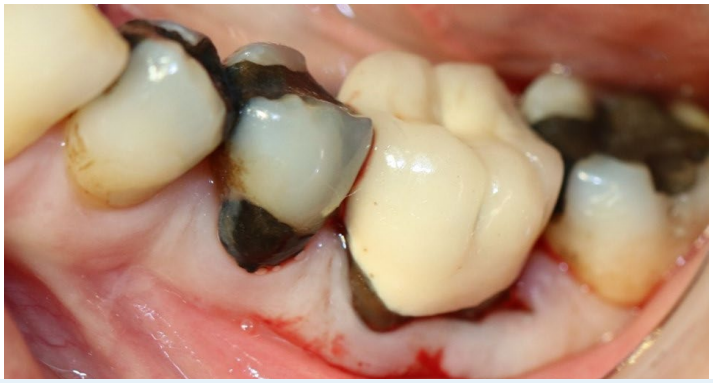


Fig. 2



#36 (19) presents a fractured root and a large bony lesion that is needed to be extracted.

Fig. 3

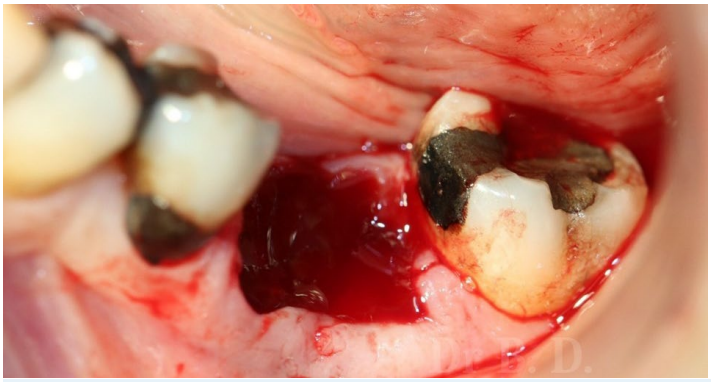
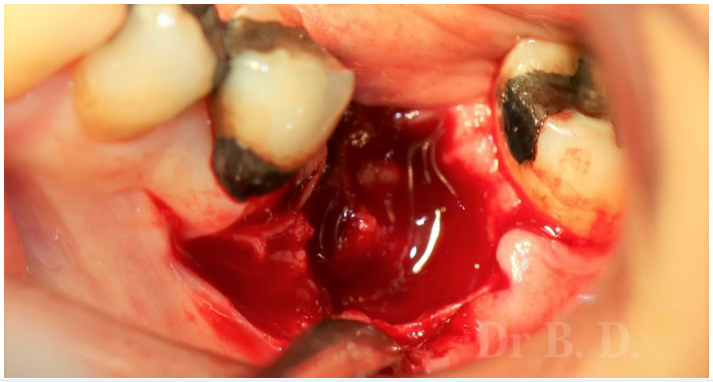


Fig. 4

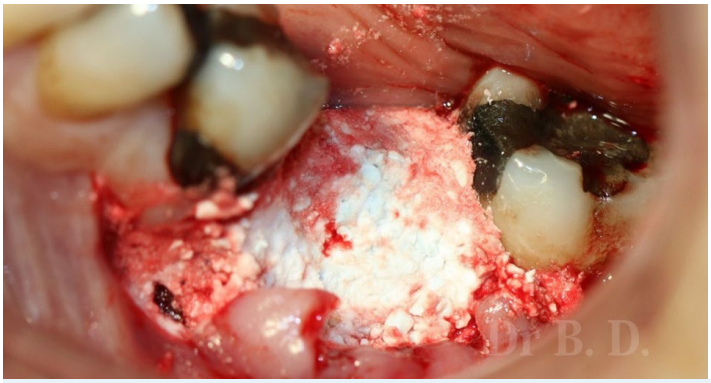


The blood clot should be preserved.

Do not aspirate the blood clot.

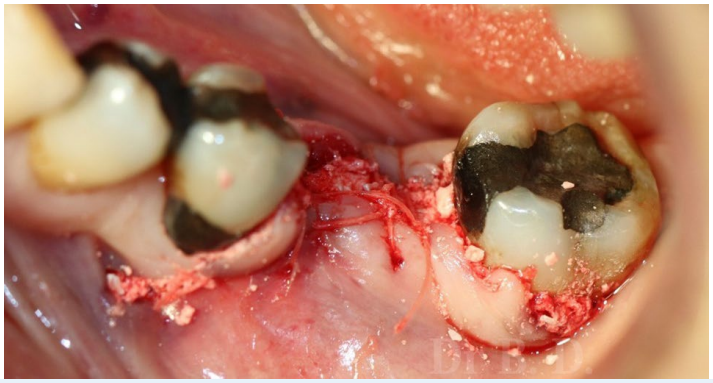
CLINICAL EVIDENCE

Fig. 5



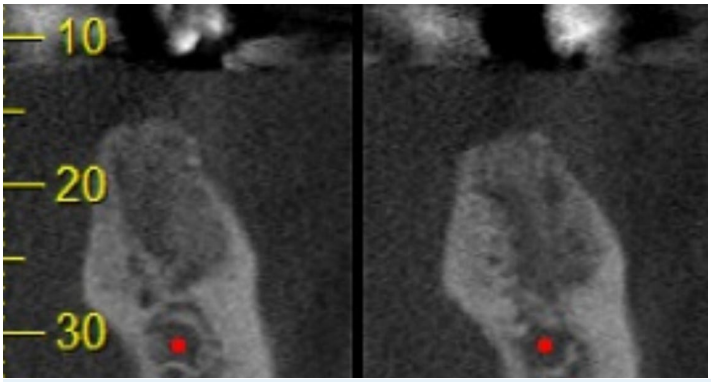
Bond Apatite® in place.

Fig. 6



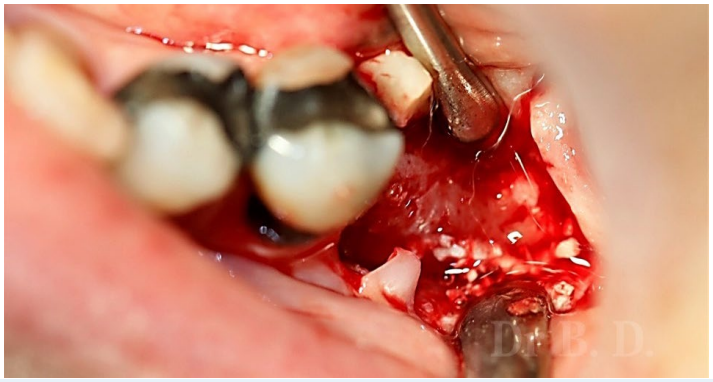
Flap closure with tension.

Fig. 7



CBCT – 3 months post-op.

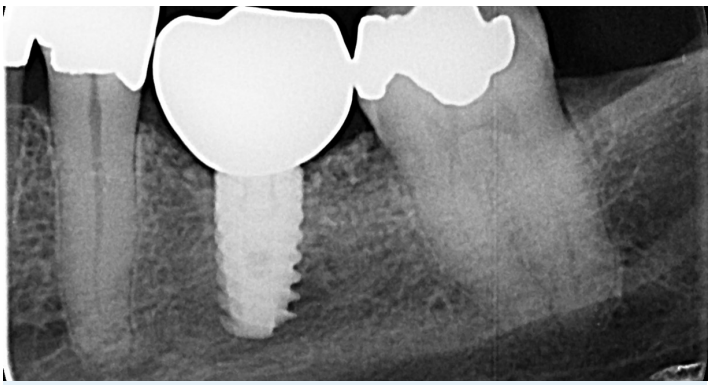
Fig. 8



Reentry – 3 months post-op.

CLINICAL EVIDENCE

Fig. 9

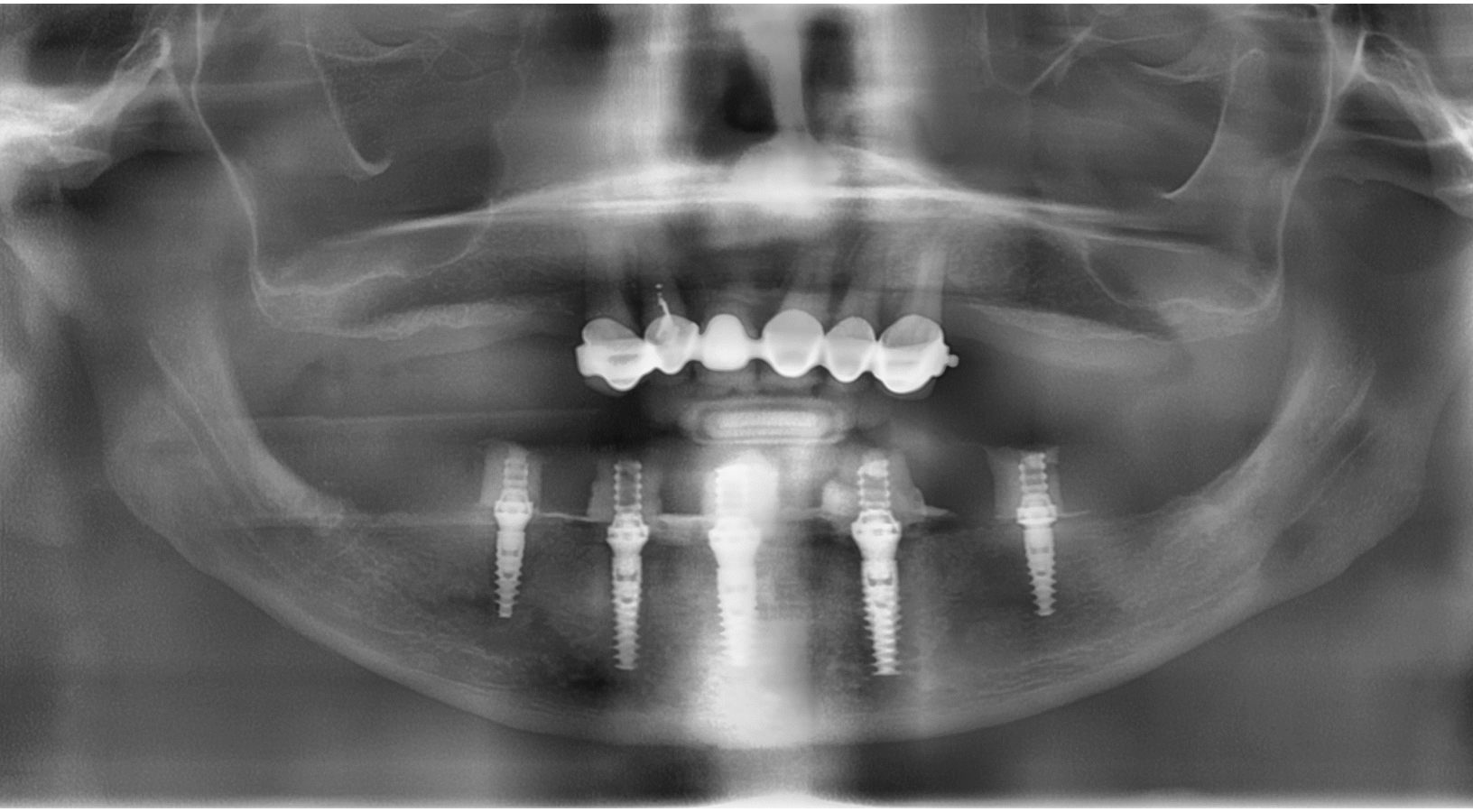


Periapical X-ray – 1 year post implant placement.

CONCLUSION

Calcium Sulfate chemical structure and its intra-structure porosity of more than 40% encourage growth factor infiltration, angiogenesis formation, and cell proliferation, all of which contribute to fast bone formation.

SECTION 3



Radiographic Appearance

Radiographic Appearance with Bond Apatite®

The radiographic appearance after using Bond Apatite® is quite different from that obtained with other types of grafts. Bond Apatite® does not behave as traditional grafts since it does not integrate with the bone, instead it reabsorbs and transforms into the patient own bone.

This progressive transformation over time is reflected in the radiographic appearance, therefore the radiographic appearance will appear radiopaque on day 1.

As the cement resorbs it is replaced by young bone osteoid matrix, which will appear radiolucent.

As the osteoid gets calcified, the bone tissue becomes dense and then it appears radiopaque again.

With time, trabeculation and cortical plate formation will take place. The bone defect will disappear and instead we will see continuity between the patient's bone and the newly regenerated bone.

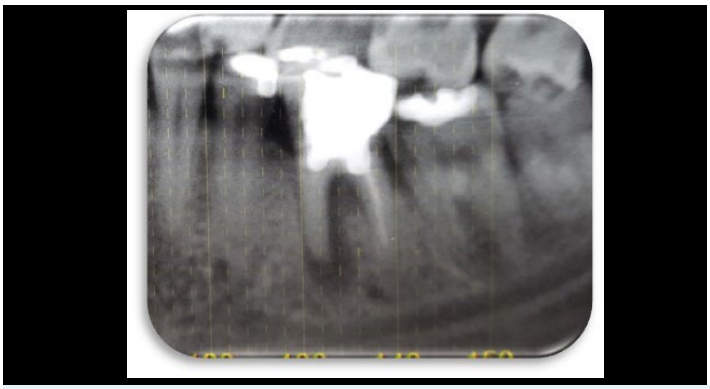
After 3-4 months, CBCT might underestimate the actual dimensions of bone formation as a new young bone is formed. This is because the bone is in the process of maturation.

Regarding the augmentation of the sinus floor by lateral approach, it is common to see clear radiological gaps after 3 months. These gaps represent immature bone that is still young and not yet calcified, however, after 5 months the bone will appear more radiopaque.

CLINICAL EVIDENCE

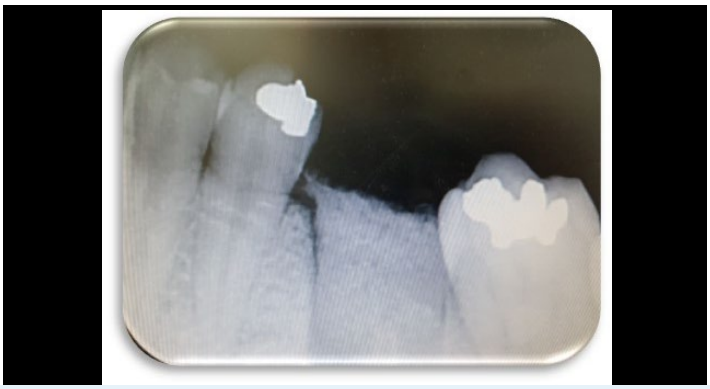
SOCKET GRAFTING

Fig. 1



Pre-op

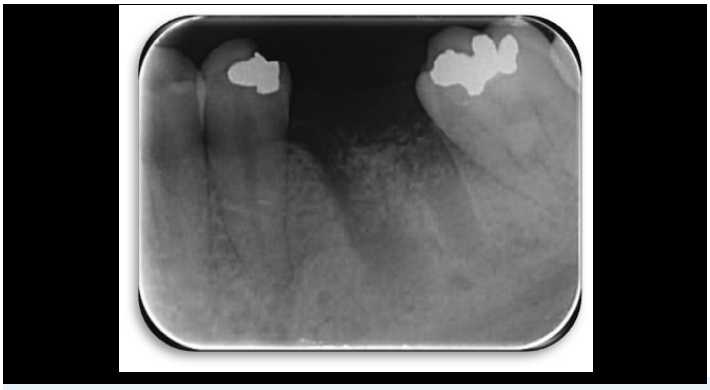
Fig. 2



Day of surgery.

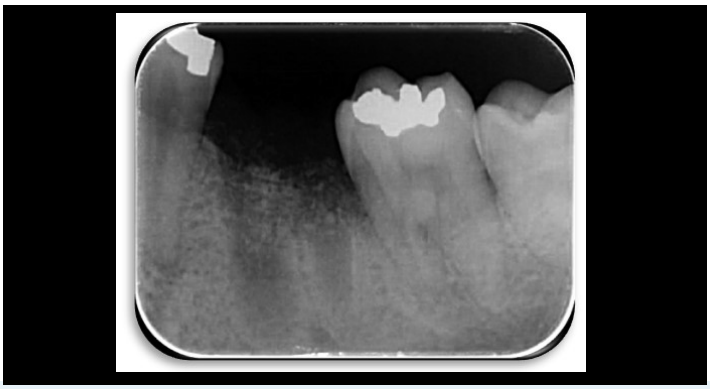
Immediate post-op.

Fig. 3



1 week post-op.

Fig. 4

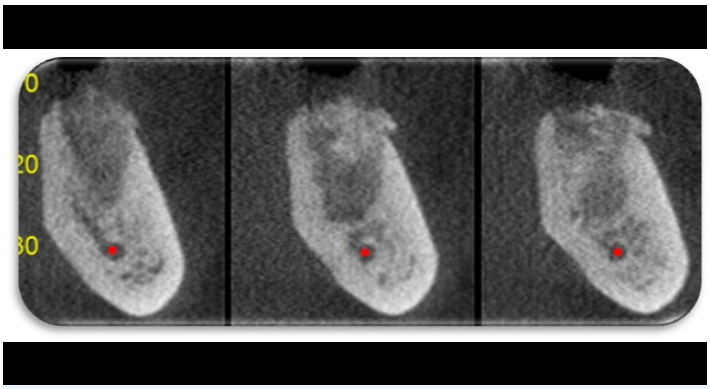


One month post-op.

CLINICAL EVIDENCE

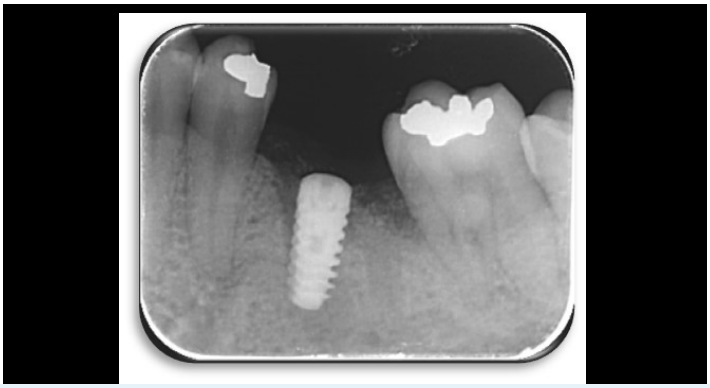
SOCKET GRAFTING

Fig. 5



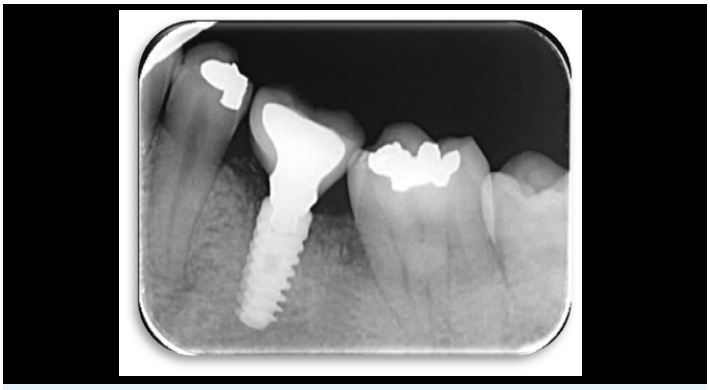
3 months post-op.

Fig. 6



X-ray 3 months post-op – implant in place.

Fig. 7

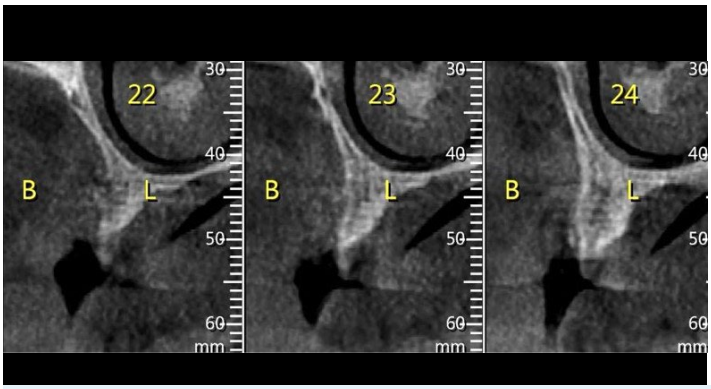


6 months post-op.

CLINICAL EVIDENCE

LATERAL AUGMENTATION

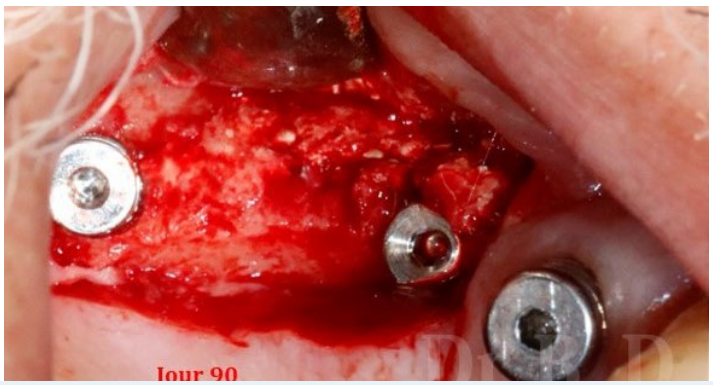
Fig. 1



CBCT – 3 months post lateral augmentation.

Note that the bone volume appears less than in the reentry (Fig. 2).

Fig. 2

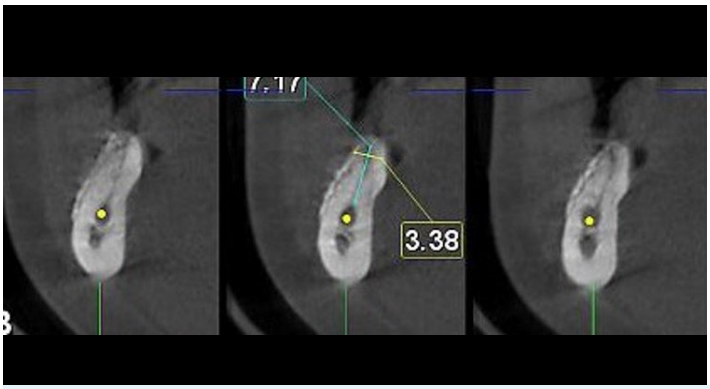


Reentry – 3 months post lateral augmentation and implant placement.

CLINICAL EVIDENCE

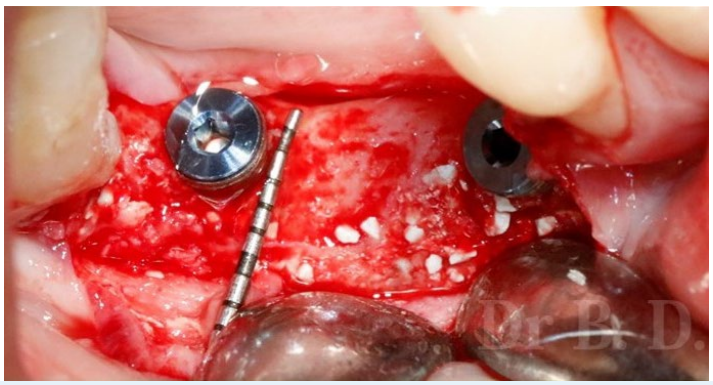
LATERAL AUGMENTATION

Fig. 3



CBCT – 3 months post-op.

Fig. 4



Reentry – 3 months post-op.

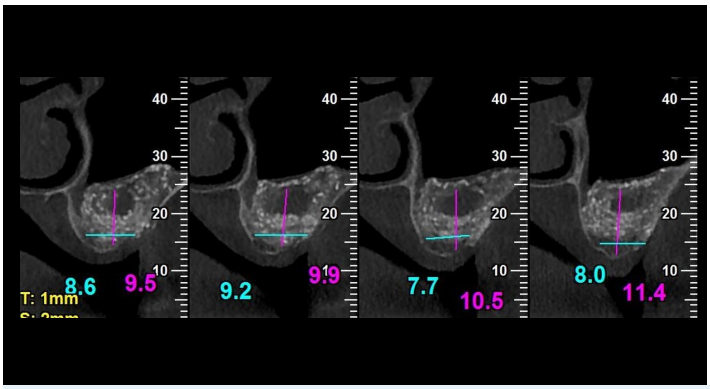
EXPERT TIPS

- Notice the differences between the CBCT and the clinical appearance upon reopening of the site.
- In lateral augmentation, it is recommended to view the CBCT 5 months post-op where we see higher levels of bone maturation and calcification.

CLINICAL EVIDENCE

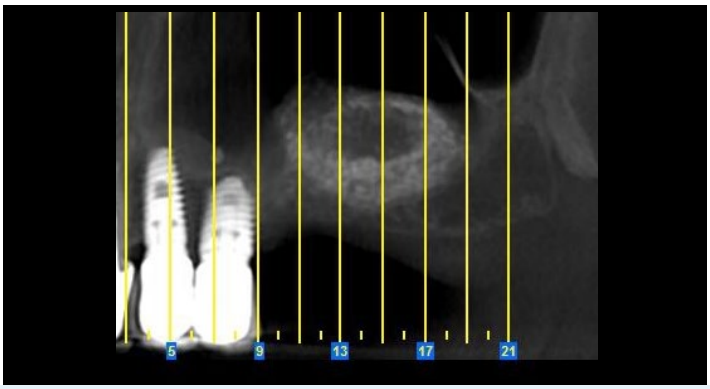
OPEN SINUS LIFT

Fig. 1



CBCT 3 months post-op.

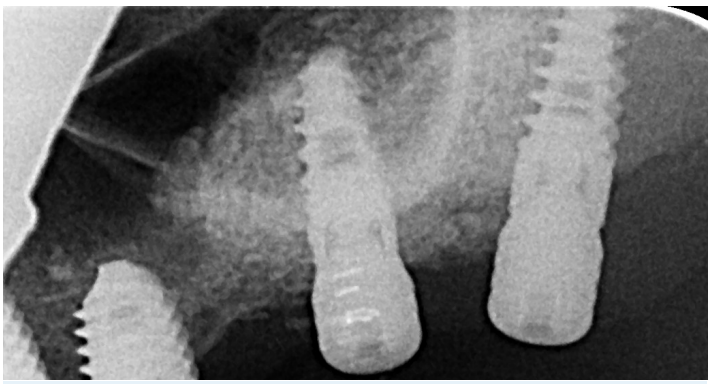
Fig. 2



CBCT panoramic view.

3 months post-op.

Fig. 3



CBCT

6 months post-op.

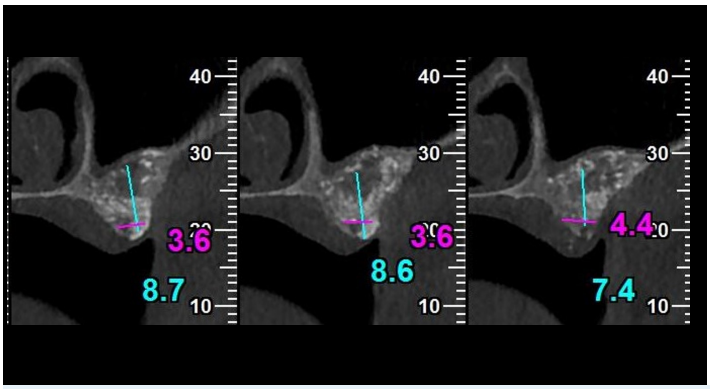
EXPERT TIPS

- The radiolucency appearing in *Fig. 1-2*, 3 months post-op is misleading.
- In fact, the bone is in the process of calcification which can be seen upon reentry.
- Radiography after 6-months illustrates the calcification process as seen in *Fig. 3*.

CLINICAL EVIDENCE

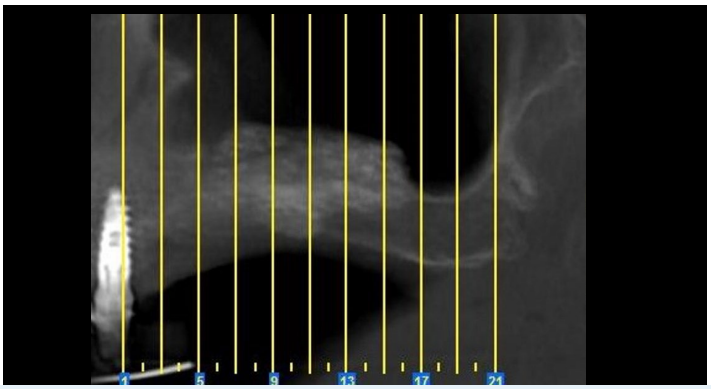
OPEN SINUS LIFT

Fig. 4



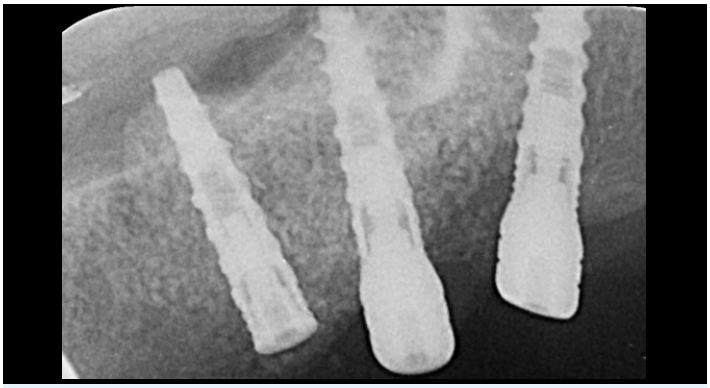
CBCT – 3 months post-op.

Fig. 5



CBCT 3 months post-op – Panoramic view.

Fig. 6

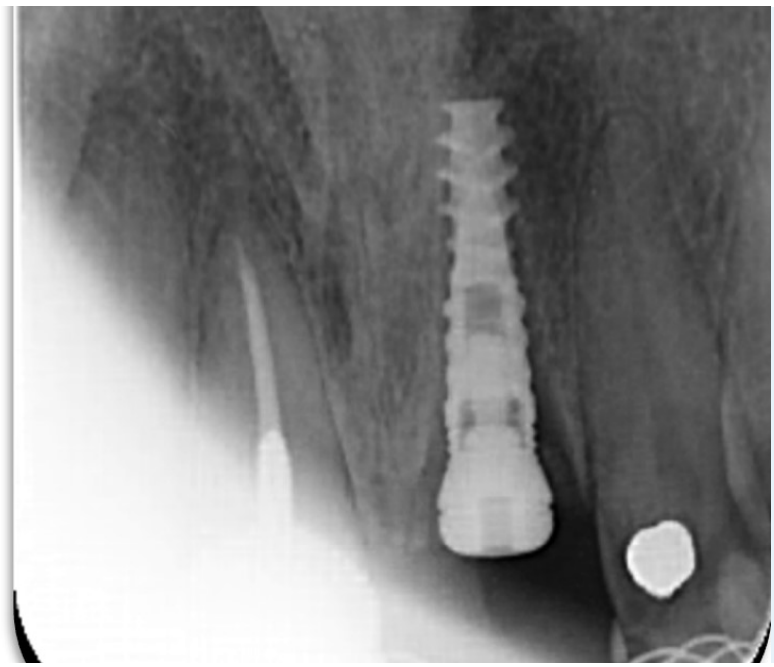


Periapical radiographic view – 6 months post-op.

CLINICAL EVIDENCE

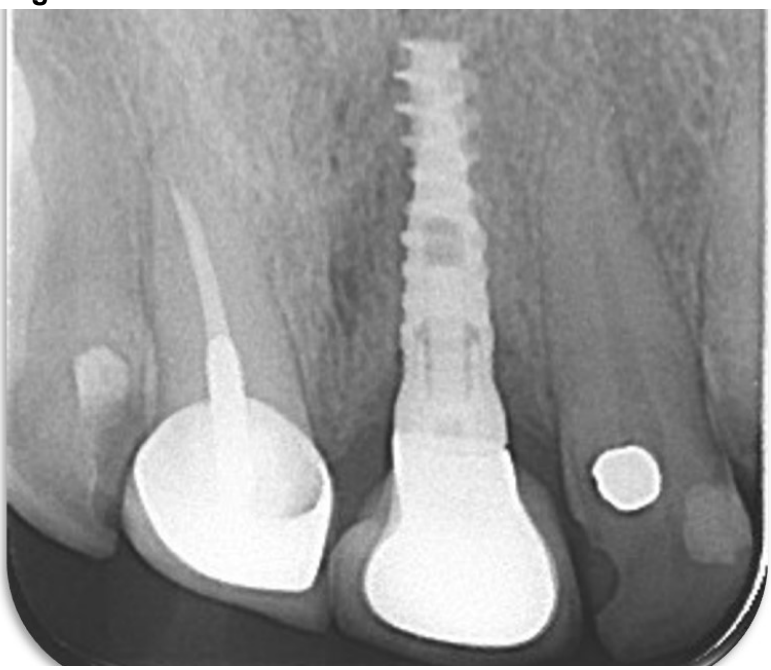
GAP FILLING

Fig. 1



X-ray, 3 weeks after placing Bond Apatite® around the implant.

Fig. 2

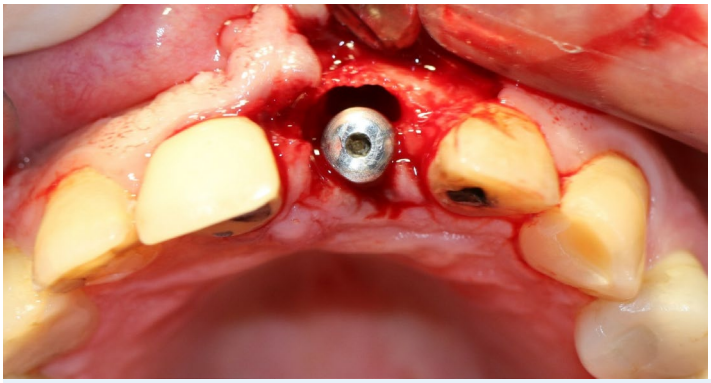


X-ray, 3 months after placing Bond Apatite® around the implant.

CLINICAL EVIDENCE

GAP FILLING

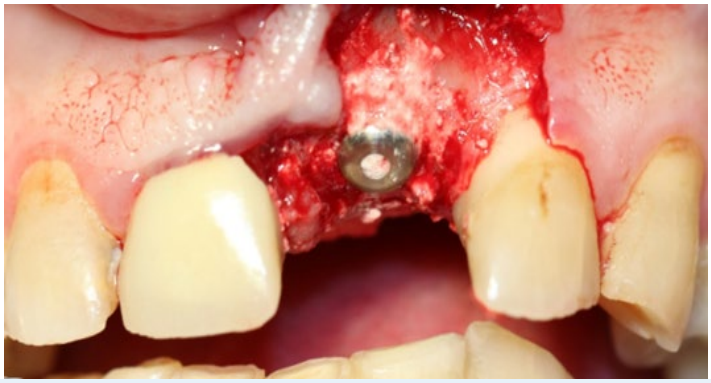
Fig. 1



Immediate implant placement in a socket.

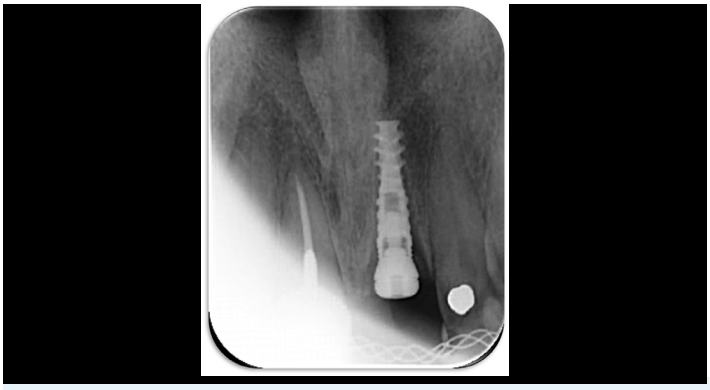
Notice the gap between the buccal plate and the implant.

Fig. 2



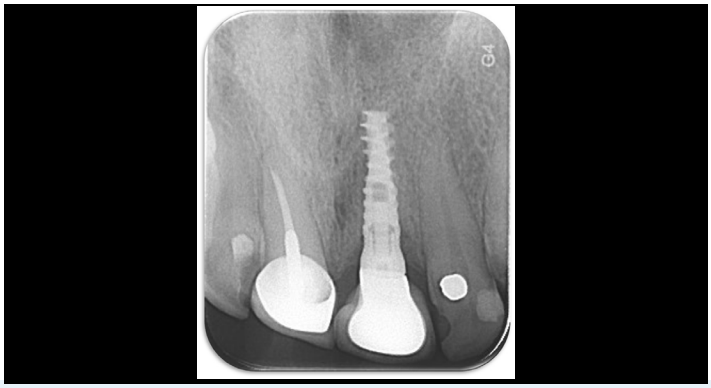
Bond Apatite® in place.

Fig. 3



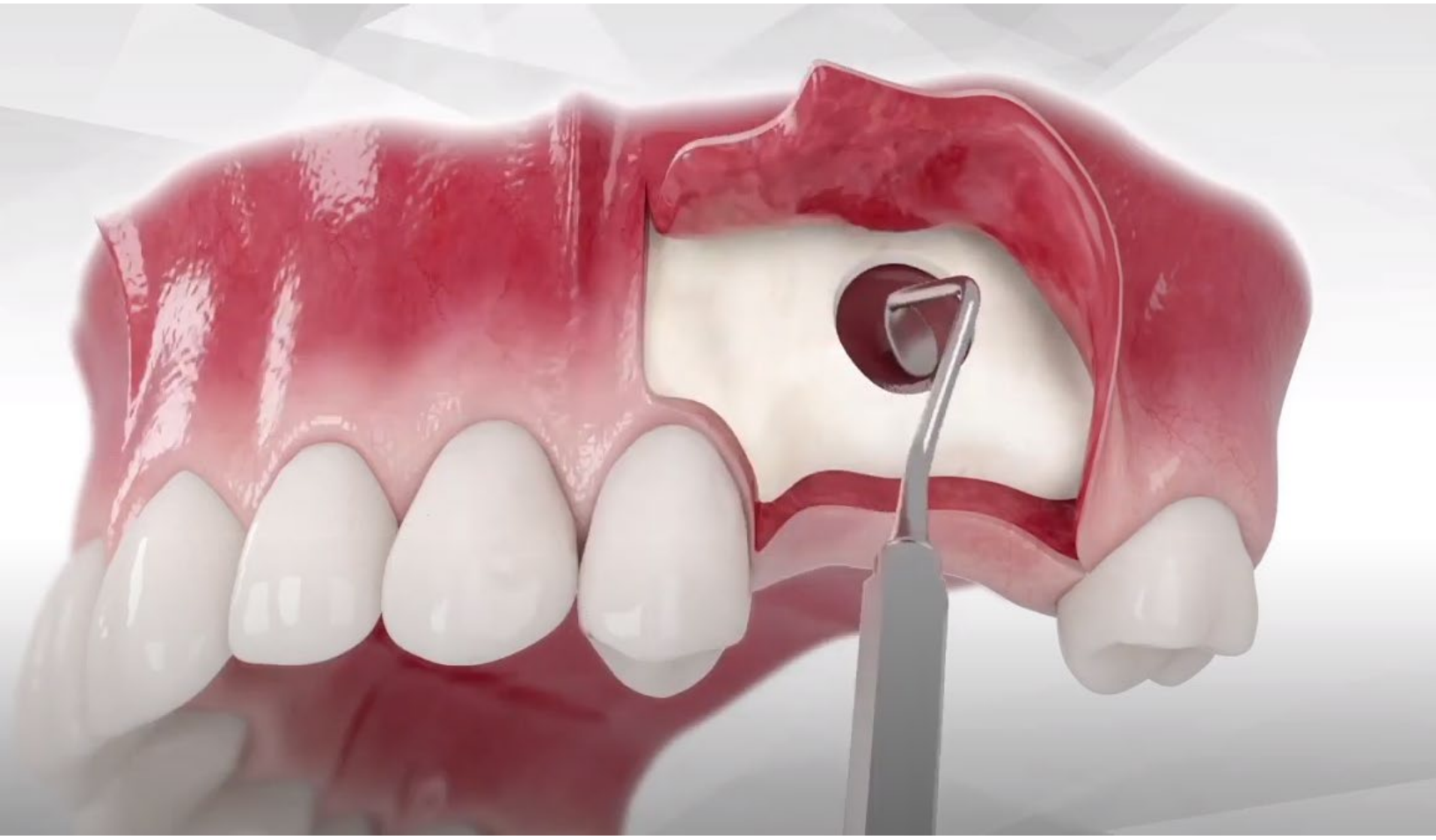
X-ray, 3 weeks after placing Bond Apatite® around the implant.

Fig. 4



X-ray, 3 months after placing Bond Apatite® around the implant.

SECTION 4



Surgical Bone Cement Protocols

Augmaflix

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Created for dental practitioners

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ABCA AUGMA BONE CEMENT ACADEMY | Augma™ BIOMATERIALS

SURGICAL PROTOCOL

Socket Preservation with 4 Bony Walls

Coverage with a collagen sponge or wound dressing

STEPS

Watch the protocol with a collagen sponge

Watch the protocol with a wound dressing

1. After extraction and complete debridement, activate and place the cement into the socket.
2. Place a dry, unfolded gauze above the cement and press firmly for 3 seconds, first with a finger and then with a periosteal elevator.
3. Protect the exposed cement with a suitable collagen sponge or a wound dressing.
4. Suture and secure the collagen sponge or wound dressing in place.

EXPERT TIPS

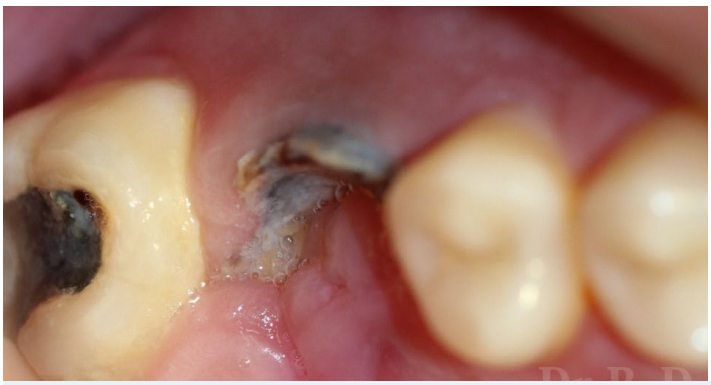
- Press firmly for 3 seconds with a dry gauze, first with a finger and then with a periosteal elevator.
- A suitable collagen sponge – a sponge that can last at least 7 days.
- The cement should be well compacted in the cervical zone, though filling the apex zone is not crucial.
- Secure the sponge in place to the surrounding soft tissue by an initial suture and thereafter with a cross-stitch.

CASE #1 – Coverage with a collagen sponge

CLINICAL EVIDENCE

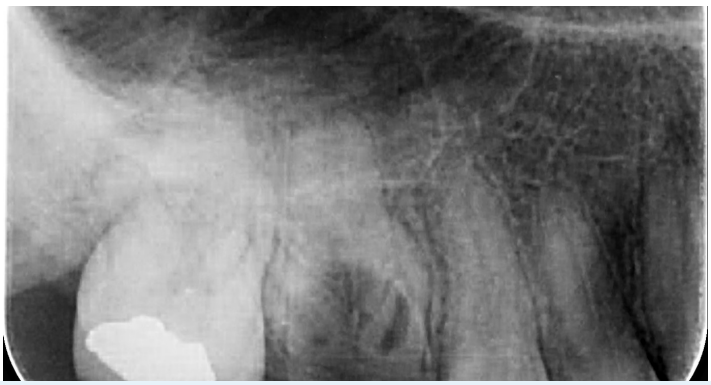
SOCKET GRAFTING WITH 4 BONY WALLS

Fig. 1



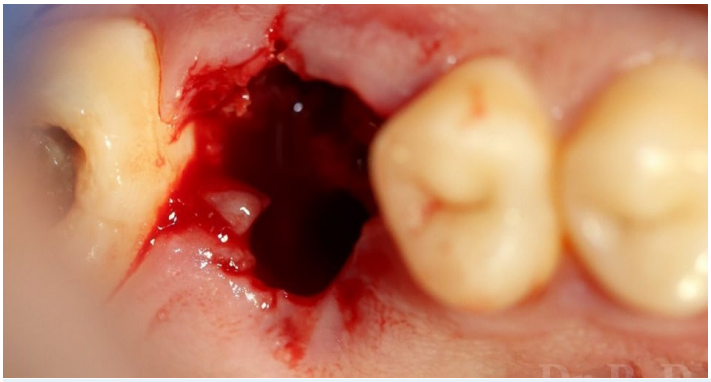
#16 (3) is to be extracted.

Fig. 2



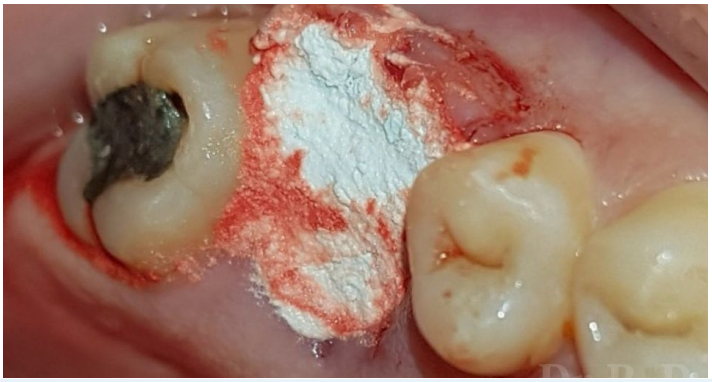
X-ray of #16 (3)'s large roots.

Fig. 3



After extraction, the height of the keratinized gingiva is important.

Fig. 4

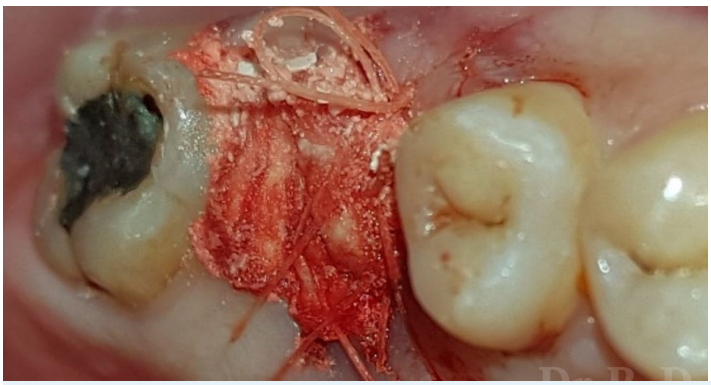


Bond Apatite® in place.

CASE #1 – Coverage with a collagen sponge

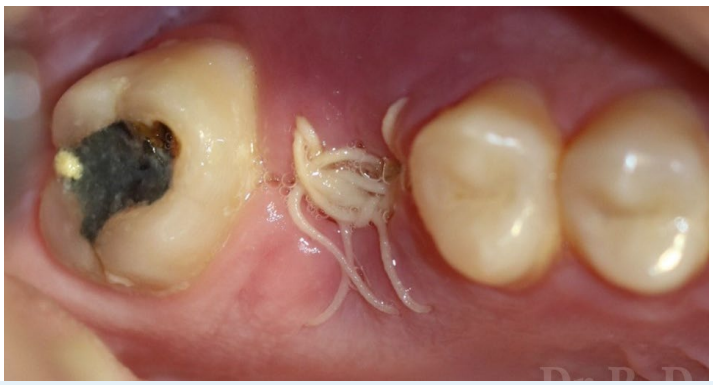
CLINICAL EVIDENCE | **SOCKET GRAFTING WITH 4 BONY WALLS**

Fig. 5



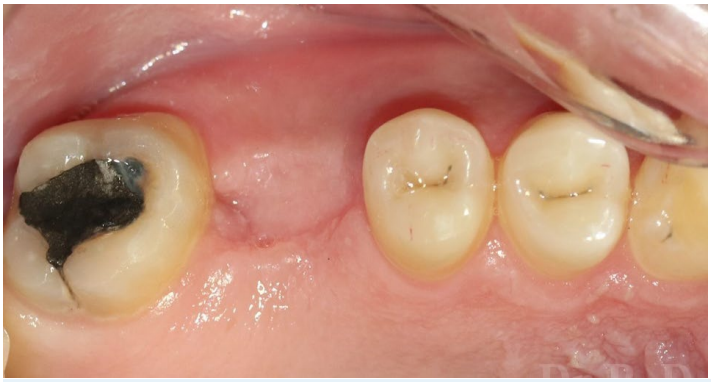
Collagen sponge sutured and secured in place, over Bond Apatite®.

Fig. 6



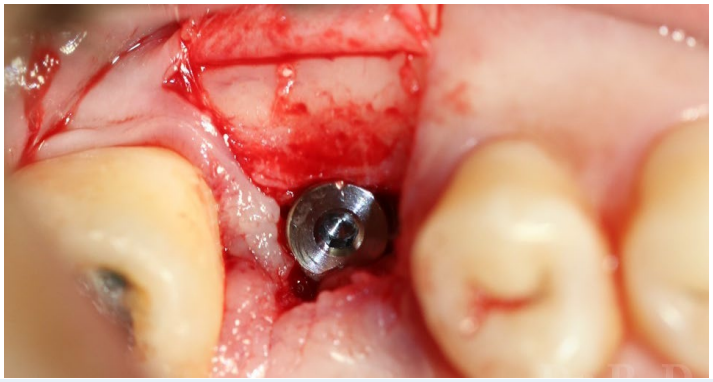
2 weeks post-op.

Fig. 7



4 weeks post-op – soft tissue appearance.

Fig. 8



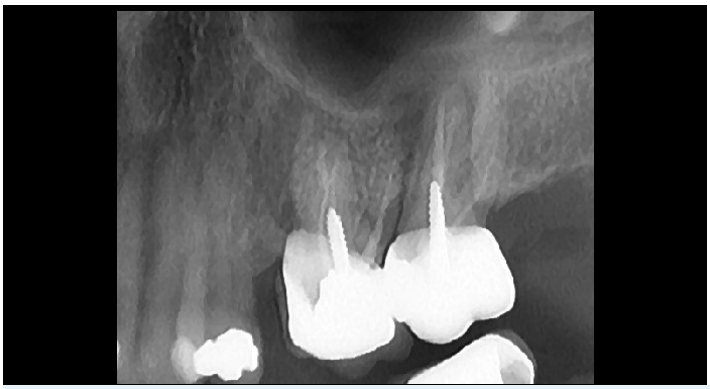
4 months post-op – Implant placement.

CASE #2 – Coverage with a collagen sponge

CLINICAL EVIDENCE

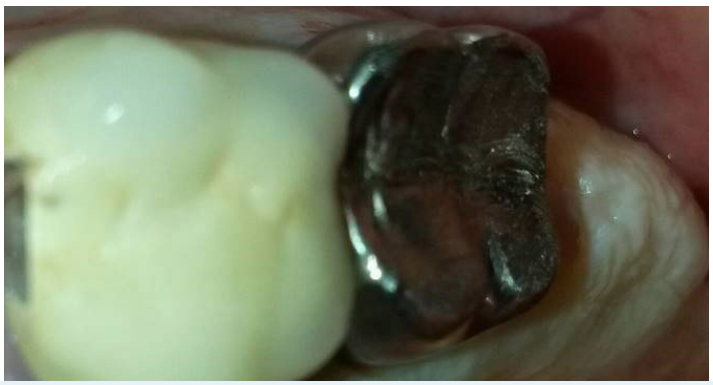
SOCKET GRAFTING WITH 4 BONY WALLS

Fig. 1



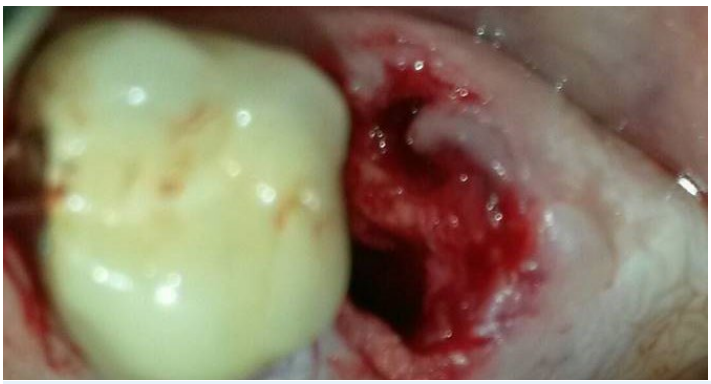
Pre-op radiography.

Fig. 2



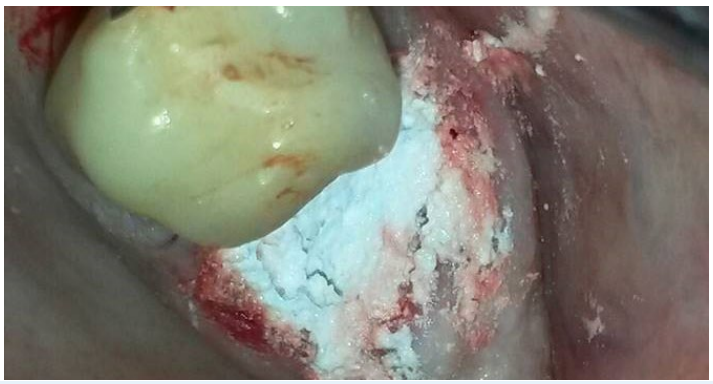
Pre-op.

Fig. 3



Extract the tooth and prepare the socket for grafting.

Fig. 4



Bond Apatite® in place.

CASE #2 – Coverage with a collagen sponge

CLINICAL EVIDENCE

SOCKET GRAFTING WITH 4 BONY WALLS

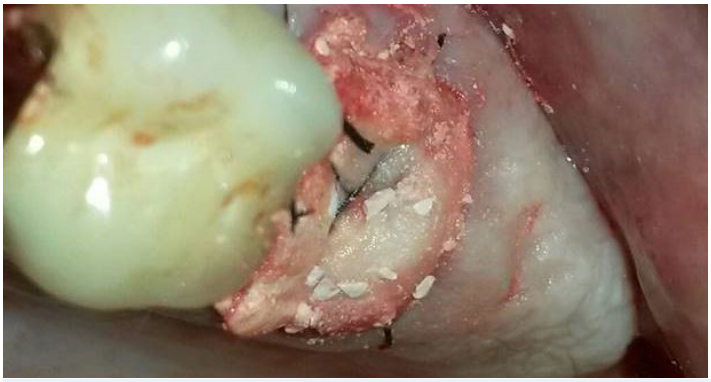
Fig. 5

Protect the cement by covering it with a collagen plug or sponge.

Fig. 6

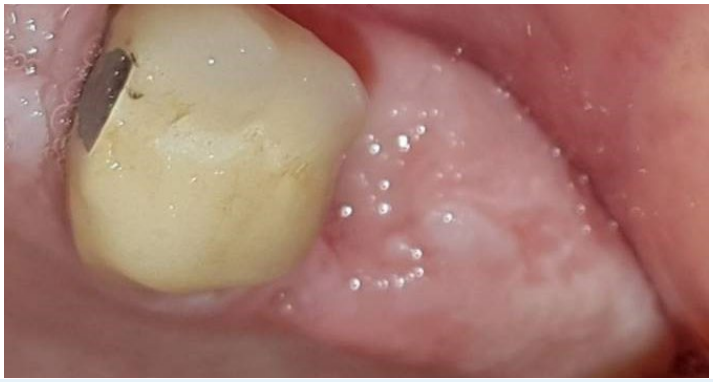
Secure the sponge in place to the surrounding soft tissue by an initial suture, thereafter with a cross suturing above.

Fig. 7



Due to exposure of more than 3mm, the cement is covered with a collagen sponge.

Fig. 8



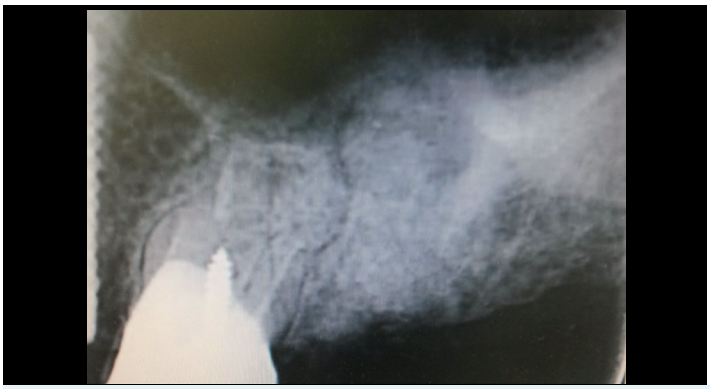
3 months post-op – soft tissue appearance.

CASE #2 – Coverage with a collagen sponge

CLINICAL EVIDENCE

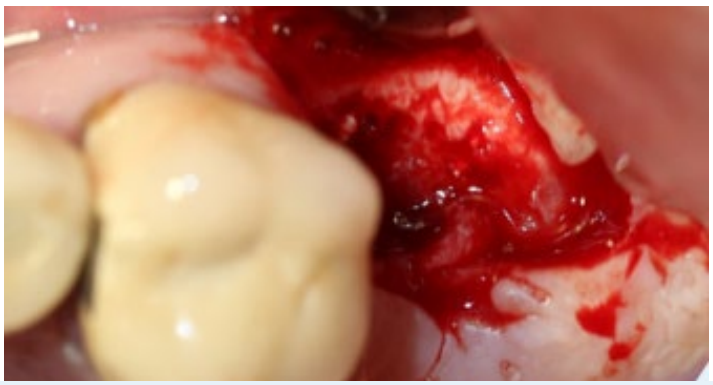
SOCKET GRAFTING WITH 4 BONY WALLS

Fig. 9



X-ray – 3 months post-op.

Fig. 10



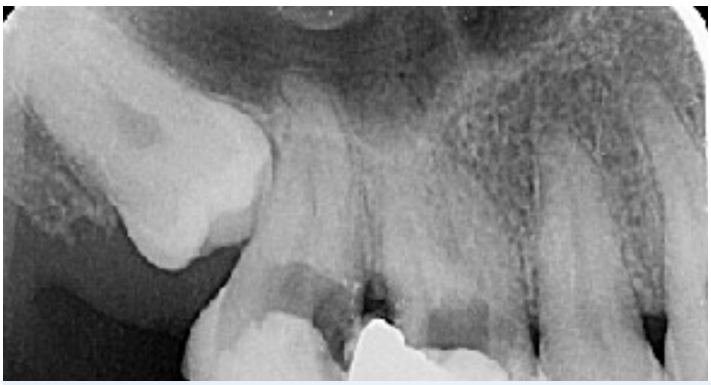
Reentry – 3 months post-op.

CASE #3 – Coverage with a collagen sponge

CLINICAL EVIDENCE

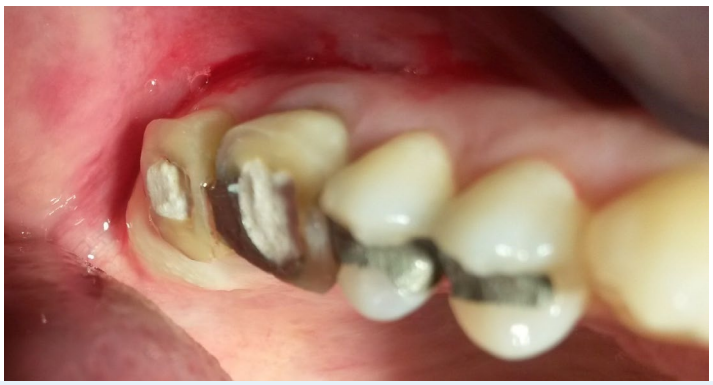
SOCKET GRAFTING WITH 4 BONY WALLS

Fig. 1



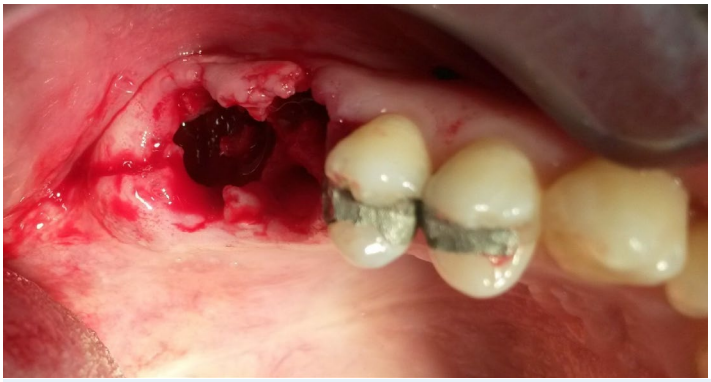
Pre-op radiography.

Fig. 2



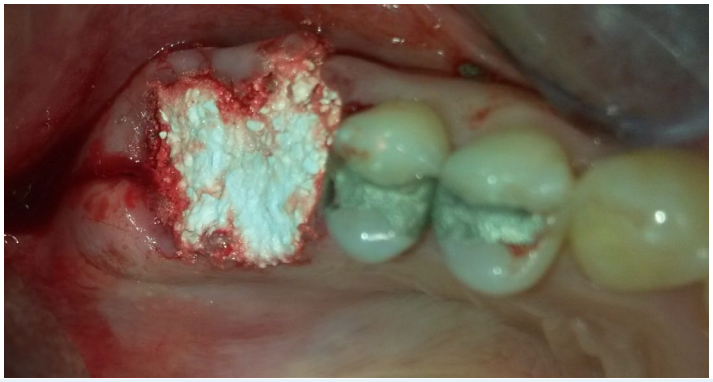
Pre-op.

Fig. 3



Extract the teeth and prepare the site for grafting.

Fig. 4

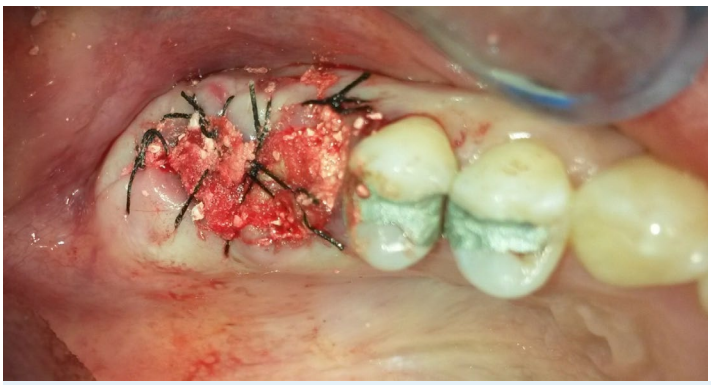


Bond Apatite® in place.

CASE #3 – Coverage with a collagen sponge

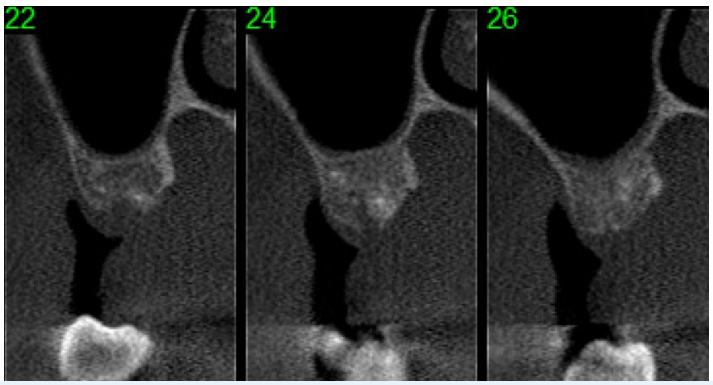
CLINICAL EVIDENCE | **SOCKET GRAFTING WITH 4 BONY WALLS**

Fig. 5



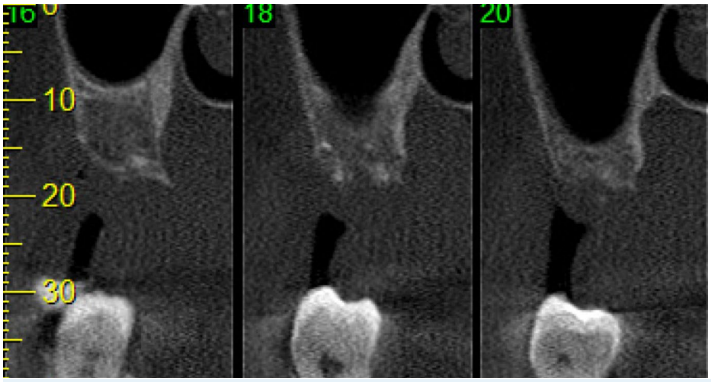
Collagen sponge secured in place.

Fig. 6



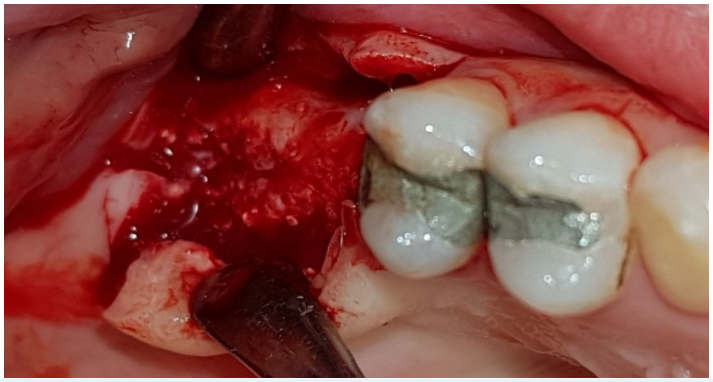
CBCT 4 months post-op.

Fig. 7



CBCT 4 months post-op.

Fig. 8



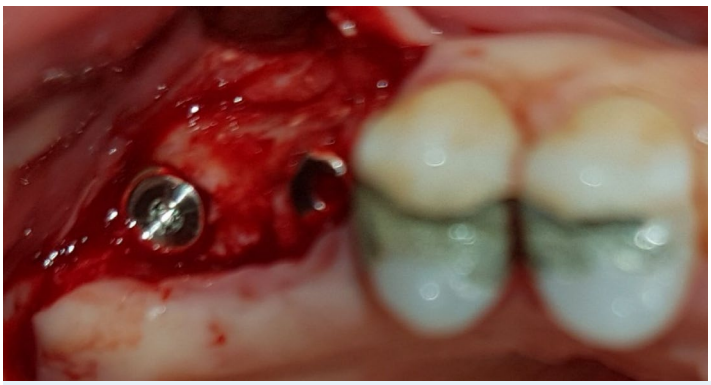
Reentry 4 months post-op.

CASE #3 – Coverage with a collagen sponge

CLINICAL EVIDENCE

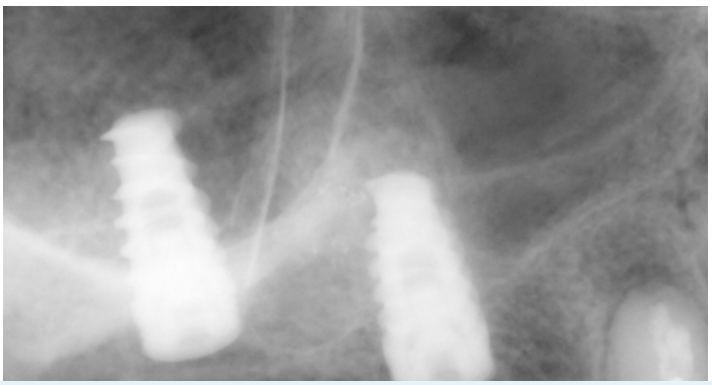
SOCKET GRAFTING WITH 4 BONY WALLS

Fig. 9



Implants in place.

Fig. 10



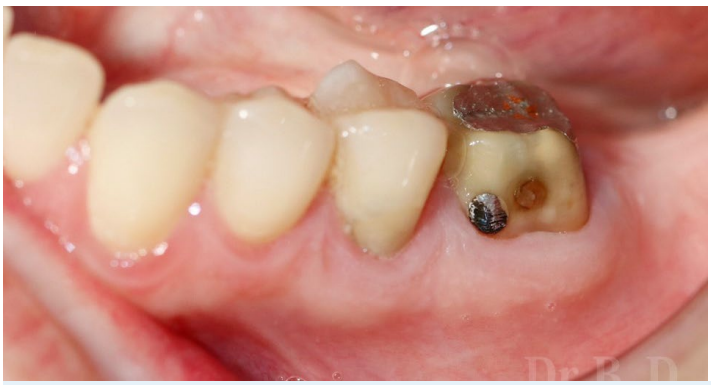
Implants in place.

CASE #4 – Coverage with a wound dressing

CLINICAL EVIDENCE

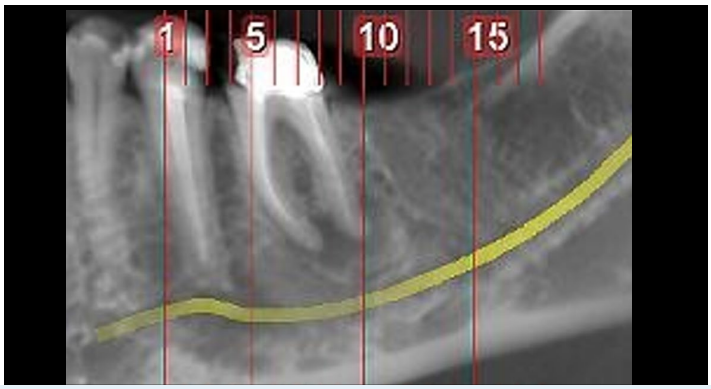
SOCKET GRAFTING WITH 4 BONY WALLS

Fig. 1



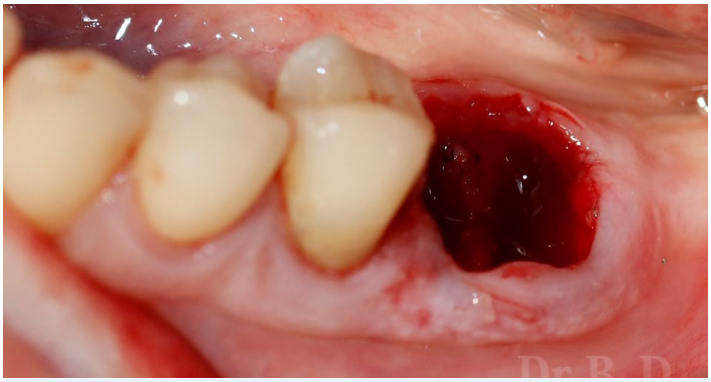
#36 (19) needed to be extracted.

Fig. 2



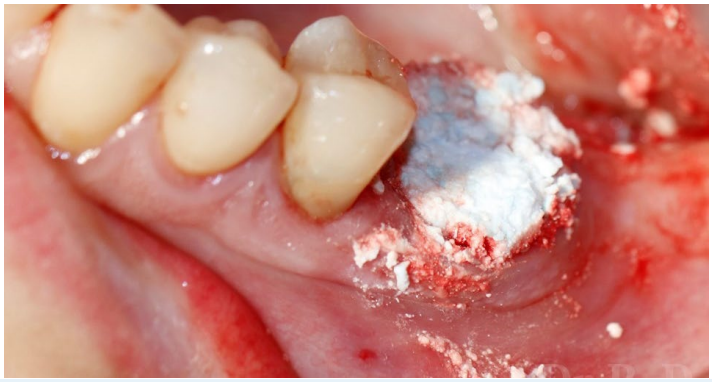
Radiographic appearance before extraction.

Fig. 3



After extraction, we verified the presence of the 4 bony walls.

Fig. 4



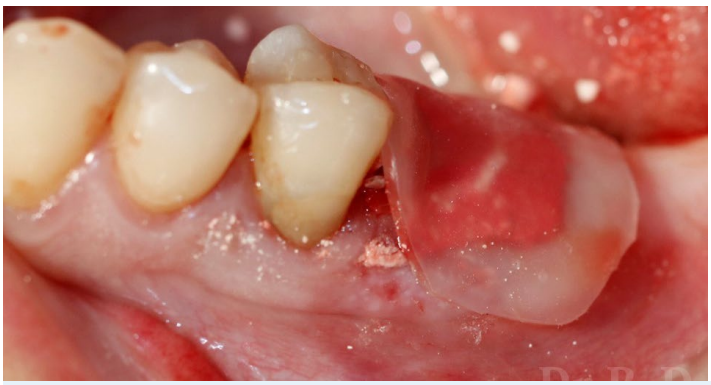
Bond Apatite® in place.

CASE #4 – Coverage with a wound dressing

CLINICAL EVIDENCE

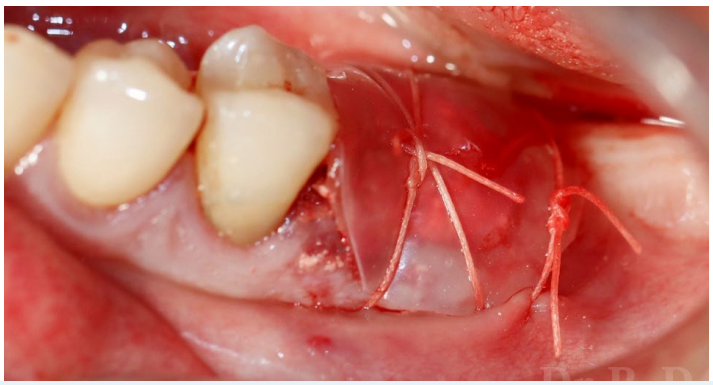
SOCKET GRAFTING WITH 4 BONY WALLS

Fig. 5



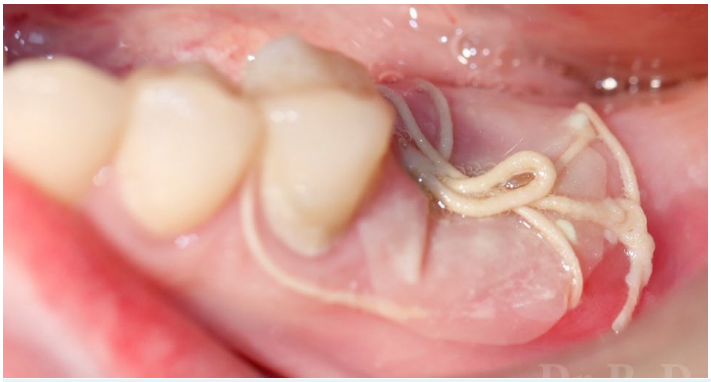
The Bond Apatite® is covered with the wound dressing.

Fig. 6



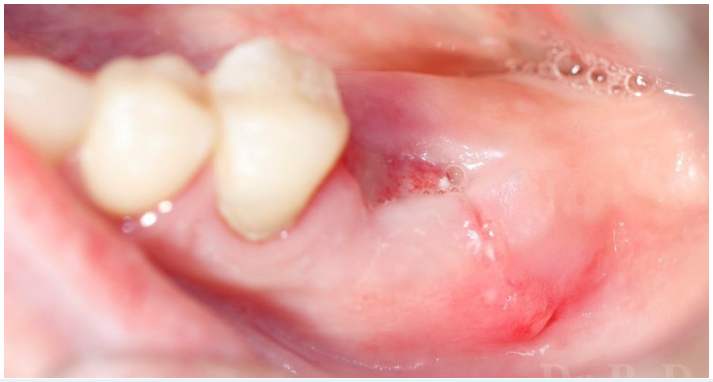
Sutures over the wound dressing to hold it in place.

Fig. 7



1 week post-op. Notice the rapid proliferation of soft tissue.

Fig. 8



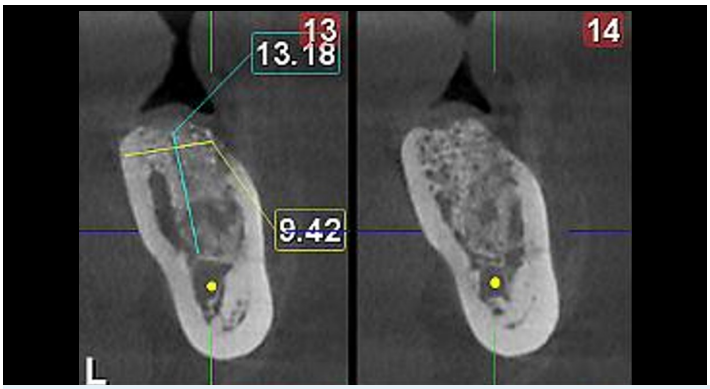
2 weeks post-op – soft tissue appearance.

CASE #4 – Coverage with a wound dressing

CLINICAL EVIDENCE

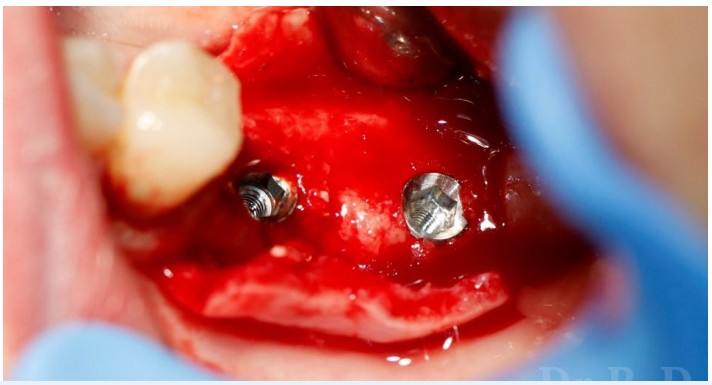
SOCKET GRAFTING WITH 4 BONY WALLS

Fig. 9



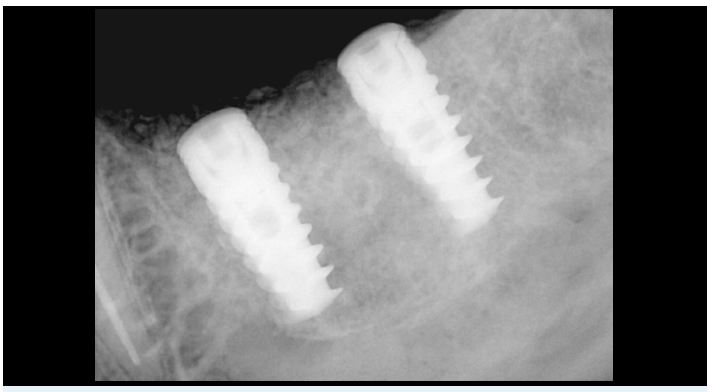
CBCT 3 months post-op showing a true bone regeneration.

Fig. 10



Reentry - 3 months post op. Implant placement in a young, vascularized bone.

Fig. 11



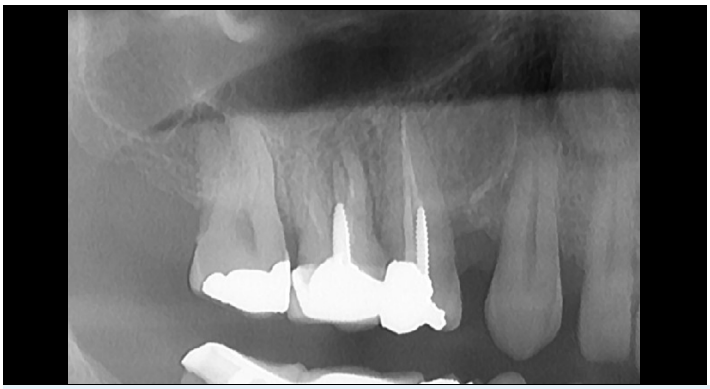
Immediate X-ray post implant placement.

CASE #5 – Coverage with a wound dressing

CLINICAL EVIDENCE

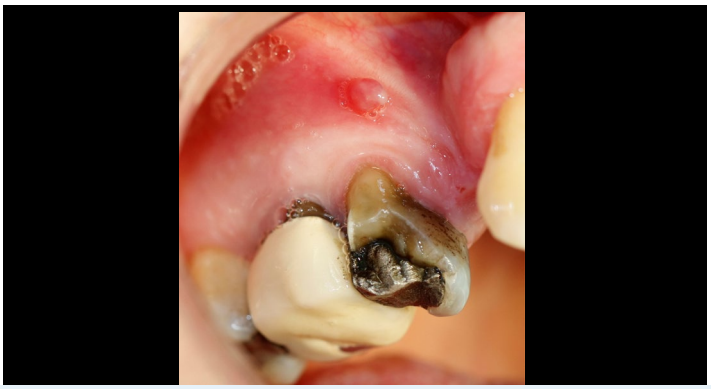
SOCKET GRAFTING WITH 4 BONY WALLS

Fig. 1



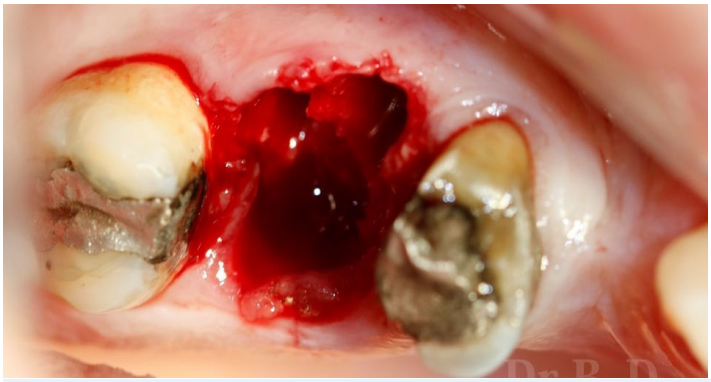
#16 (3) with fractured root and large lesion is needed to be extracted.

Fig. 2



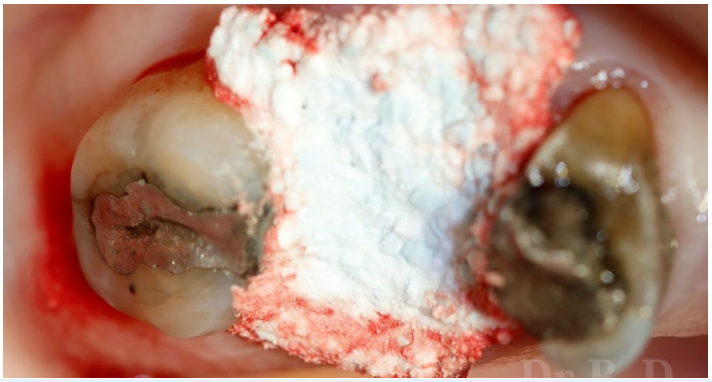
The height of keratinized gingiva is a reason for not advancing the flap, leaving the Bond Apatite® exposed and protected by the wound dressing until soft tissue proliferation takes place.

Fig. 3



Socket after extraction.

Fig. 4



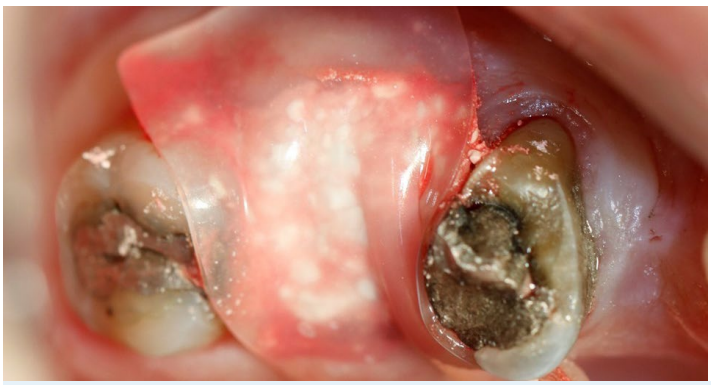
Bond Apatite® in place, before removing excess.

CASE #5 – Coverage with a wound dressing

CLINICAL EVIDENCE

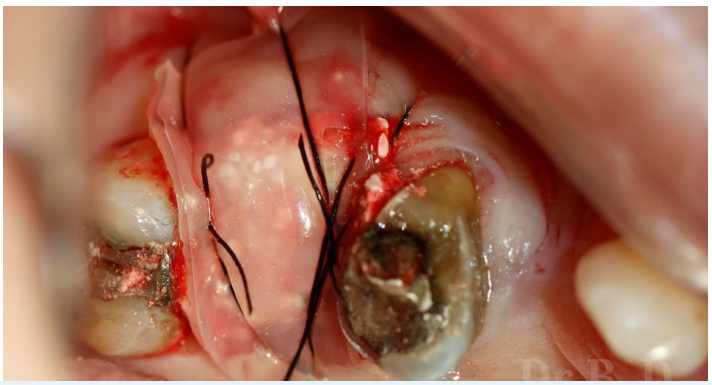
SOCKET GRAFTING WITH 4 BONY WALLS

Fig. 5



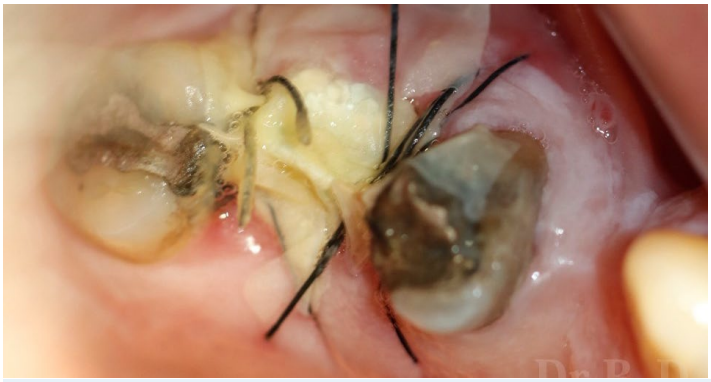
The wound dressing sticks above the soft tissue.

Fig. 6



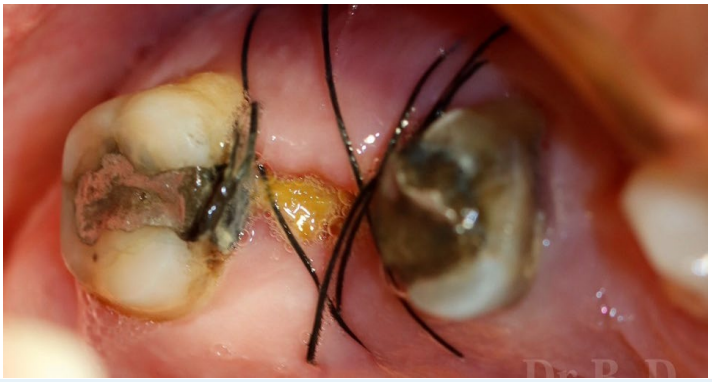
Sutures over the wound dressing.

Fig. 7



1 week post-op.

Fig. 8



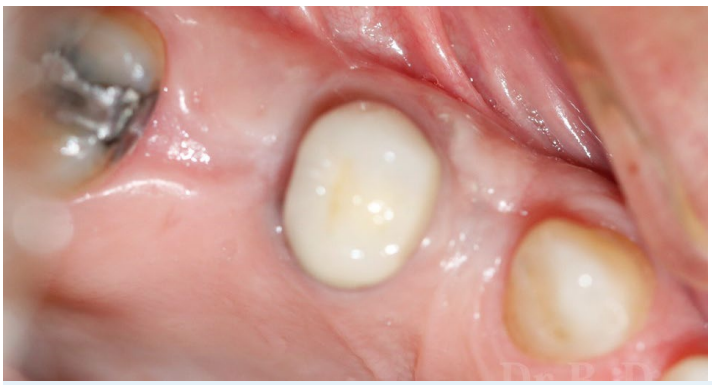
2 weeks post-op.

CASE #5 – Coverage with a wound dressing

CLINICAL EVIDENCE

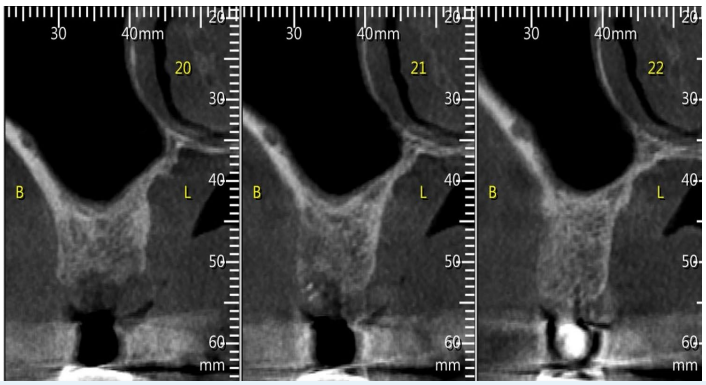
SOCKET GRAFTING WITH 4 BONY WALLS

Fig. 9



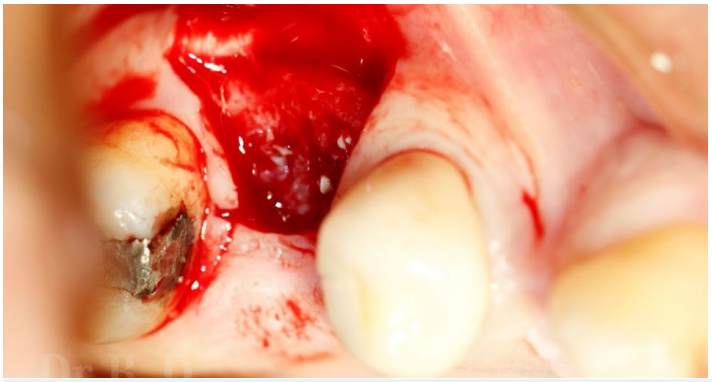
3 months post-op – soft tissue appearance.

Fig. 10



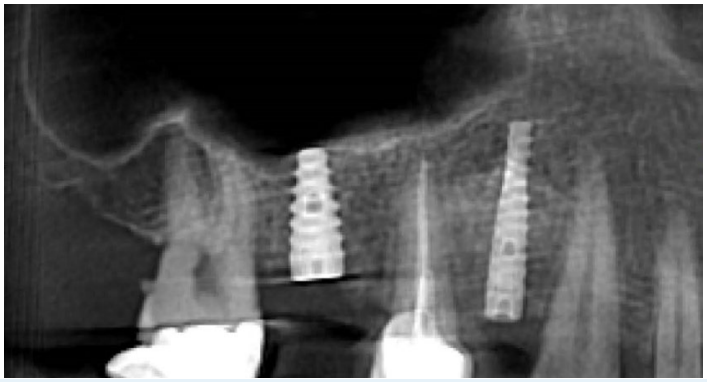
CBCT 3 months post-op – Bone regeneration can be seen.

Fig. 11



Reentry 3 months post-op. Well vascularized new bone can be seen with a few particles of HA on the surface.

Fig. 12



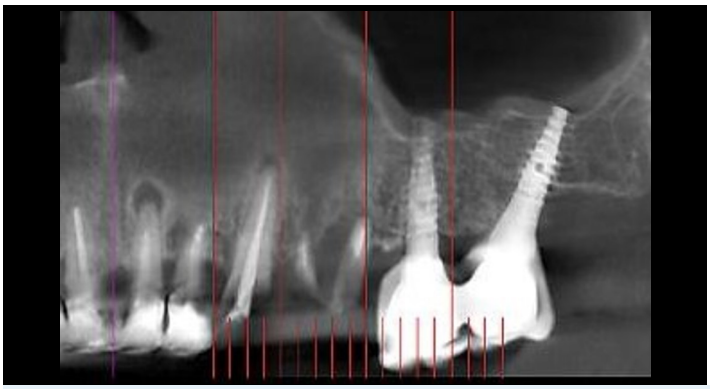
X-ray 3 months post implant placement.

CASE #6 – Coverage with a wound dressing

CLINICAL EVIDENCE

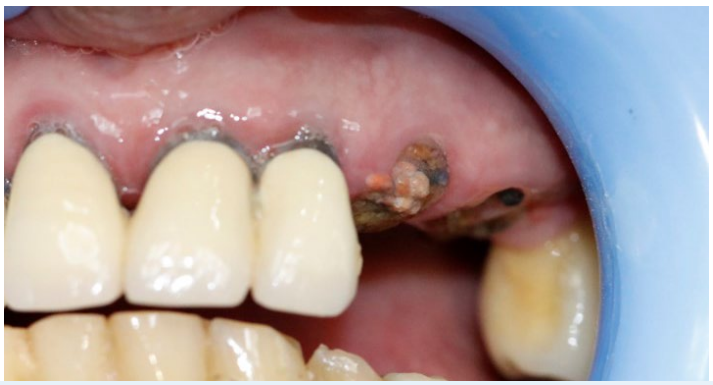
SOCKET GRAFTING WITH 4 BONY WALLS

Fig. 1



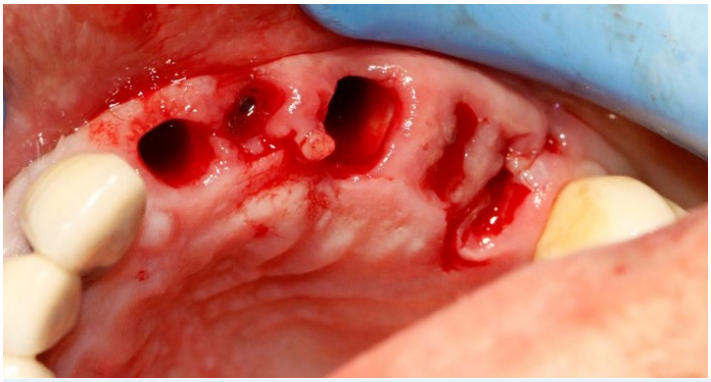
#21 (9), #22 (10), #23 (11), #24 (12), and #25 (13) are to be extracted.

Fig. 2



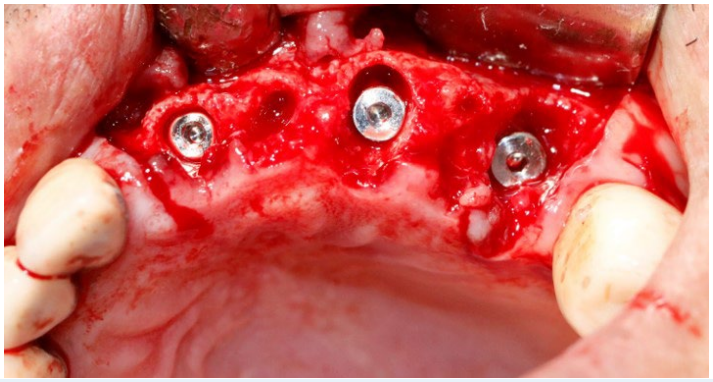
All extractions will take place at the same time.

Fig. 3



Extractions performed.

Fig. 4



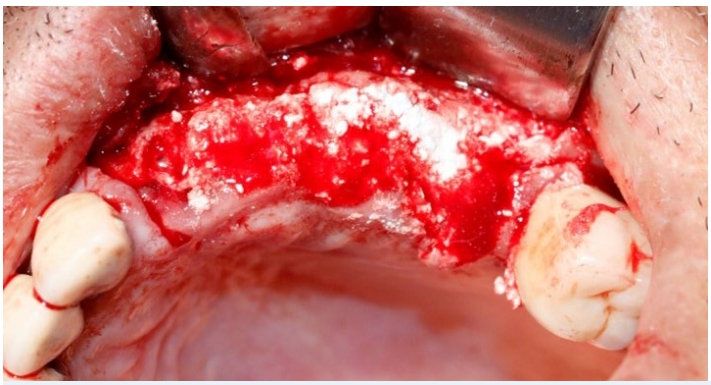
Implants in place. Primary closure could not be achieved.

CASE #6 – Coverage with a wound dressing

CLINICAL EVIDENCE

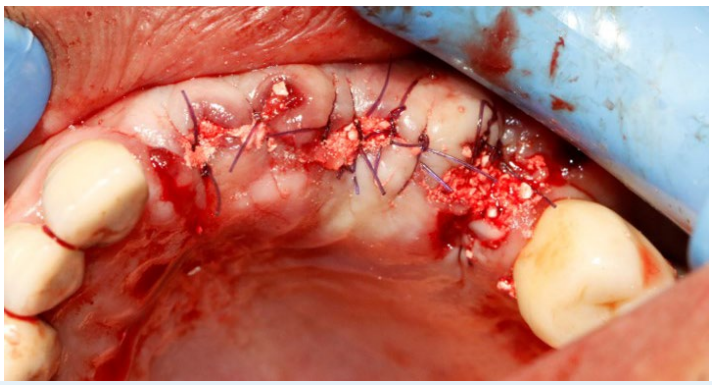
SOCKET GRAFTING WITH 4 BONY WALLS

Fig. 5



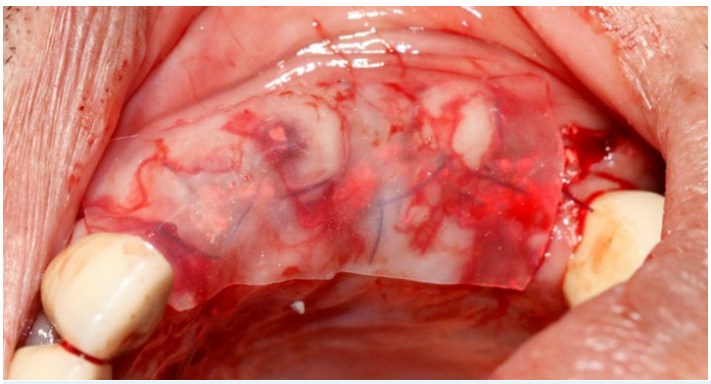
Bond Apatite® in place.

Fig. 6



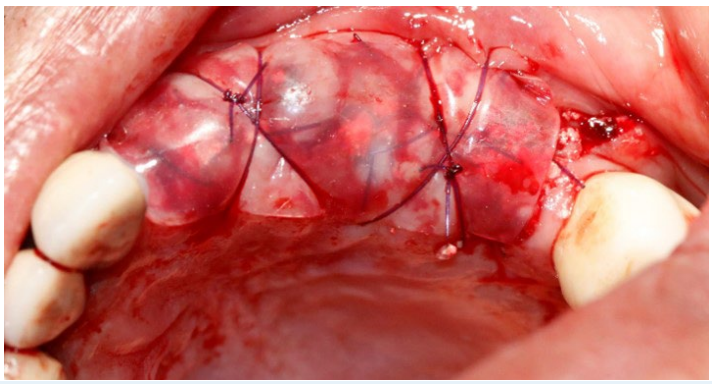
Some of the Bond Apatite® was not covered.

Fig. 7



Placing of the wound dressing after cleaning the mucosa with a dry gauze followed by a moist gauze.

Fig. 8



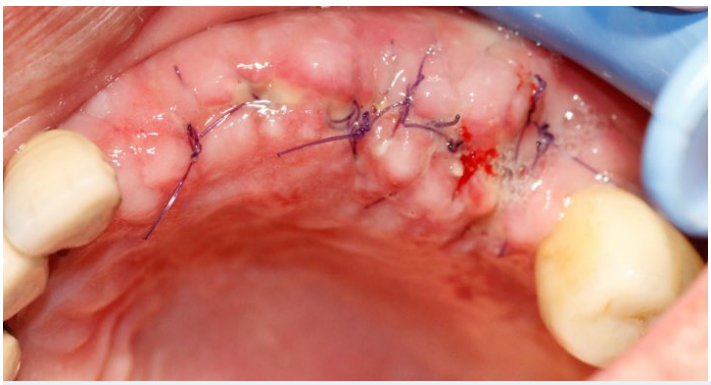
Sutures of the wound dressing in an X to stabilize it in place.

CASE #6 – Coverage with a wound dressing

CLINICAL EVIDENCE

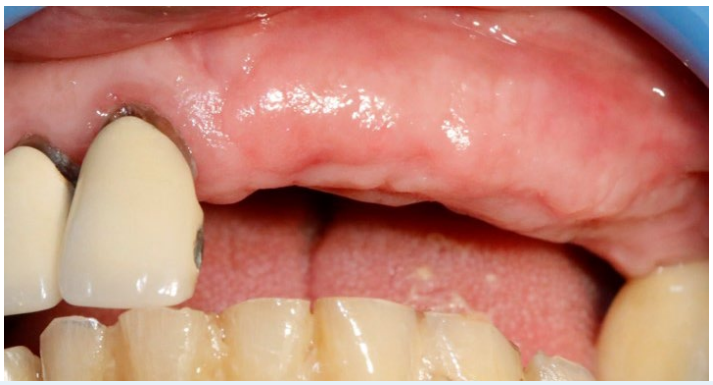
SOCKET GRAFTING WITH 4 BONY WALLS

Fig. 9



Fast healing after one week.

Fig. 10



3 months post-op – showing perfect healing.

EXPERT TIPS

More than 3mm of exposed cement should be protected and secured by a collagen sponge or a wound dressing.

LEARN MORE

SOCKET GRAFTING WITH 4 BONY WALLS

INTRUCTIONAL VIDEO
WITH COLLAGEN SPONGE

ANIMATED PROTOCOL

ON-DEMAND WEBINAR

LIVE SURGERY
WITH WOUND DRESSING

SURGICAL PROTOCOL

Socket Preservation without 4 Bony Walls

STEPS

Watch the video

1. Perform mesial oblique vertical incision (up to 2-3 mm beyond the MGJ into the mobile mucosa).
2. Raise full thickness flap, minimally as needed to expose the entire defect.
3. Clean the socket.
4. Place the cement.
5. Reposition the flap for maximal closure with tension.
6. Suture.

EXPERT TIPS

- Press firmly for 3 seconds, with a finger above a dry gauze.
- Then exert additional pressure for few seconds on the gauze with a periosteal elevator.
- The material should be well compacted from all directions, buccally and occlusally.

No soft tissue manipulation should be performed to gain a tension free flap. The flap is stretched for closure. Therefore, no periosteal releasing incision

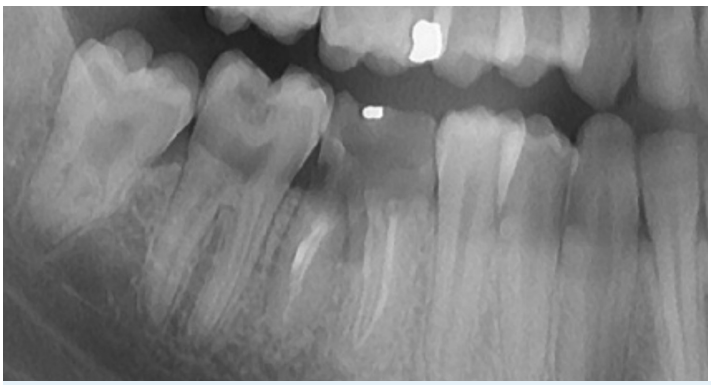
Suturing: Start from mesial, then distal, then in the middle, after that sutures can be placed in between.

CASE #1

CLINICAL EVIDENCE

SOCKET GRAFTING WITHOUT 4 BONY WALLS

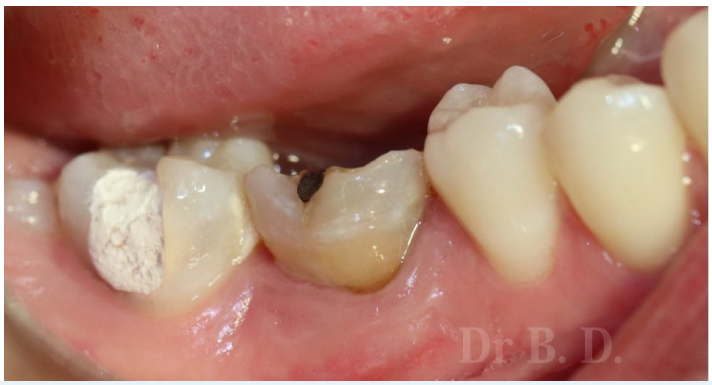
Fig. 1



Pre-op

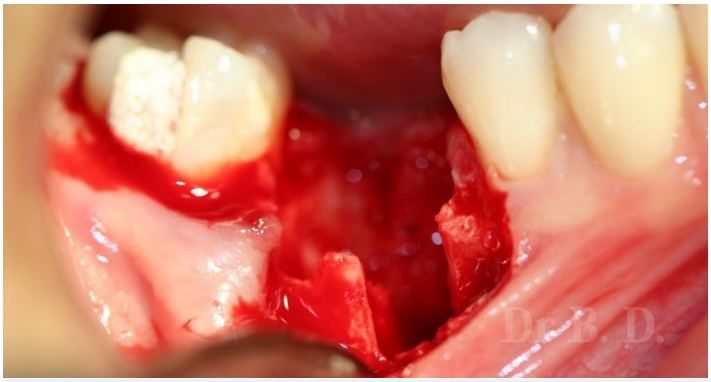
Radiographic image of #46 (30).

Fig. 2



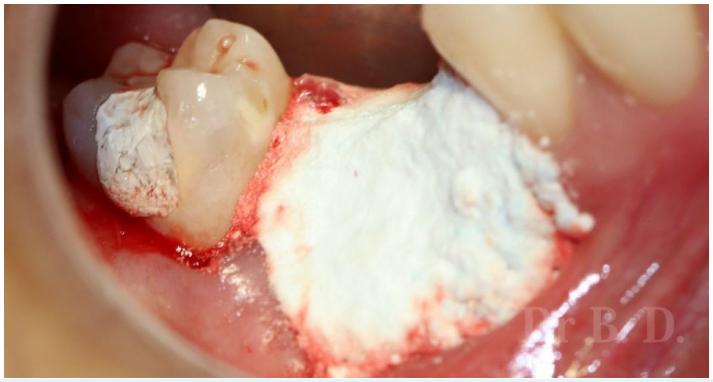
#46 (30) is to be extracted.

Fig. 3



According to the protocol, after minimal flap reflection a missing buccal plate can be noticed.

Fig. 4



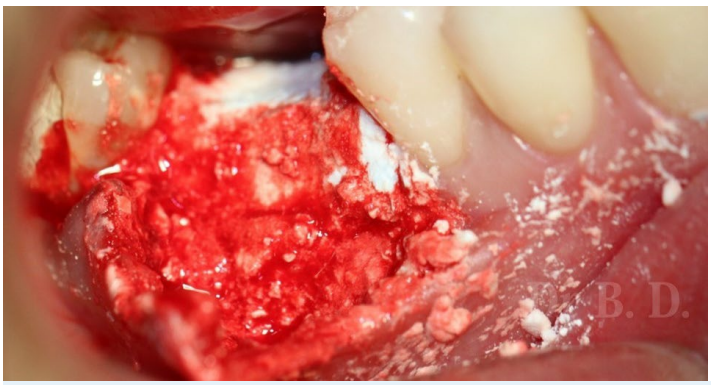
Bond Apatite® in placed, after pressing with the dry gauze.

CASE #1

CLINICAL EVIDENCE

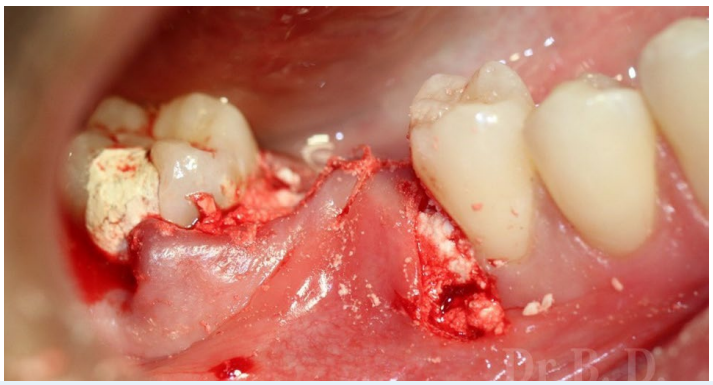
SOCKET GRAFTING WITHOUT 4 BONY WALLS

Fig. 5



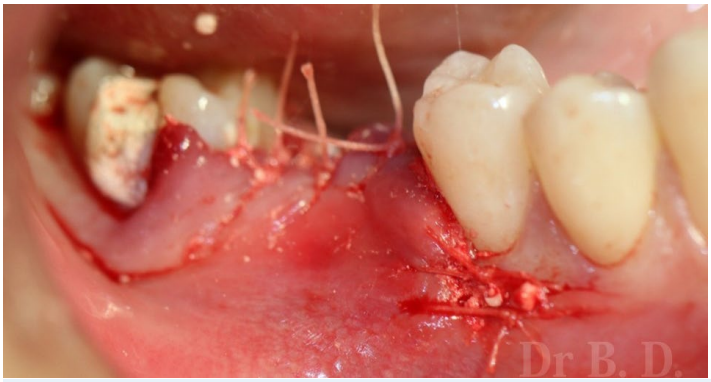
Bond Apatite® begins to absorb the surrounding blood. Reapply pressure with a sterile gauze.

Fig. 6



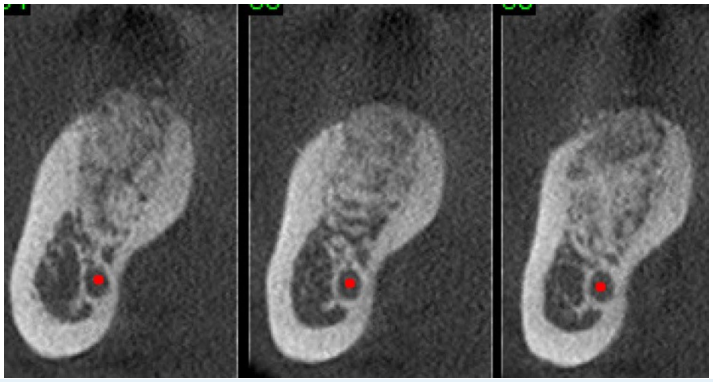
First suture the mesial corner of the flap, the flap is sutured with tension by stretching.

Fig. 7



Then sutures according to the sequence, mesial, distal, middle, in between, and finally the vertical incision is sutured.

Fig. 8



CBCT 3 months post-op.

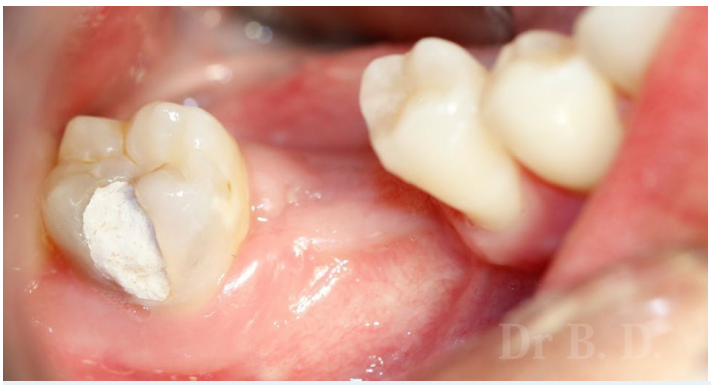
Complete bone formation.

CASE #1

CLINICAL EVIDENCE

SOCKET GRAFTING WITHOUT 4 BONY WALLS

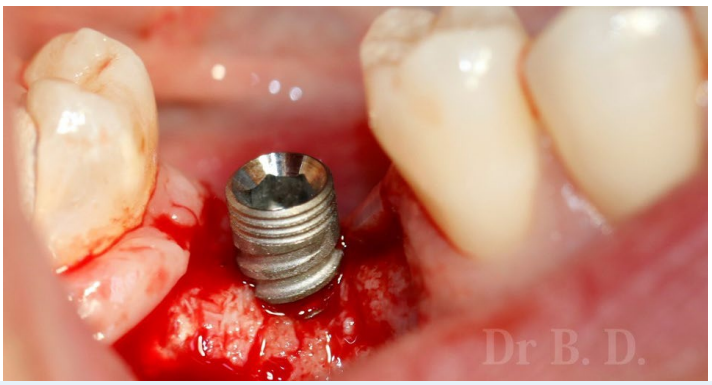
Fig. 9



3 months post-op.

Soft tissue healing appearance.

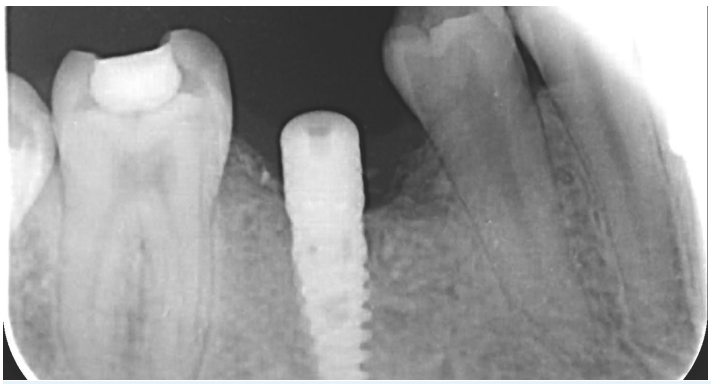
Fig. 10



3 months post-op.

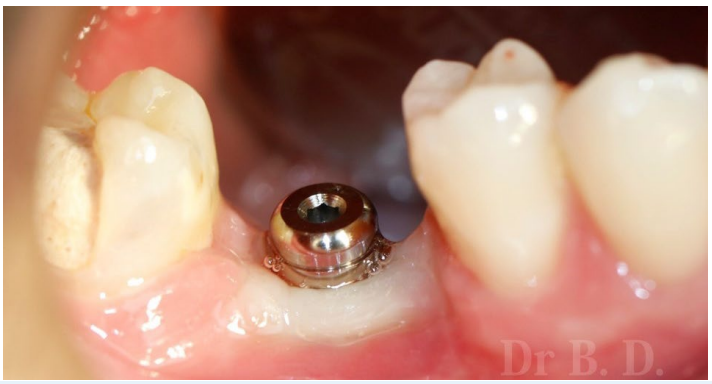
Placement of the implant in young, vascularized bone.

Fig. 11



Periapical X-ray, 6 months from the day of augmentation.

Fig. 12



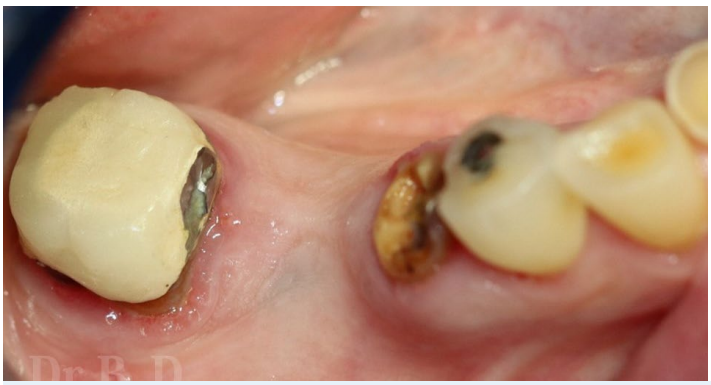
Keratinized gingiva around the implant.

CASE #2

CLINICAL EVIDENCE

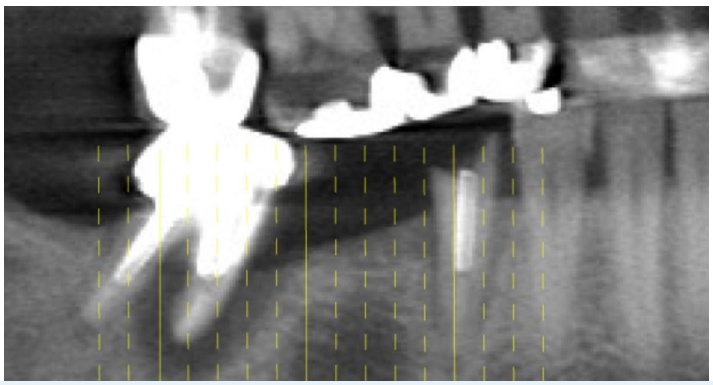
SOCKET GRAFTING WITHOUT 4 BONY WALLS

Fig. 1



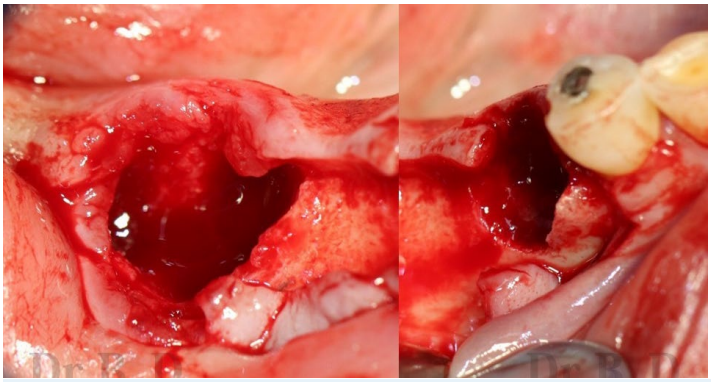
#45 (29) and #47 (31) are to be extracted.

Fig. 2



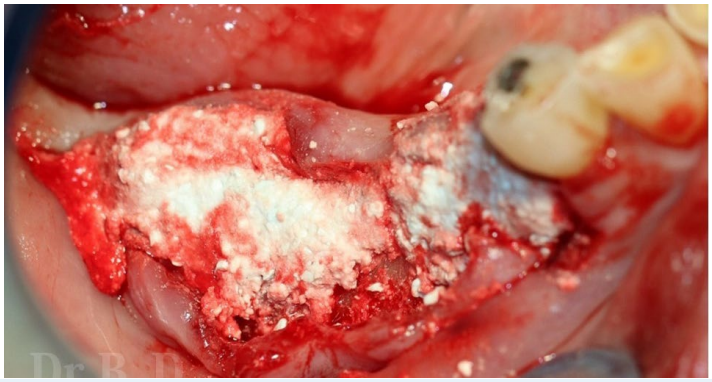
Panoramic X-ray showing the bone deficiency in #47 (31).

Fig. 3



The buccal plates of #45 (29) and #47 (31) are partially missing.

Fig. 4



Bond Apatite® in place after complete debridement in #47 (31).

CASE #2

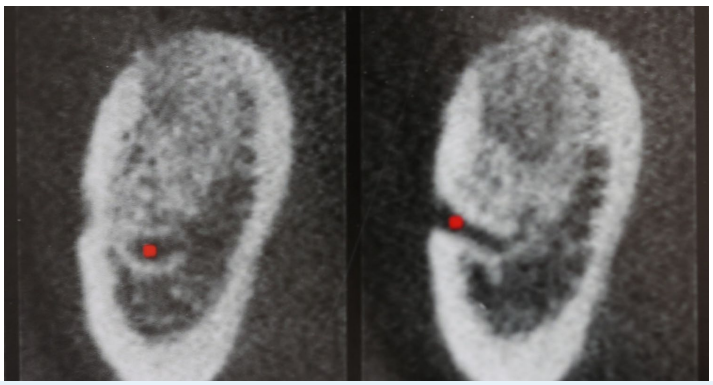
CLINICAL EVIDENCE

SOCKET GRAFTING WITHOUT 4 BONY WALLS

Fig. 5

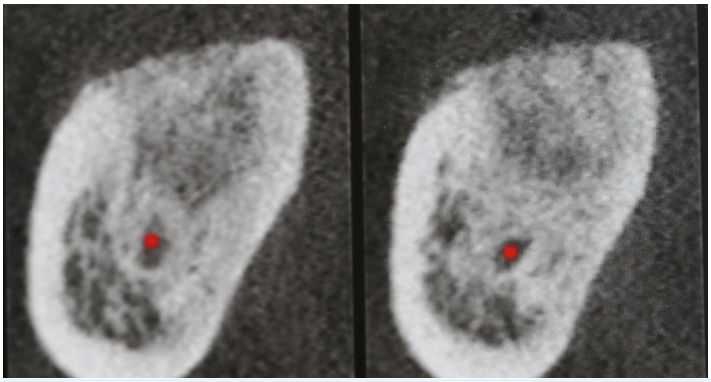
Flap stretched for closure with tension, according to the surgical protocol.

Fig. 6



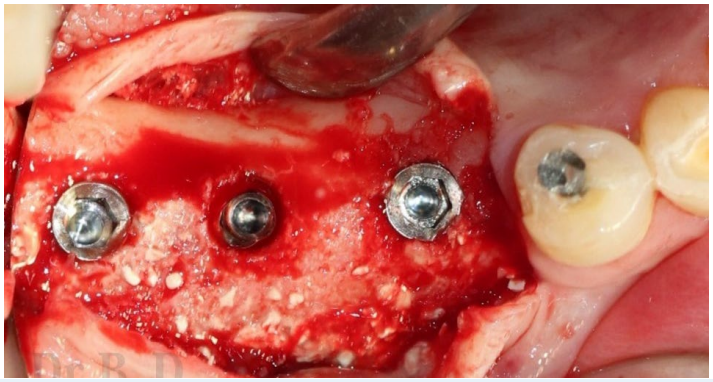
CBCT 4 months post-op - #45 (29), showing total bone regeneration.

Fig. 7



CBCT 4 months post-op - #47 (31).

Fig. 8



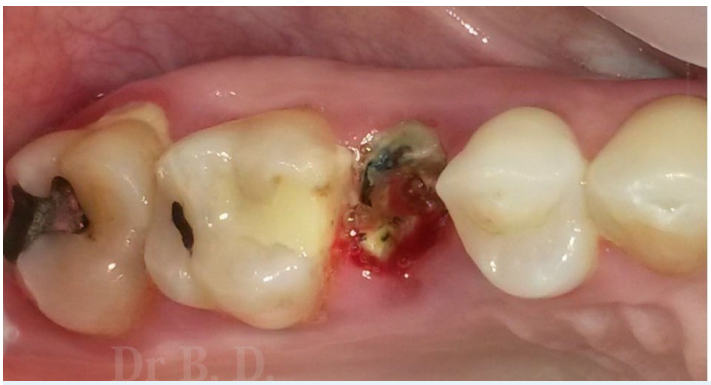
4 months post-op – Placement of 3 implants in a new regenerated bone.

CASE #3

CLINICAL EVIDENCE

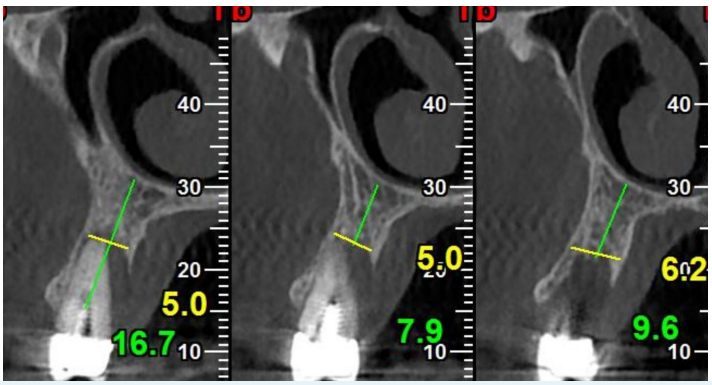
SOCKET GRAFTING WITHOUT 4 BONY WALLS

Fig. 1



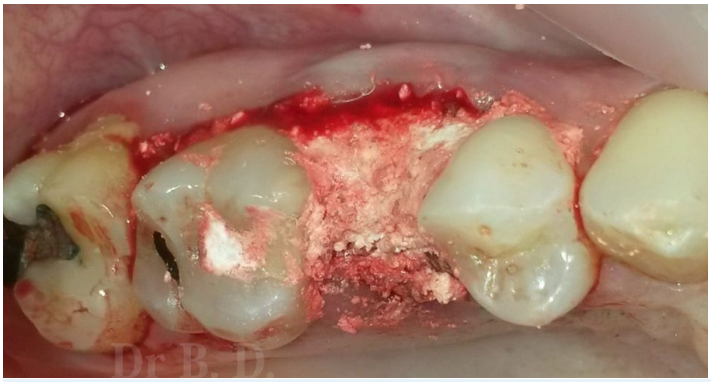
Tooth #25 (13) will be extracted.

Fig. 2



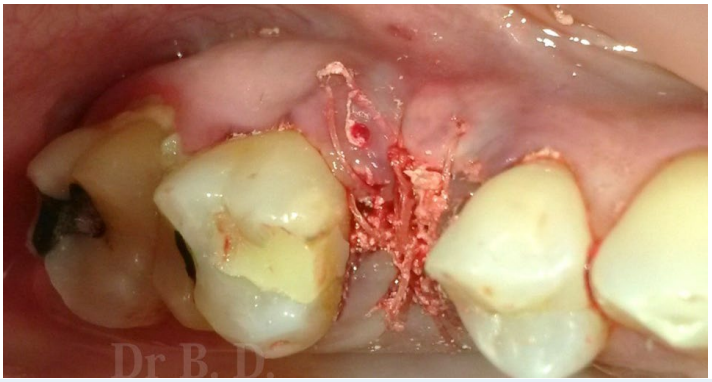
8mm bone deficiency can be seen in the palatine wall.

Fig. 3



Bond Apatite® in place.

Fig. 4



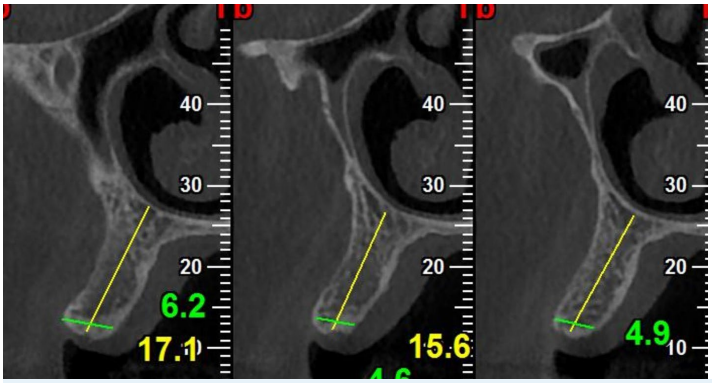
Soft tissue sutures with tension.

CASE #3

CLINICAL EVIDENCE

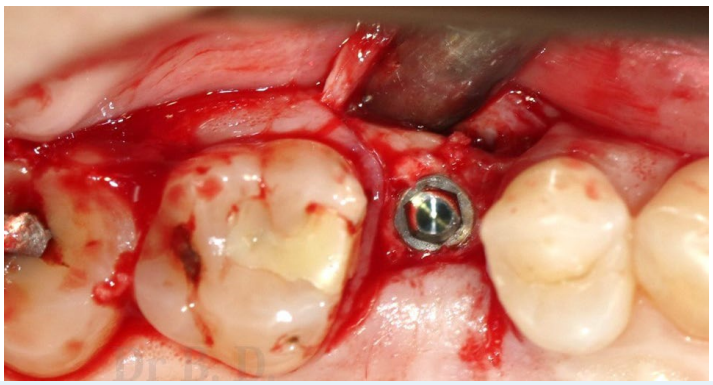
SOCKET GRAFTING WITHOUT 4 BONY WALLS

Fig. 5



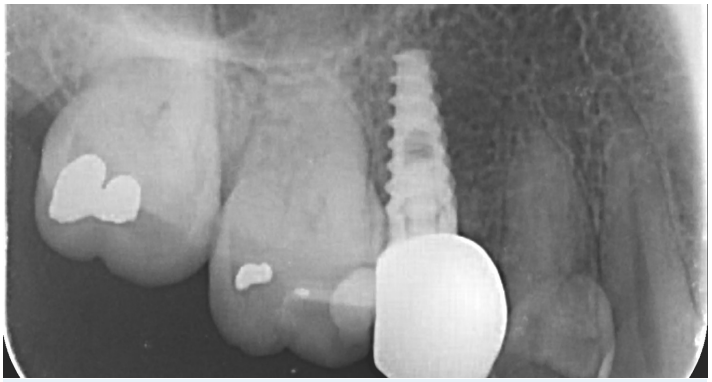
6 months post-op. Total bone regeneration with palatal cortex.

Fig. 6



6 months post-op. Placement of the implant.

Fig. 7



3 years post-op.

Periapical X-ray.

EXPERT TIPS

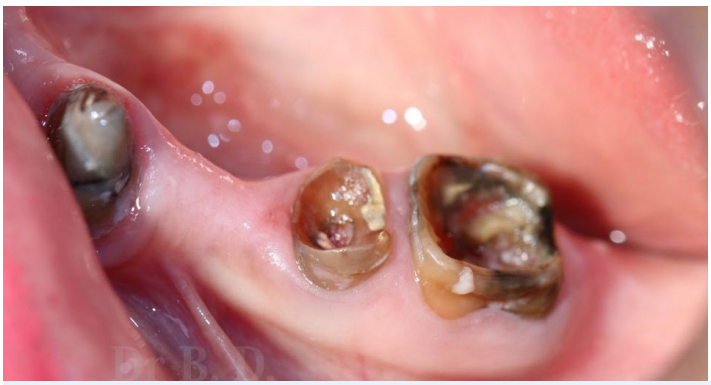
In this clinical case we traditionally would have had to make a palatal flap and use a membrane, but instead, the simple application of Bond Apatite® was highly effective to regenerate the bone, with the formation of a palatal cortex.

CASE #4

CLINICAL EVIDENCE

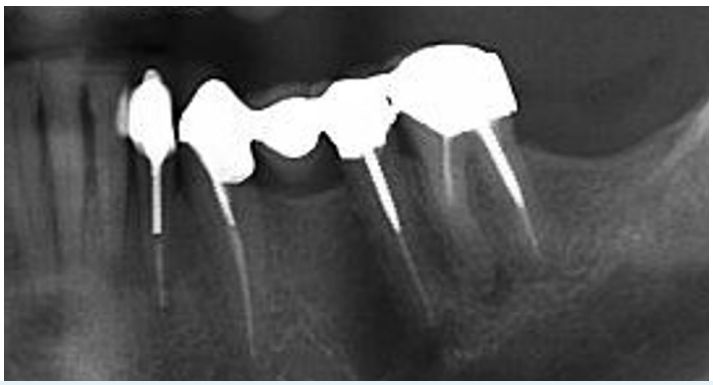
SOCKET GRAFTING WITHOUT 4 BONY WALLS

Fig. 1



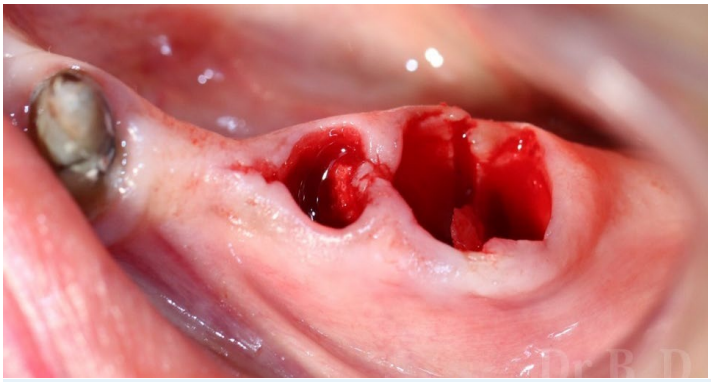
#35 (20) and 36 (19) are to be extracted.

Fig. 2



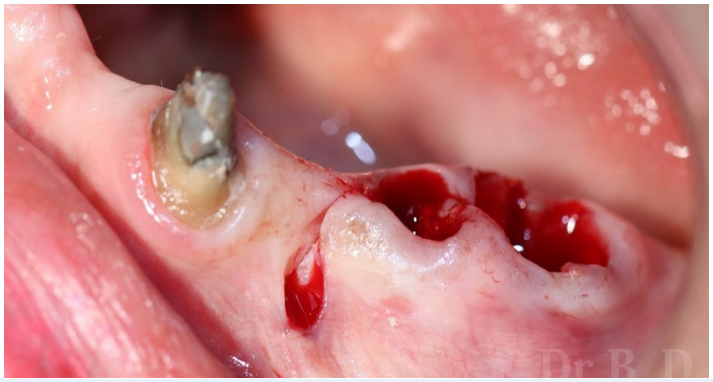
X-ray shows a bony lesion in both #35 (20) and #36 (19).

Fig. 3



After extracting we found that parts of the buccal bone walls are missing.

Fig. 4



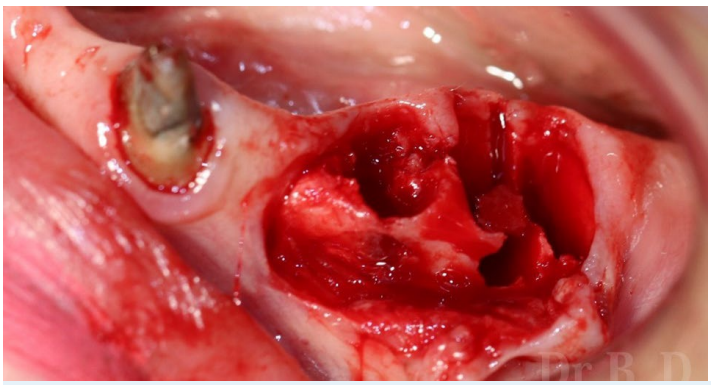
Oblique mesial vertical incision to expose the defect.

CASE #4

CLINICAL EVIDENCE

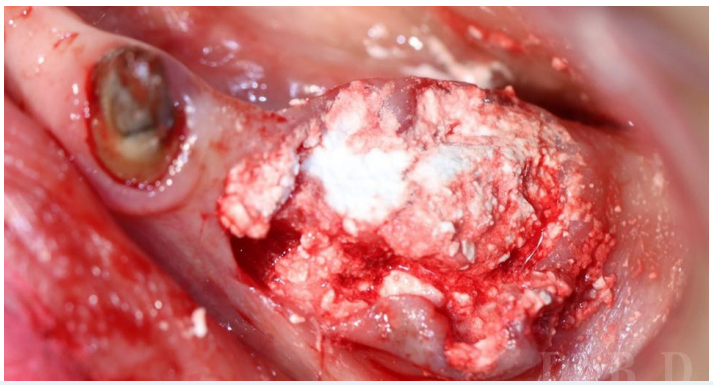
SOCKET GRAFTING WITHOUT 4 BONY WALLS

Fig. 5



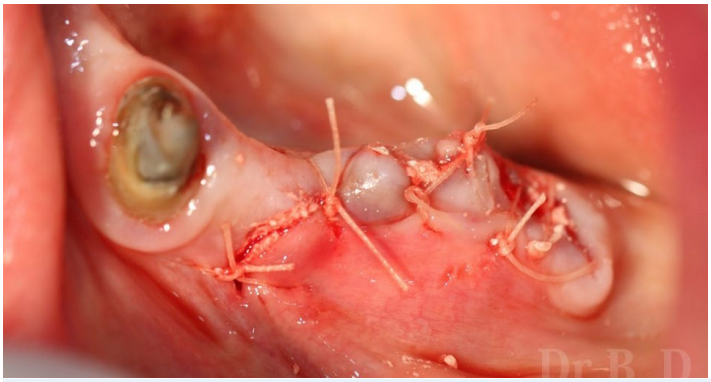
Reflection of a small flap of full thickness revealed the extent of the bone deficiency.

Fig. 6



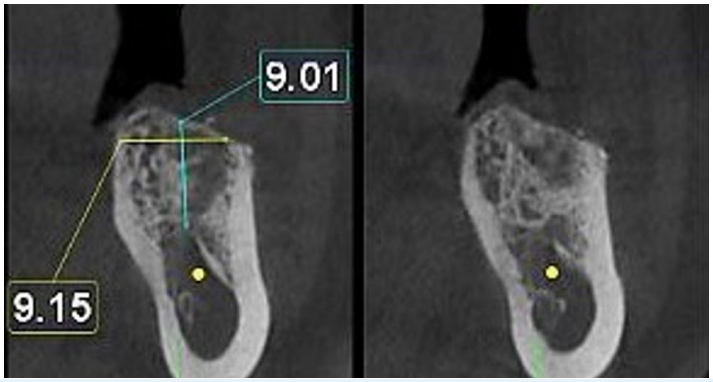
Bond Apatite® in place.

Fig. 7



Flap under tension is sutured with Rapid PGA.

Fig. 8



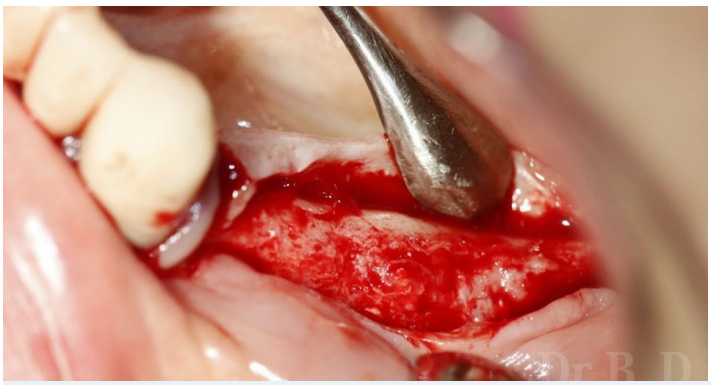
CBCT – 3 months post-op.

CASE #4

CLINICAL EVIDENCE

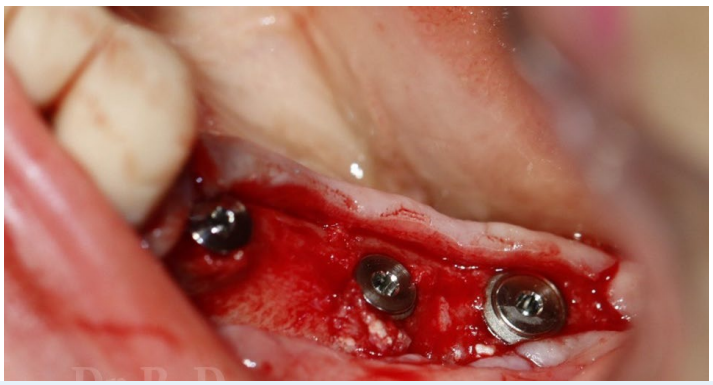
SOCKET GRAFTING WITHOUT 4 BONY WALLS

Fig. 9



Reentry 3 months post-op. Perfect regeneration of the bone defect can be seen.

Fig. 10



Placement of 3 implants.

EXPERT TIPS

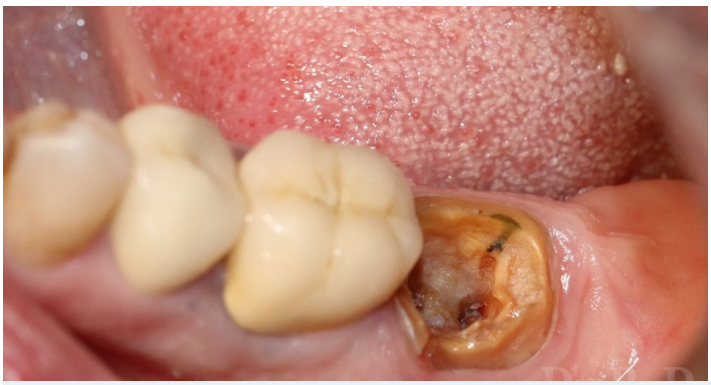
Since a tension free flap is not indicated, in cases where multiple teeth are being extracted a single vertical releasing incision is sufficient to allow the flap to cover the grafted sites by stretching.

CASE #5

CLINICAL EVIDENCE

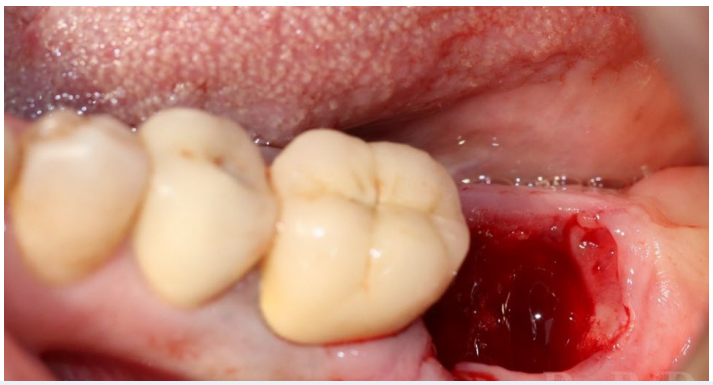
SOCKET GRAFTING WITHOUT 4 BONY WALLS

Fig. 1



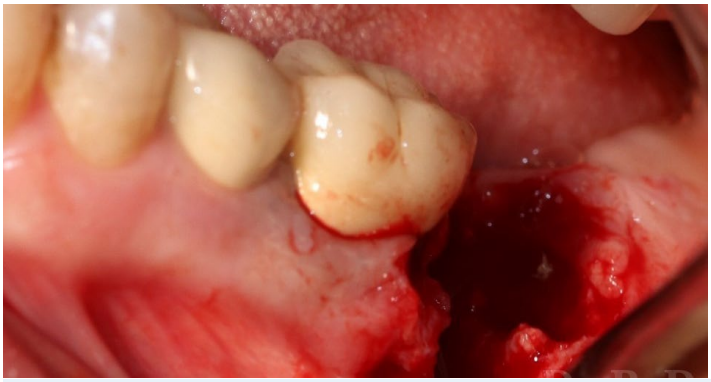
#37 (18) to be extracted.

Fig. 2



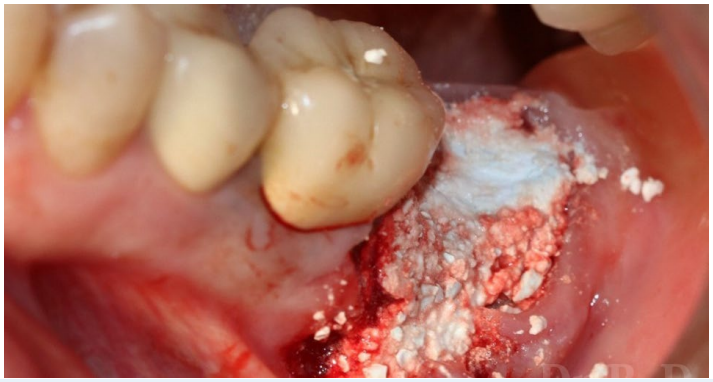
Probing after extraction to assess the extent of the bone defect.

Fig. 3



Small flap is reflected to reveal the extent of the buccal bone deficiency.

Fig. 4



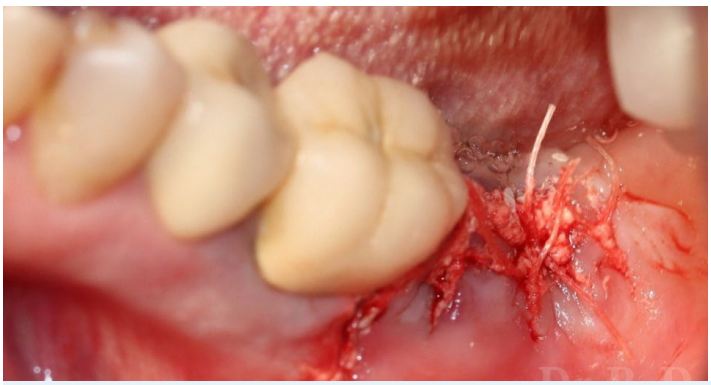
Bond Apatite® in place.

CASE #5

CLINICAL EVIDENCE

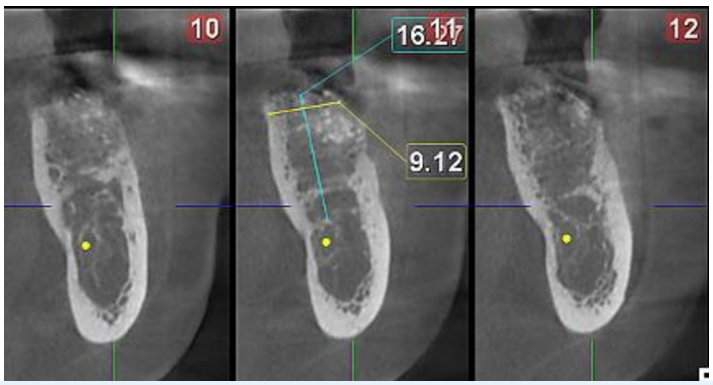
SOCKET GRAFTING WITHOUT 4 BONY WALLS

Fig. 5



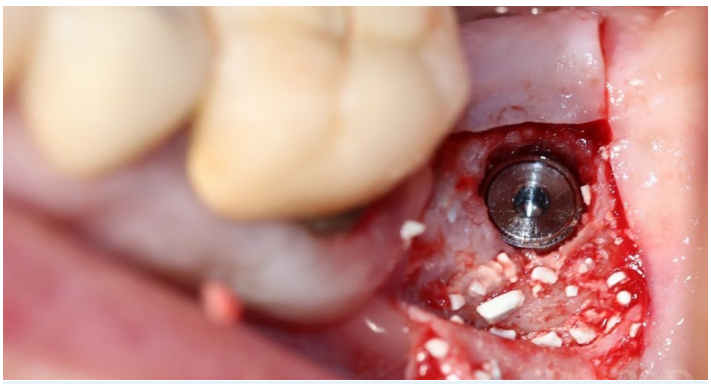
Sutures, flap closure with tension.

Fig. 6



CBCT showing the perfect regeneration of the buccal plate.

Fig. 7



3 months post-op. At this stage, some HA granules can be seen and are in the process of resorption.

Placement of the implant.

EXPERT TIPS

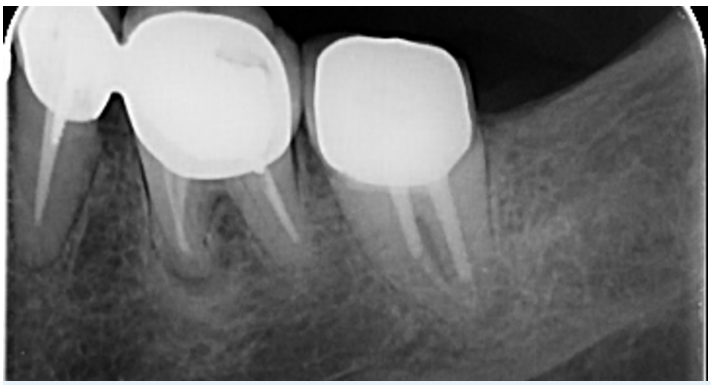
- The vertical releasing incision should be in a distance of at least 3-5mm from the bone defect and should allow visualization of the entire missing buccal plate.
- The use of Bond Apatite® allowed bone regeneration, with cortical formation, in a defect where the buccal plate was absent.
- Following the protocols ensures high predictability and clinical success.

CASE #6

CLINICAL EVIDENCE

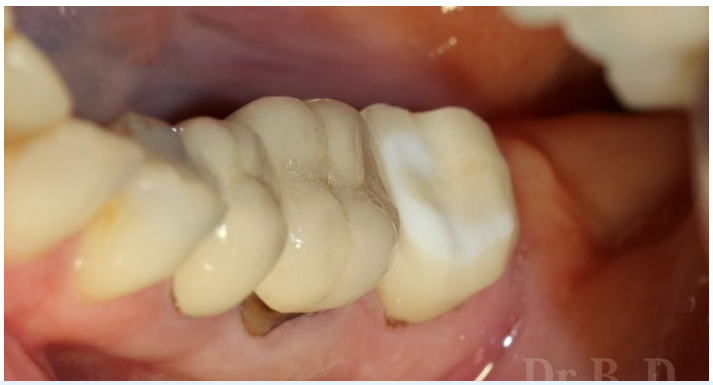
SOCKET GRAFTING WITHOUT 4 BONY WALLS

Fig. 1



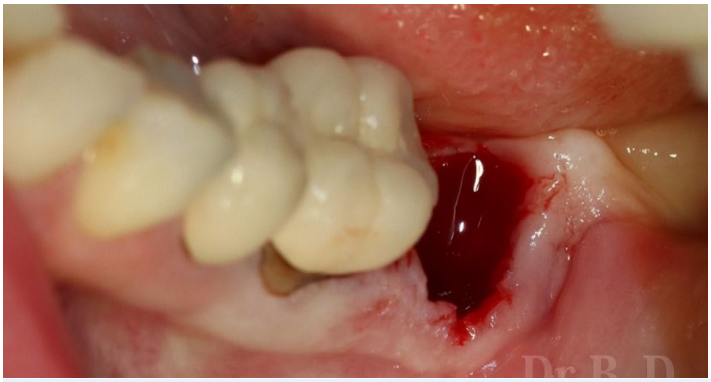
#37 (18) – needed to be extracted.

Fig. 2



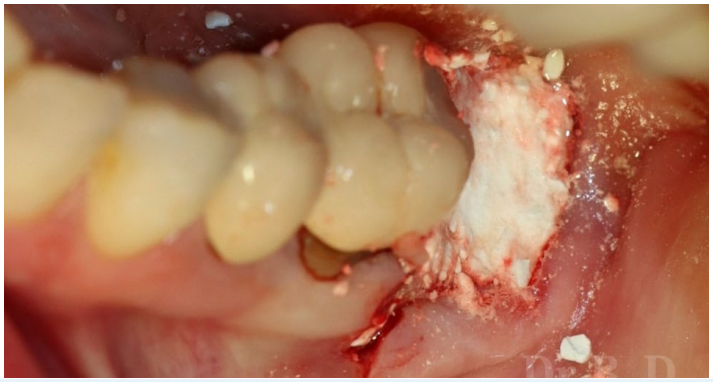
Large caries under the crown of #37 (18).

Fig. 3



After socket debridement, do not aspirate the blood clot before grafting.

Fig. 4



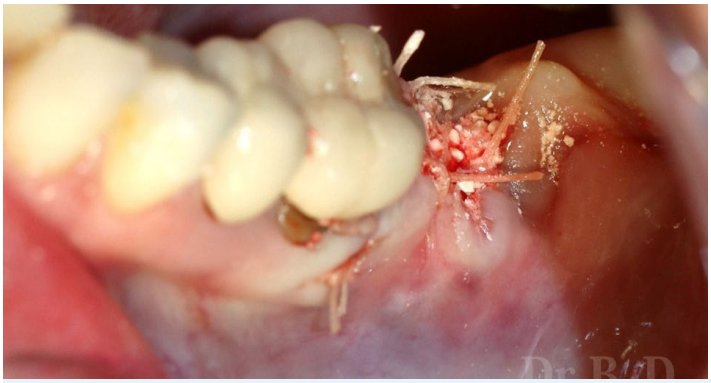
A minimal vertical incision and no membrane is required.

CASE #6

CLINICAL EVIDENCE

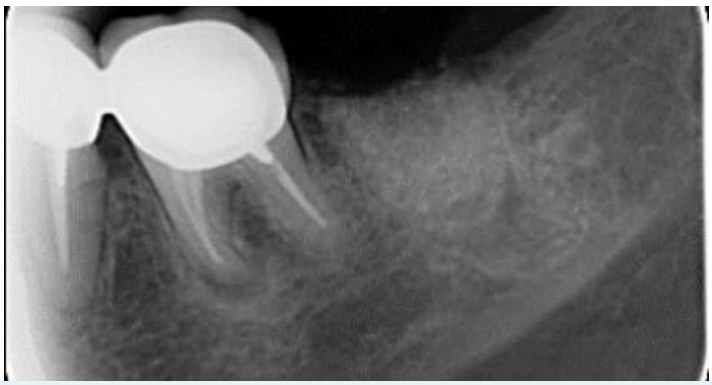
SOCKET GRAFTING WITHOUT 4 BONY WALLS

Fig. 5



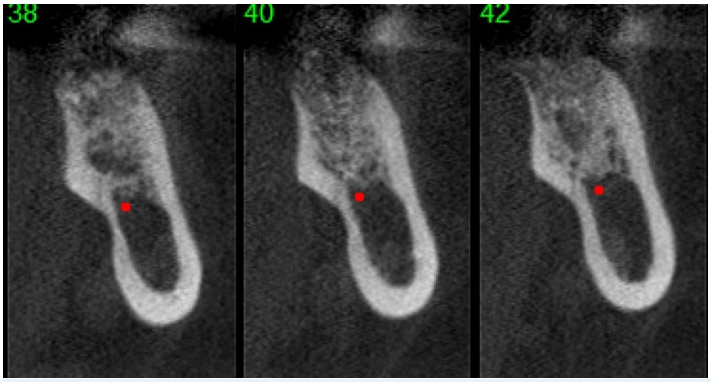
Maximal closure (3mm of graft exposure is acceptable).

Fig. 6



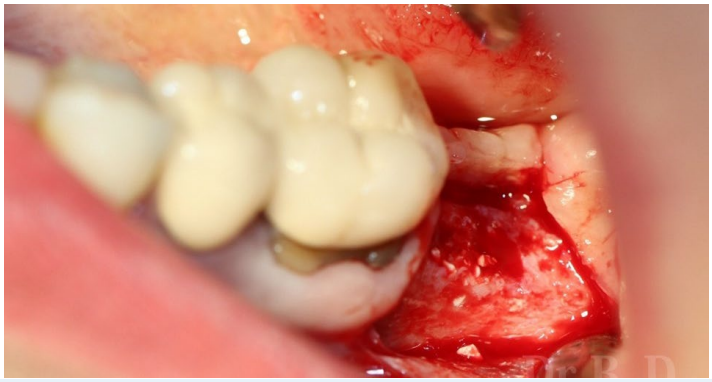
X-ray – Day of surgery.

Fig. 7



CBCT – 3 months post-op.

Fig. 8



Reentry – 3 months post-op.

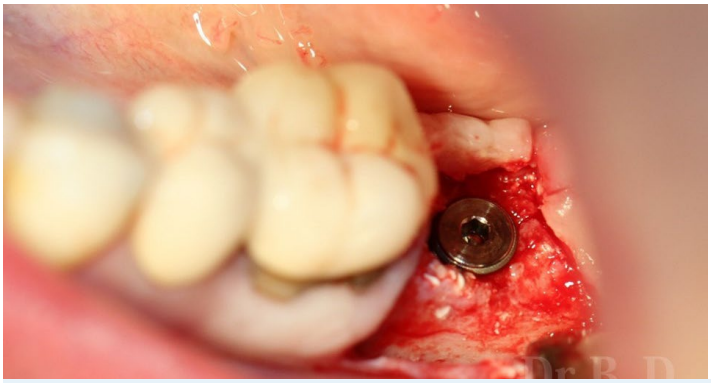
A true vital bone with small crystals of hydroxyapatite that are in the process of resorption.

CASE #6

CLINICAL EVIDENCE

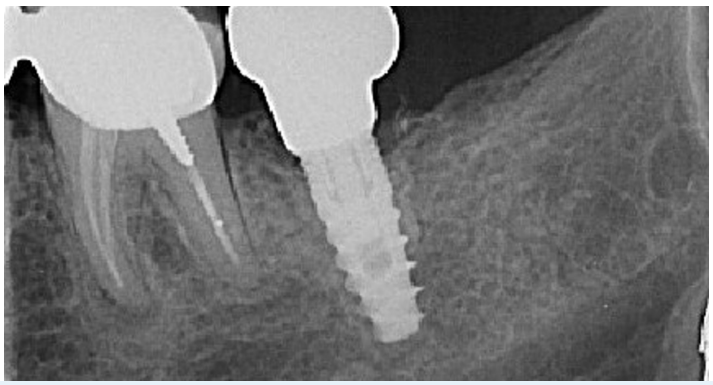
SOCKET GRAFTING WITHOUT 4 BONY WALLS

Fig. 9



Placement of the implant 3 months post-op.

Fig. 10



18 months post-op.

Very stable and satisfactory results.

EXPERT TIPS

- The possibility of suturing the flap under tension enables us to respect the stability of the material and to limit inflammatory reactions.
- When a buccal wall is missing, a small incision and a full thickness flap sutured with tension will give very good results when using Bond Apatite®.

LEARN MORE

SOCKET GRAFTING WITHOUT 4 BONY WALLS

INTRUCTIONAL VIDEO

ANIMATED PROTOCOL

ON-DEMAND WEBINAR

SURGICAL PROTOCOL

Lateral Ridge Augmentation

STEPS

Watch the video

1. Minimally reflect the flap, enough to expose the entire grafted site.
2. (After placing the cement) Press with a dry gauze, first with a finger and then with a periosteal elevator.
3. Reposition the flap by stretching it directly above the cement for maximal closure.
4. Suture.

EXPERT TIPS

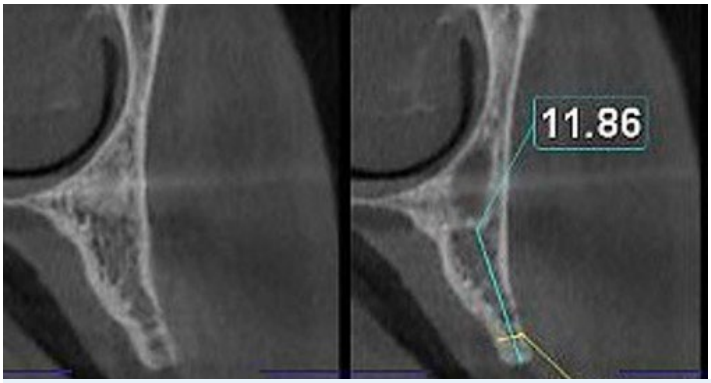
- Perform a short vertical incision at a distance from the grafted site. That vertical incision should not pass the mucogingival junction by more than 2-3 mm. As well during undermining with the periosteal elevator in order to reflect the flap, it should not go deeper than 2-3 mm into the mobile mucosa.
- It is recommended to do decortication before placement of the cement.
- Suture first the mesial corner, then distal, then in the middle. After these first steps, sutures can be placed in between and finally for the vertical releasing incision.

CASE #1

CLINICAL EVIDENCE

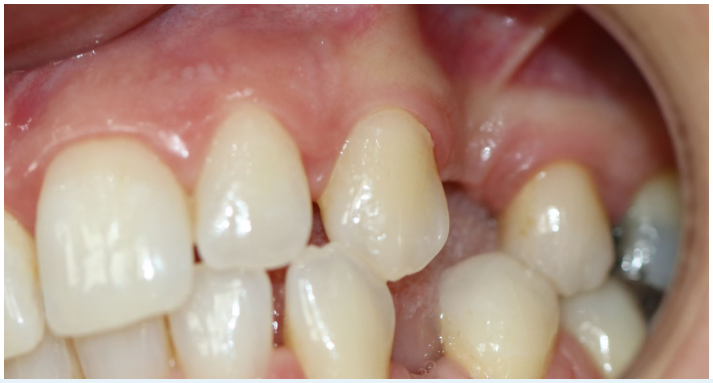
LATERAL RIDGE AUGMENTATION

Fig. 1



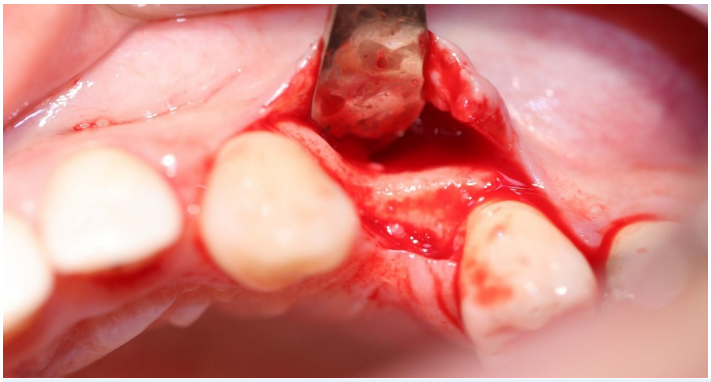
Thin ridge, #24 (12) - 2mm thick.

Fig. 2



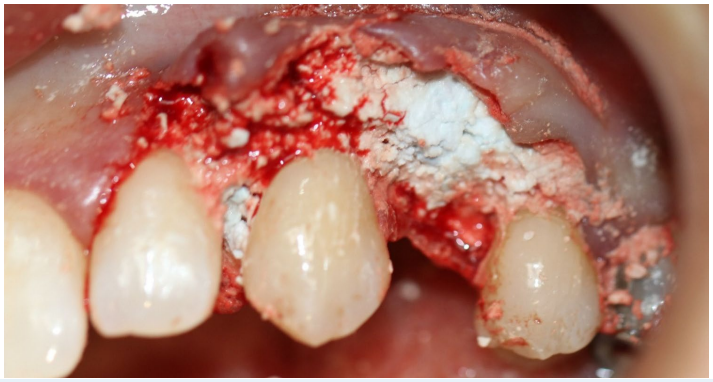
#24 (12) was extracted few years earlier without preserving the socket. Therefore, the bone is very narrow.

Fig. 3



During a full thickness flap reflection, It is necessary to visualize the entire area.

Fig. 4



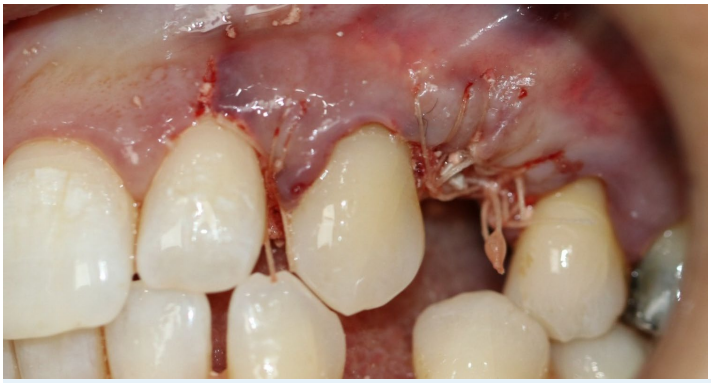
Placement of Bond Apatite®, augmenting the area of #22 (10).

CASE #1

CLINICAL EVIDENCE

LATERAL RIDGE AUGMENTATION

Fig. 5

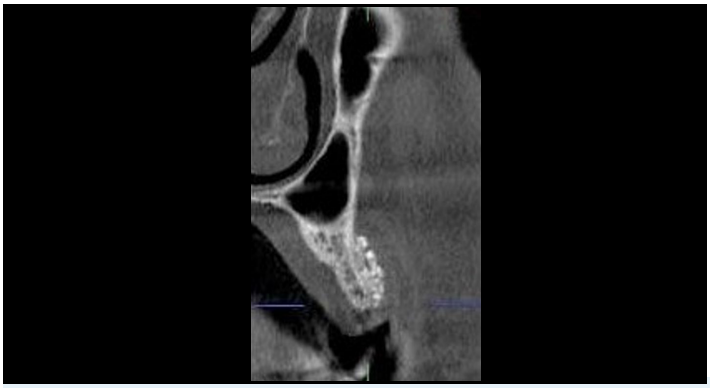


Closure of the flap with tension.

Fig. 6

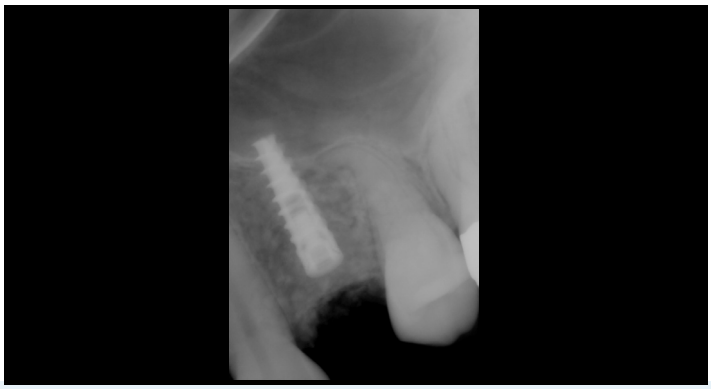
1 day post-op - No sign of inflammation.

Fig. 7



CBCT 3 months post-op.

Fig. 8



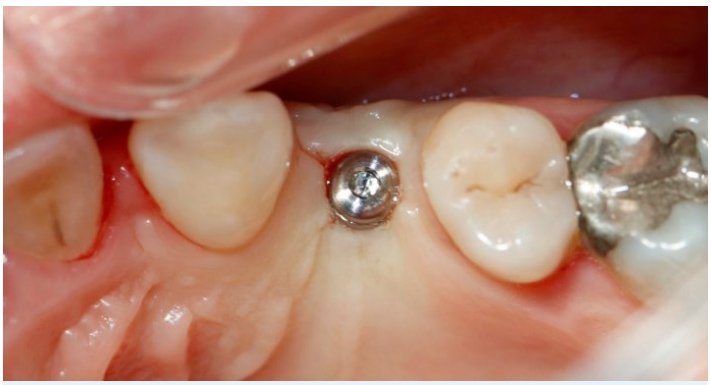
X-ray 3 months post implant placement.

CASE #1

CLINICAL EVIDENCE

LATERAL RIDGE AUGMENTATION

Fig. 9



Notice the thickness of the soft tissue.

EXPERT TIPS

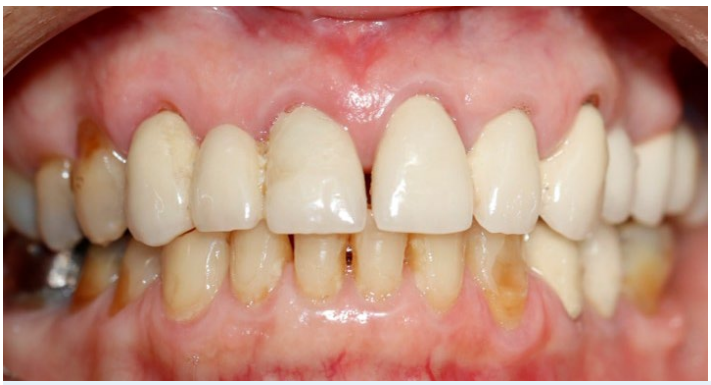
To further improve the result, it is preferable to do decortication before grafting.

CASE #2

CLINICAL EVIDENCE

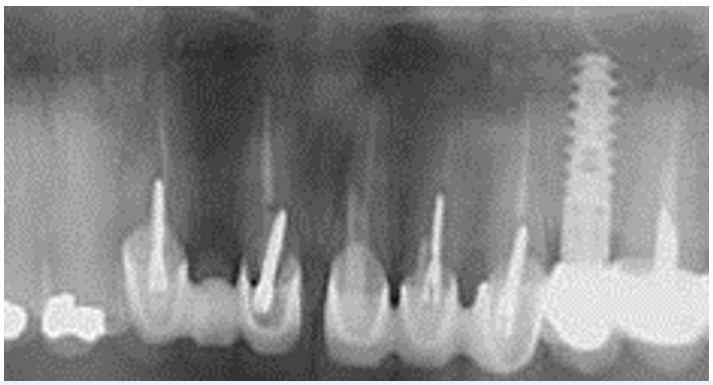
LATERAL RIDGE AUGMENTATION

Fig. 1



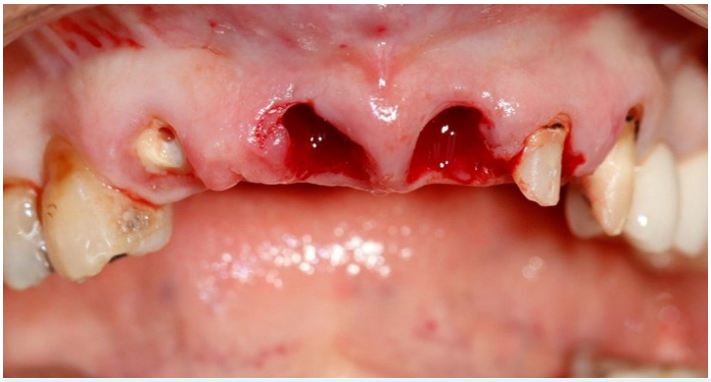
Old and unstable bridge from #13 (6) to #23 (11) needed to be replaced.

Fig. 2



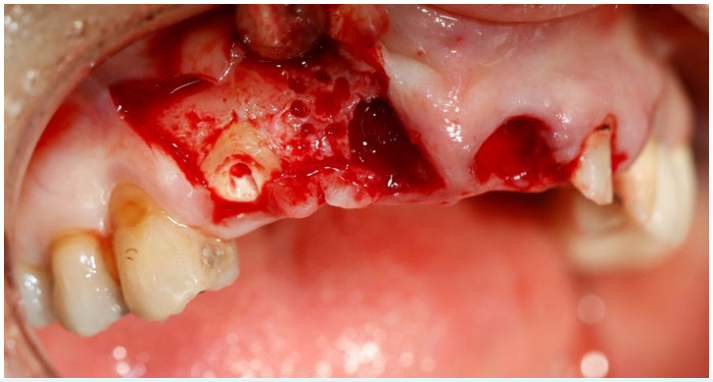
It was decided to keep #13 (6), #22 (10) and #23 (11).

Fig. 3



The treatment plan was to place implants in #12 (7) and #21 (9).

Fig. 4



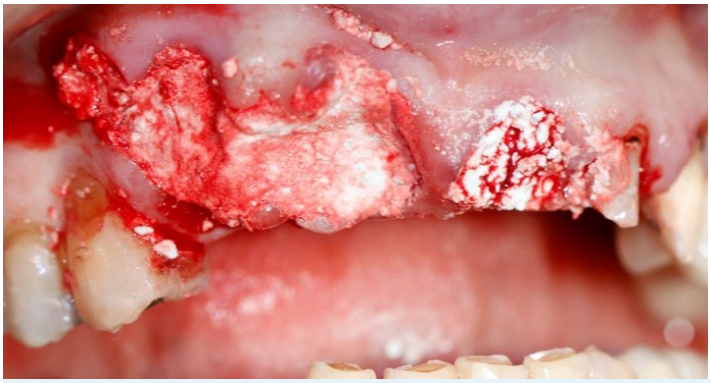
After flap reflection, a narrow ridge can be seen near #12 (7). Decortication was performed before augmentation.

CASE #2

CLINICAL EVIDENCE

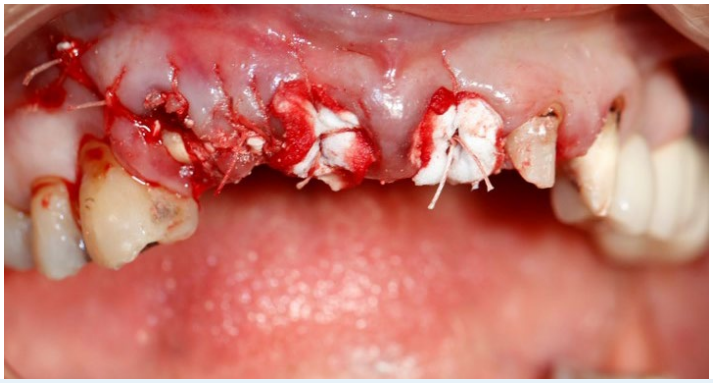
LATERAL RIDGE AUGMENTATION

Fig. 5



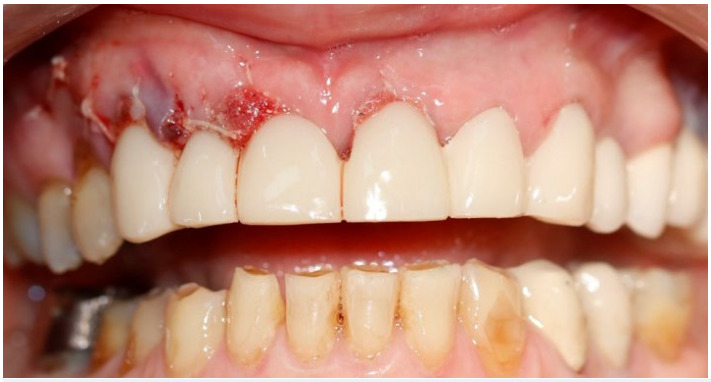
Bond Apatite® in place.

Fig. 6



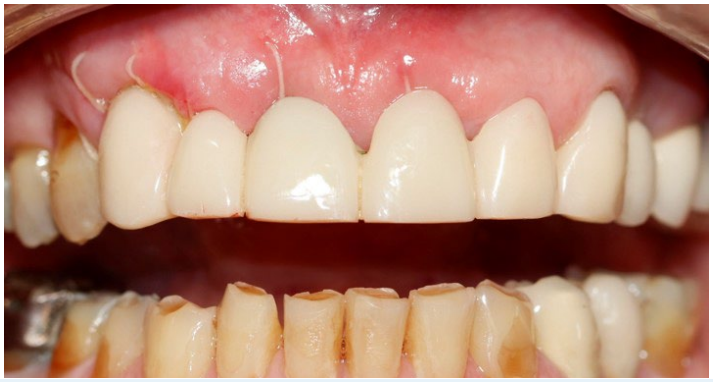
Sutures and collagen sponge covering the Bond Apatite® in #11 (8) and #21 (9).

Fig. 7



Temporary bridge placed on the day of the operation.

Fig. 8



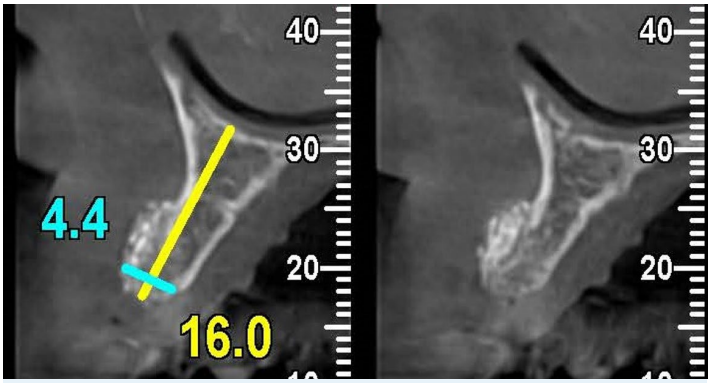
2 weeks post-op - Soft tissue appearance.

CASE #2

CLINICAL EVIDENCE

LATERAL RIDGE AUGMENTATION

Fig. 9



CBCT - 4 months post-op.

EXPERT TIPS

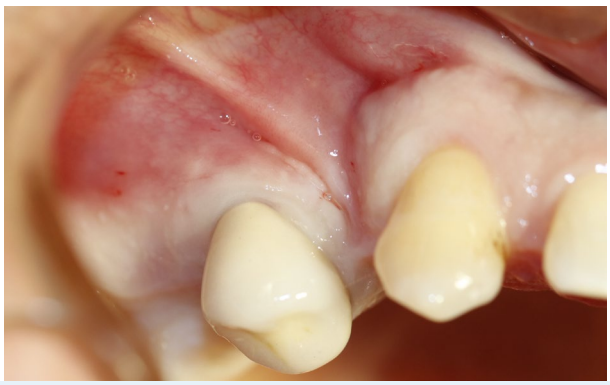
Fixed prosthetics is essential to prevent graft movement.

CASE #3

CLINICAL EVIDENCE

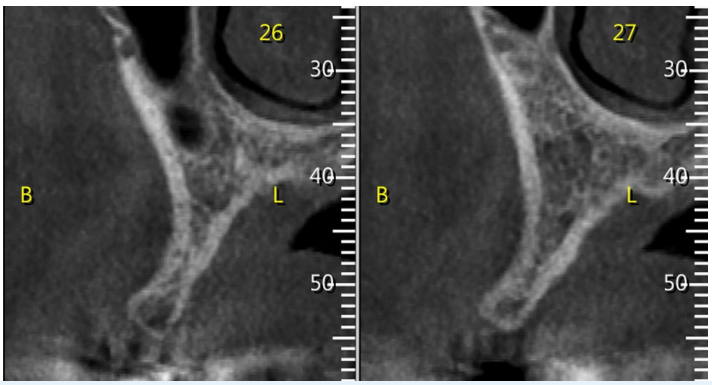
LATERAL RIDGE AUGMENTATION

Fig. 1



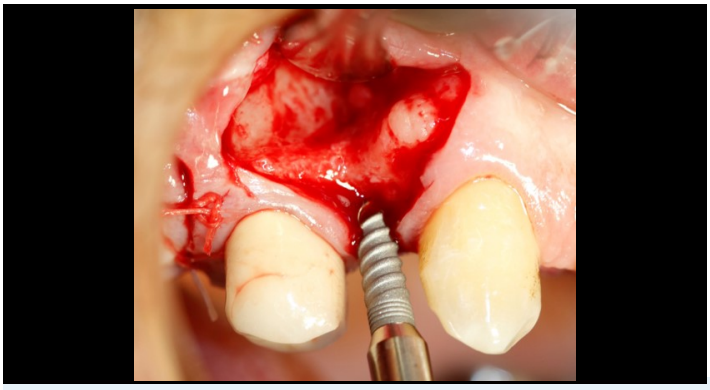
Buccal collapse in #14 (5) which was extracted without socket grafting.

Fig. 2



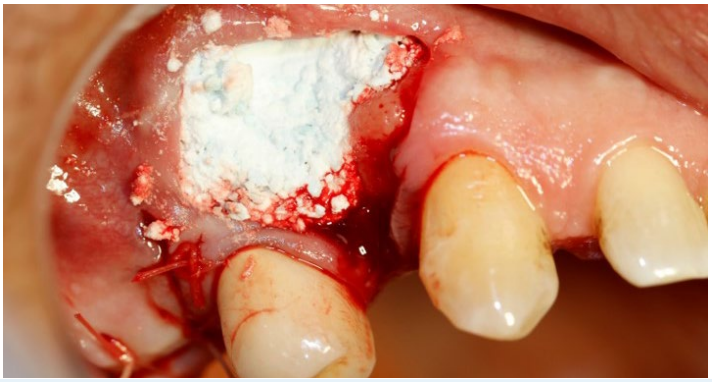
CBCT confirming a narrow ridge.

Fig. 3



Placement of a 3/16 implant and visualization of the area to be grafted.

Fig. 4



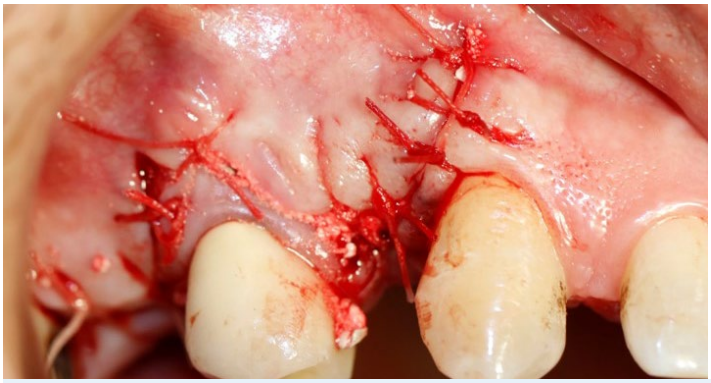
Bond Apatite® in place, forming a compact block.

CASE #3

CLINICAL EVIDENCE

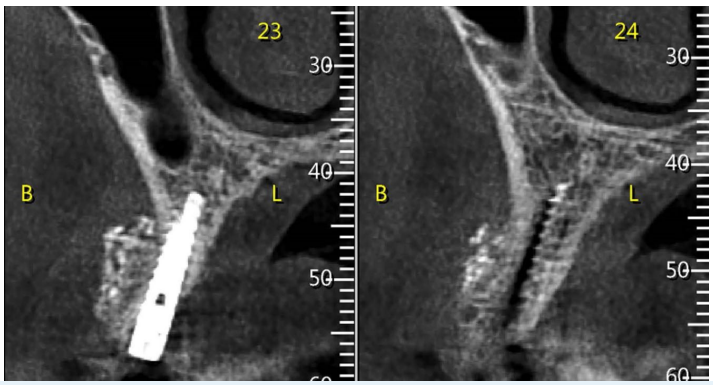
LATERAL RIDGE AUGMENTATION

Fig. 5



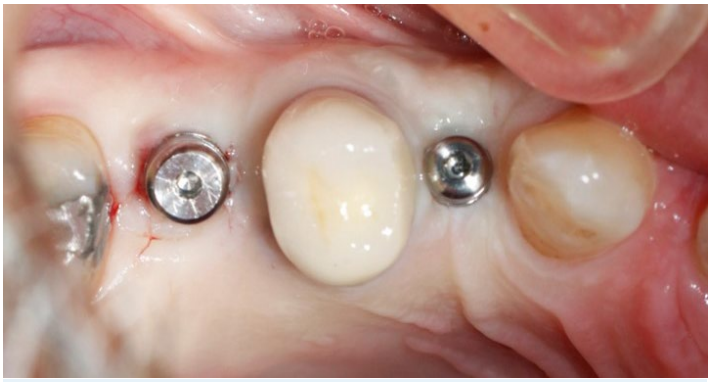
Sutures.

Fig. 6



4 months post-op – sufficient bone width is achieved.

Fig. 7



4 months post-op.

EXPERT TIPS

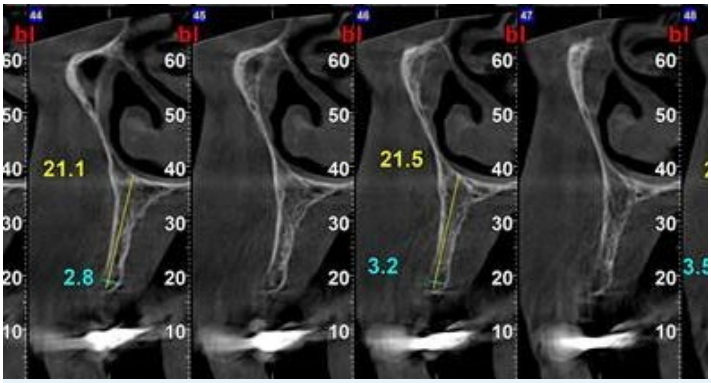
In cases of simultaneous implant placement with augmentation procedure, it is necessary to ensure the primary stability of the implant.

CASE #4

CLINICAL EVIDENCE

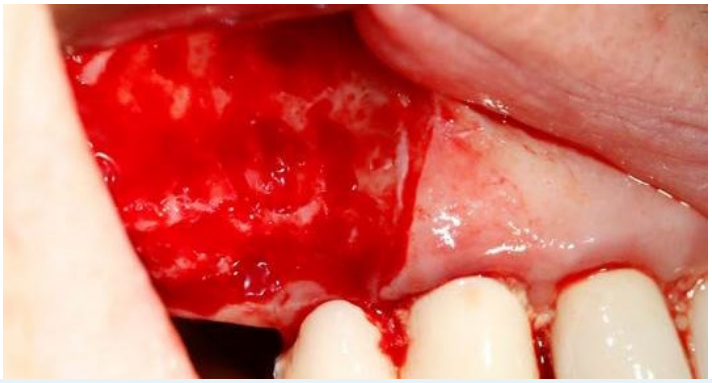
LATERAL RIDGE AUGMENTATION

Fig. 1



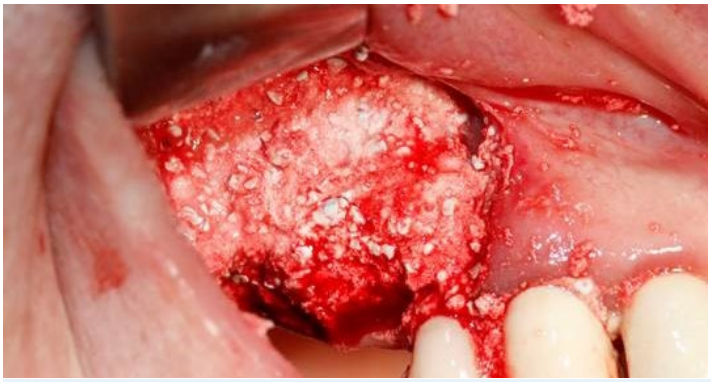
CBCT - Pre-op of #14 (5) and #15 (4).

Fig. 2



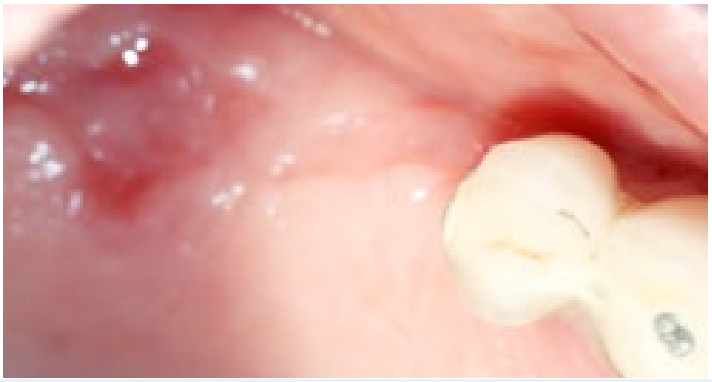
Decortication of the buccal wall.

Fig. 3



Bond Apatite® in place.

Fig. 4



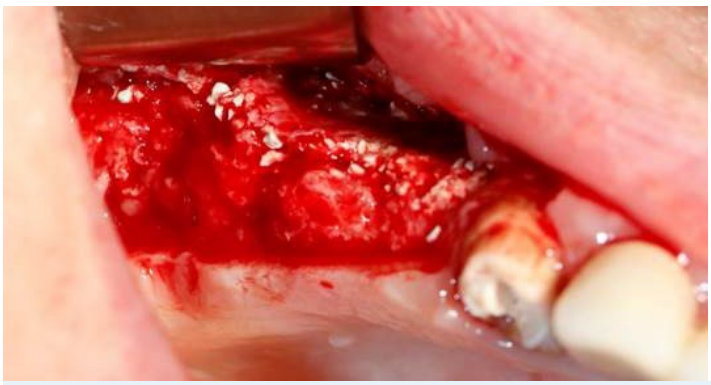
4 weeks post-op – soft tissue healing appearance.

CASE #4

CLINICAL EVIDENCE

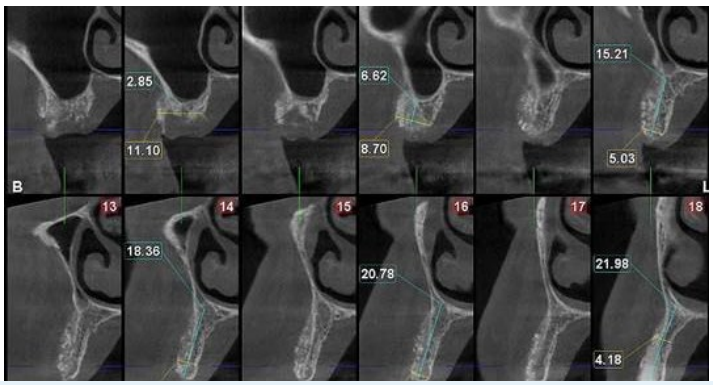
LATERAL RIDGE AUGMENTATION

Fig. 5



Reentry 4 months post-op.

Fig. 6



CBCT 4 months post-op.

EXPERT TIPS

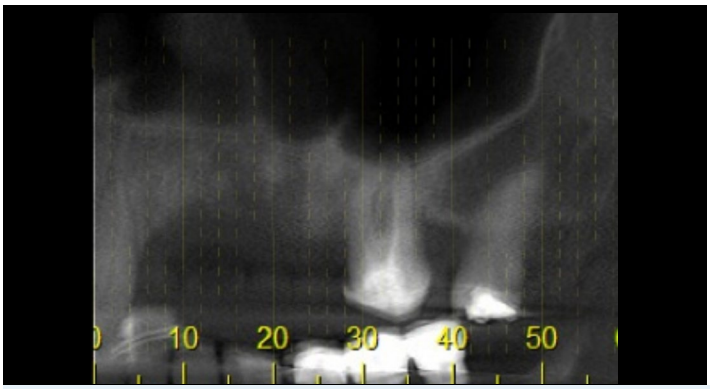
- Graft stability during the healing phase is crucial.
- Do not use removable temporary prostheses.
- Instruct the patient to apply a soft diet for avoiding pressure in the area.

CASE #5

CLINICAL EVIDENCE

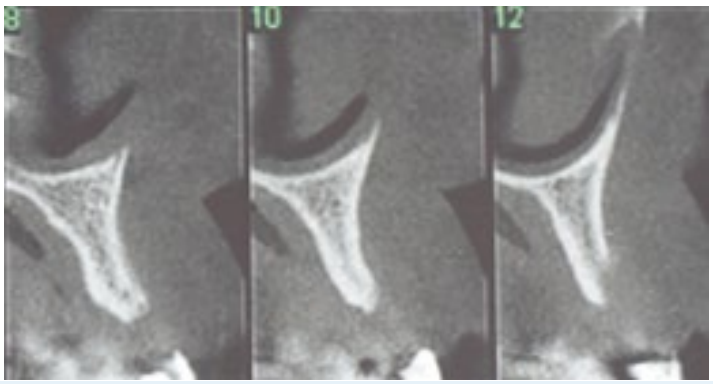
LATERAL RIDGE AUGMENTATION

Fig. 1



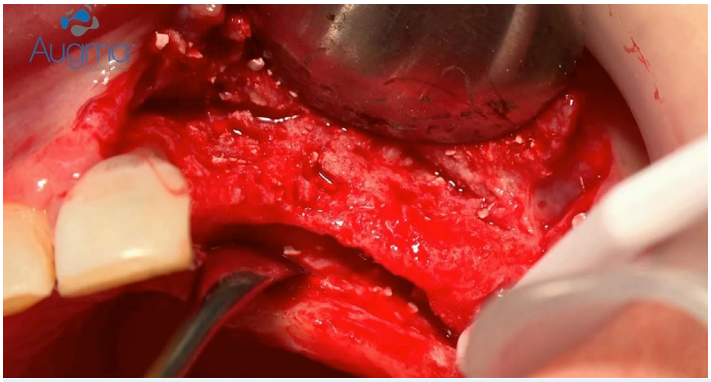
CBCT pre-op – #22 - #25 (33-41)

Fig. 2



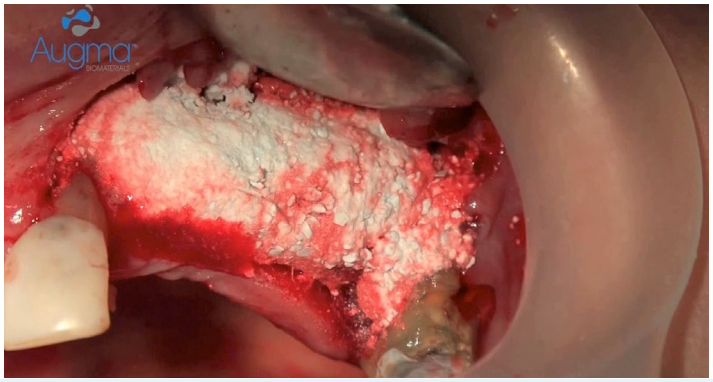
CBCT - #22 - #25 (33-41) represents a narrow crest.

Fig. 3



Clinical appearance after flap reflection.

Fig. 4



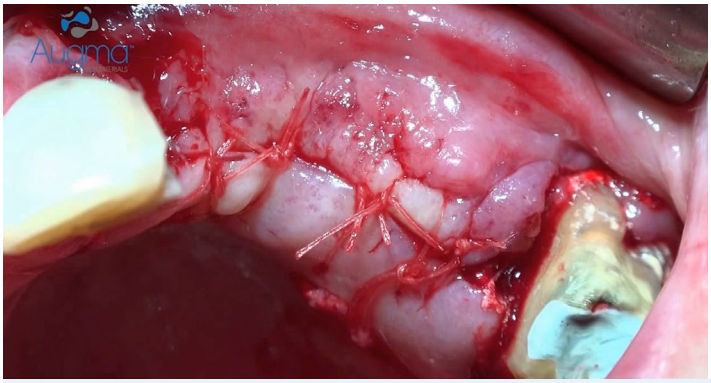
Bond Apatite® in place.

CASE #5

CLINICAL EVIDENCE

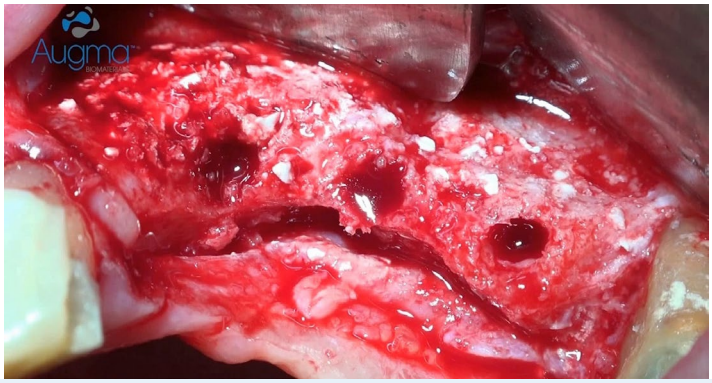
LATERAL RIDGE AUGMENTATION

Fig. 5



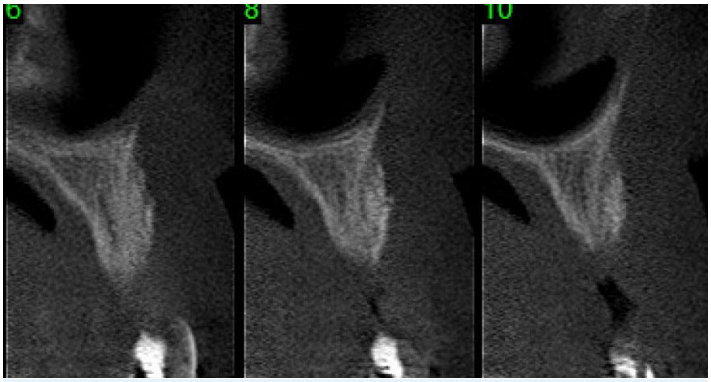
Sutures

Fig. 6



Reopening - 4 months-post-op and osteotomy.

Fig. 7



CBCT – 4 months post-op.

EXPERT TIPS

- According to the protocol, graft stabilization is achieved by minimal flap reflection.
- Perform the ***predictability test*** by placing your finger in the vestibule and vibrating it to ascertain that the sutures don't move at all.
- Following the protocol prevents flap movement due to the traction of the muscles.

LEARN MORE

LATERAL RIDGE AUGMENTATION

INTRUCTIONAL VIDEO

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Augma™ BIOMATERIALS

SURGICAL PROTOCOL

Closed Sinus Lift/Intra-Crestal Approach

STEPS

Watch the video

1. Prepare your osteotomy and slightly elevate the sinus membrane.
2. Activate the syringe.
3. Place the cement in a sterile dish and wait for 3 minutes.
4. Reload the syringe.
5. Deliver the cement into the osteotomy and lift the sinus membrane.
6. Place the implant if planned, and suture.

EXPERT TIPS

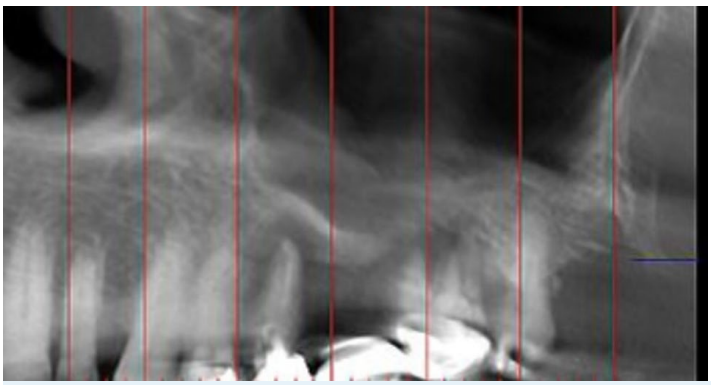
- Place the cement in a sterile dish. After 1 minute break the cement into small particles and wait an additional 2 minutes (in total 3 minutes).
- Reload the particles into a Bond Apatite® syringe, or any other bone carrier syringe.
- Introduce the cement, then push with an osteotome.

CASE #1

CLINICAL EVIDENCE

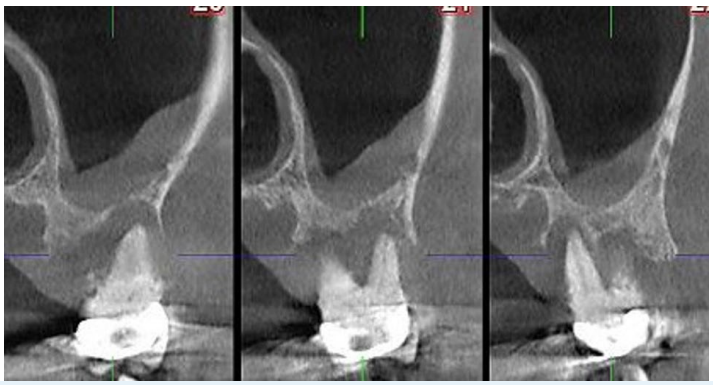
CLOSED SINUS LIFT

Fig. 1



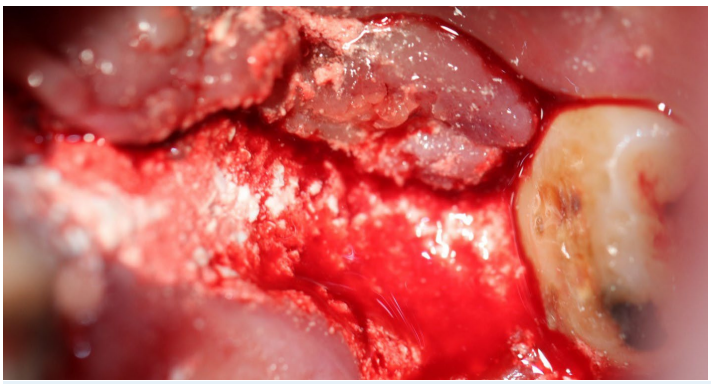
#25 (13) and #27 (15) will be extracted due to a significant infection resulting in increased bone resorption.

Fig. 2



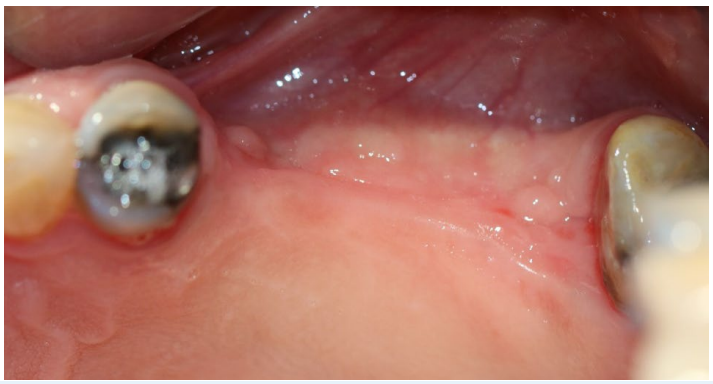
Identical situation in #27 (15). The goal is to obtain 3mm-4mm of bone.

Fig. 3



Placement of Bond Apatite® after extraction of #25 (13), #27 (15).

Fig. 4



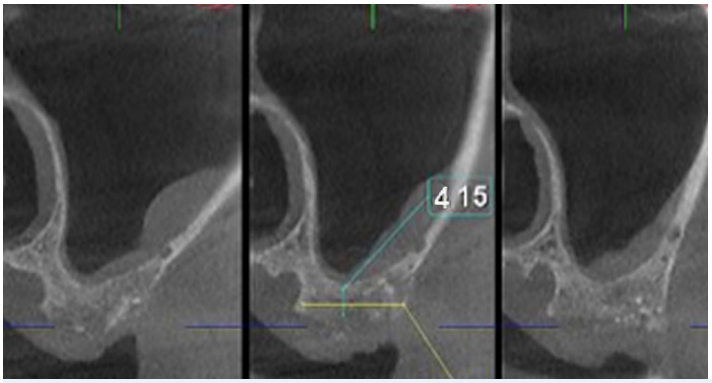
3 months post-op – soft tissue appearance.

CASE #1

CLINICAL EVIDENCE

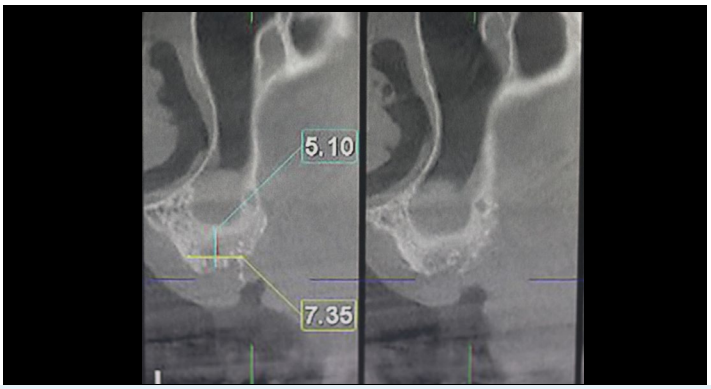
CLOSED SINUS LIFT

Fig. 5



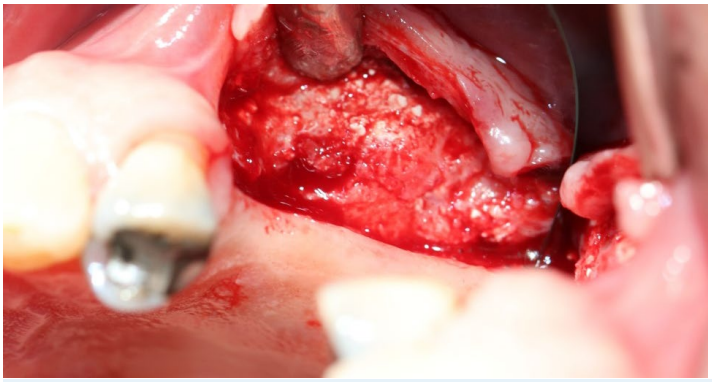
CBCT 3 months post-op of #27 (15), we obtained our 4mm of bone.

Fig. 6



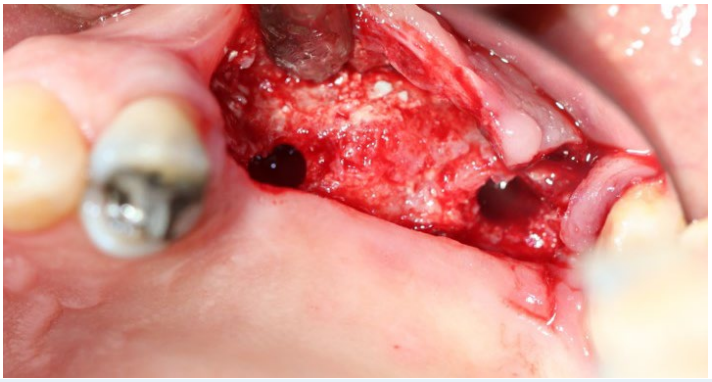
CBCT of #25 (13). We can consider a Closed Sinus Lift.

Fig. 7



Reentry 3 months post-op.

Fig. 8



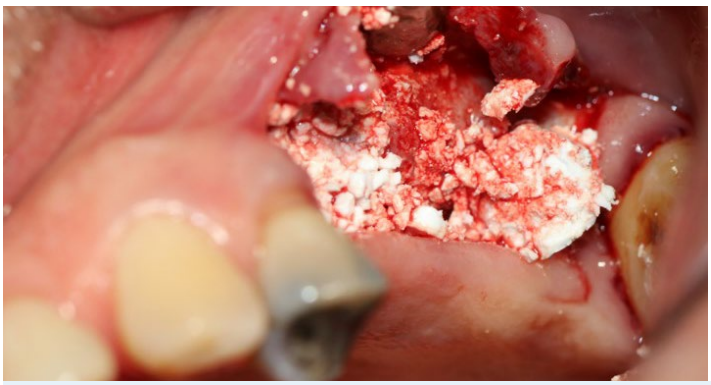
Osteotomies were performed to reach up to the sinus floor.

CASE #1

CLINICAL EVIDENCE

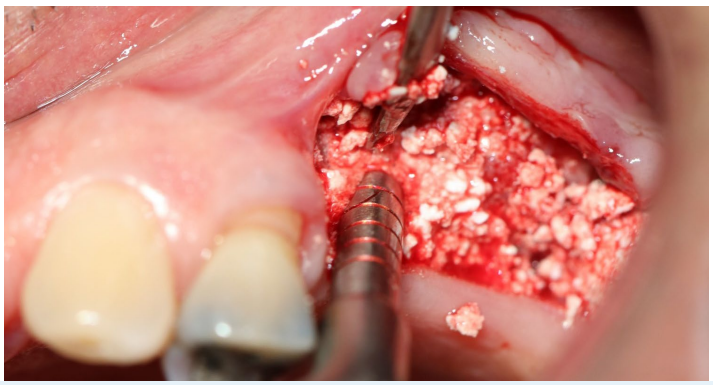
CLOSED SINUS LIFT

Fig. 9



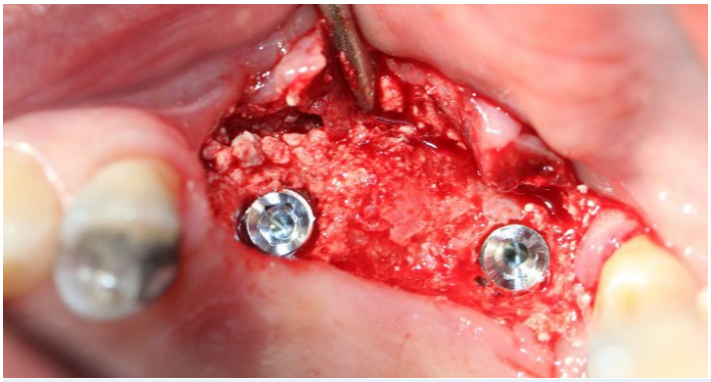
Placement of Bond Apatite®.

Fig. 10



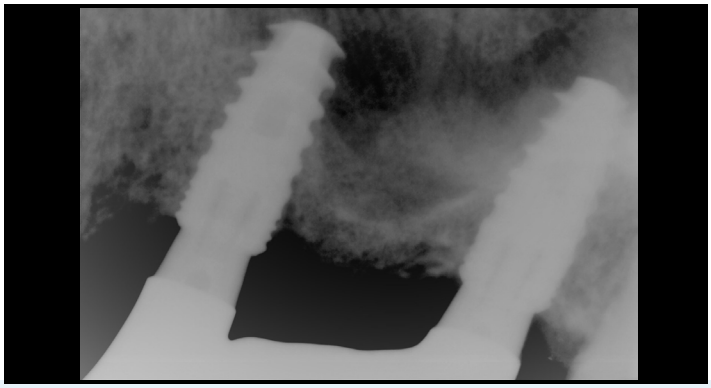
Pushing of material using the osteotome.

Fig. 11



Placement of 2 implants, 5 by 10mm.

Fig. 12



X-ray – 1 year post-op.

CASE #1

EXPERT TIPS

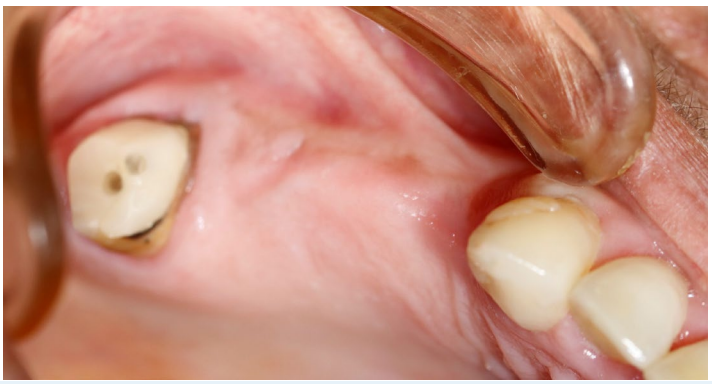
- We went from a situation where we only had 1mm of bone and we ended up with 4mm below the sinus floor. This allowed us to perform a closed sinus lift procedure.
- The characteristics of Bond Apatite® reduce the risk of perforating the membrane due to the soft texture of the cement.
- Moreover, Bond Apatite® enabled us to achieve true bone regeneration in the sinus and around the implants.

CASE #2

CLINICAL EVIDENCE

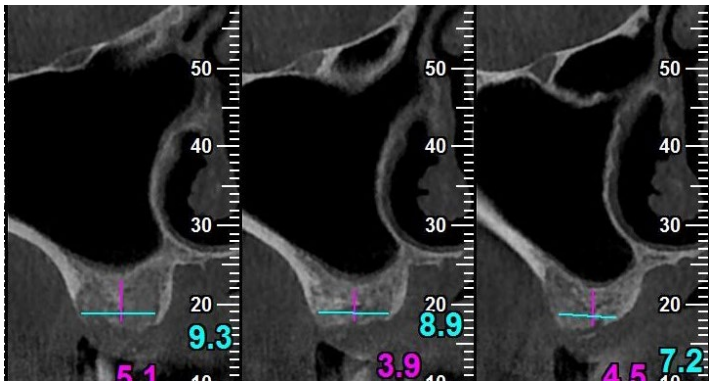
CLOSED SINUS LIFT

Fig. 1



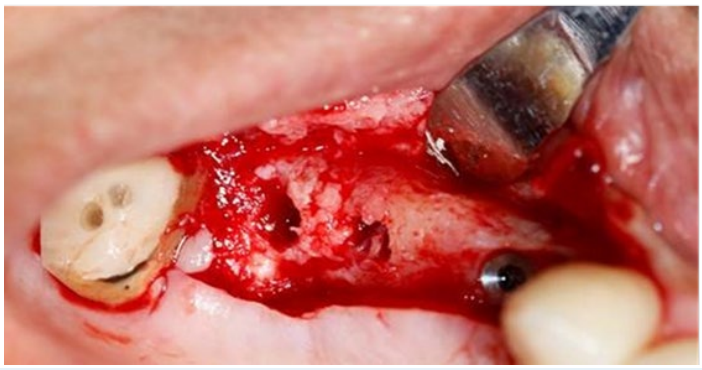
Pre-op – augmentation is required in teeth #14 (5) - #16 (3).

Fig. 2



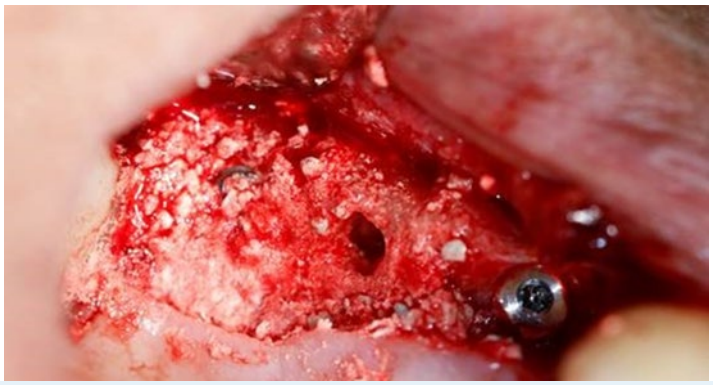
CBCT indicates we have 4mm of bone which is required to perform an intra-crestal sinus lift (Summers' technique).

Fig. 3



#15 (4) - #16 (3) – two implant osteotomies reach up to the sinus floor.

Fig. 4



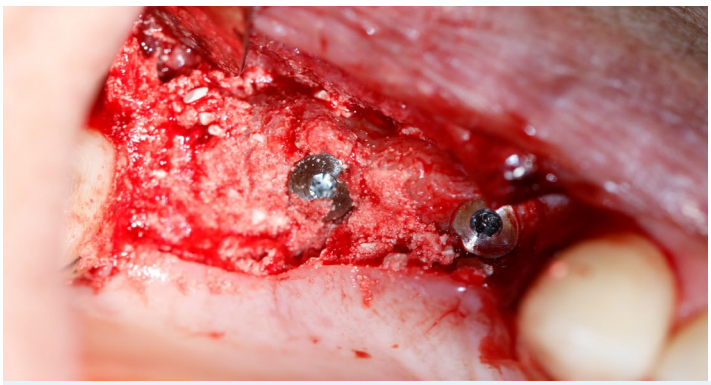
Bond Apatite® is used to augment the sinus.

CASE #2

CLINICAL EVIDENCE

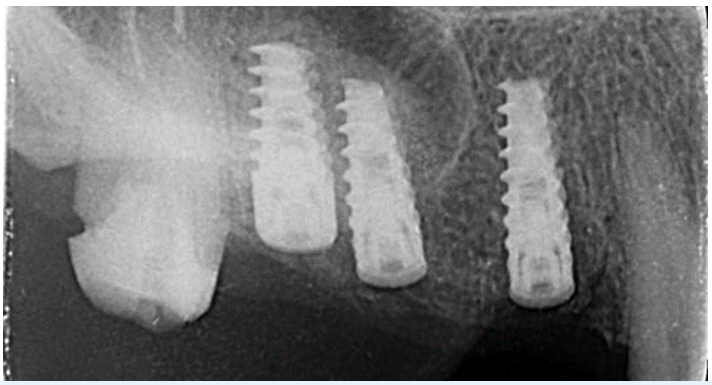
CLOSED SINUS LIFT

Fig. 5



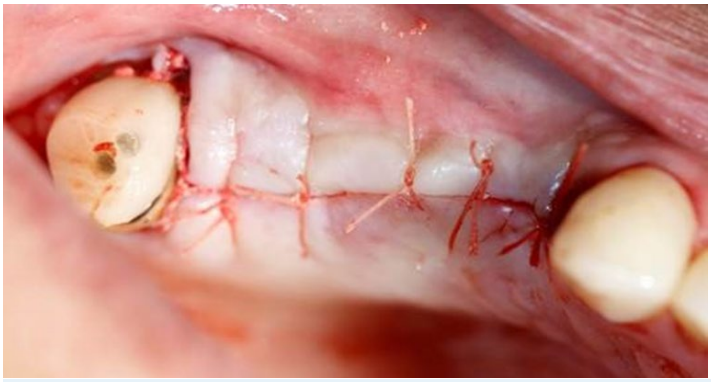
Implant in place after performing the Summers' technique in #15 (4) - #16 (3).

Fig. 6



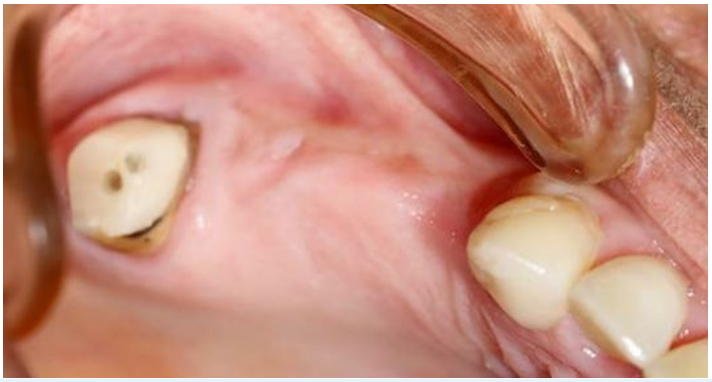
Periapical X-ray – immediate post-op.

Fig. 7



Soft tissue closures & sutures.

Fig. 8



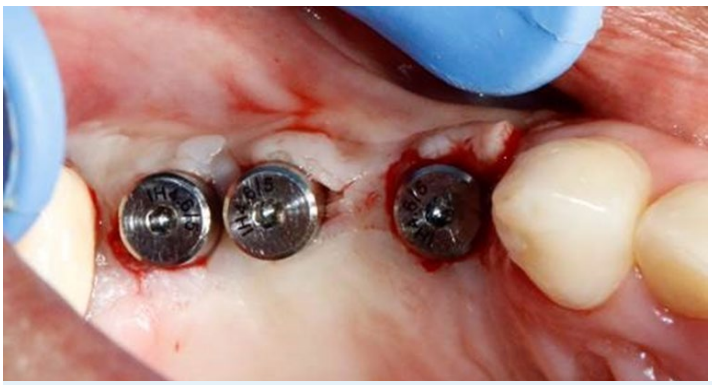
3 months post-op – soft tissue appearance.

CASE #2

CLINICAL EVIDENCE

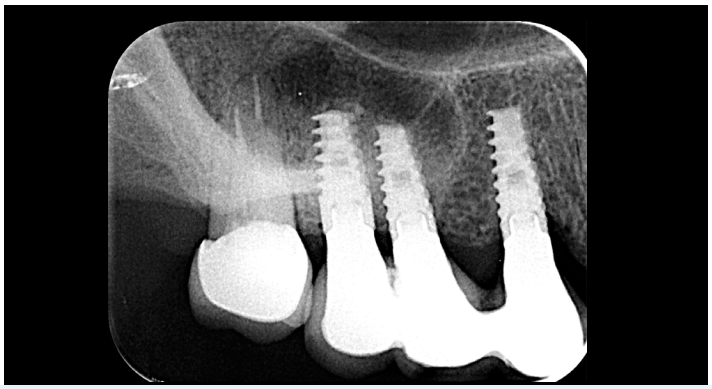
CLOSED SINUS LIFT

Fig. 9



preserving the keratinized gingiva during placement of the healing abutments.

Fig. 10



X-ray – 1 year post-op.

EXPERT TIPS

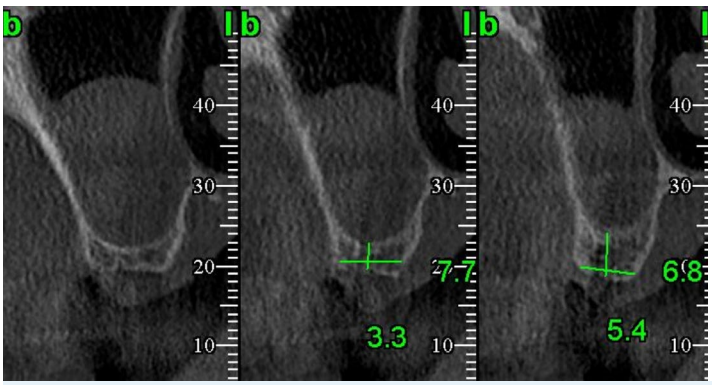
- Radiographic appearance at the time of graft placement appear radiopaque.
- 3 weeks post-op the appearance is radiolucent.
- 3-4 months post-op the appearance will again become radiopaque.
- 1-year post-op X-ray demonstrates the bone gained in the augmentation procedure.

CASE #3

CLINICAL EVIDENCE

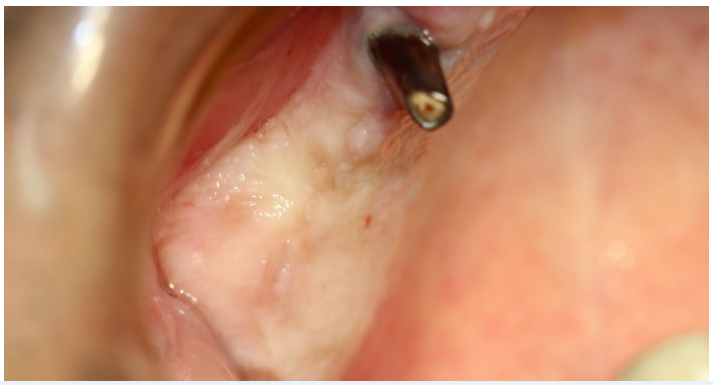
CLOSED SINUS LIFT

Fig. 1



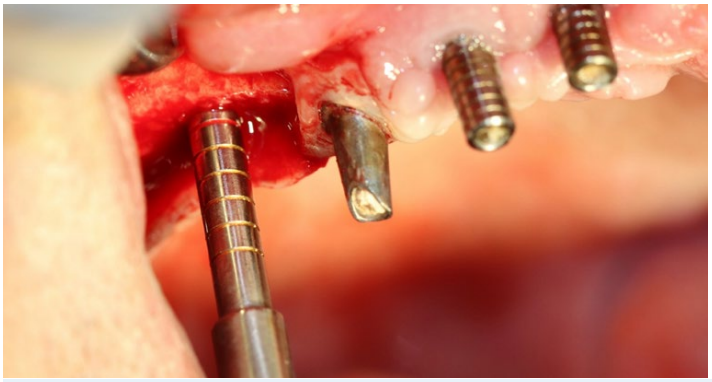
Pre-op CBCT of the area #16 (3) - #17 (2).

Fig. 2



Pre-op.

Fig. 3



Pushing the Schneiderian membrane with an osteotome.

Fig. 4

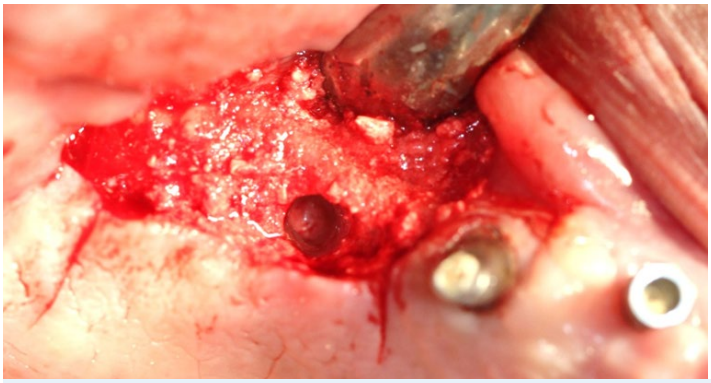
Applying Bond Apatite® in a sterile dish and waiting for 3 minutes.

CASE #3

CLINICAL EVIDENCE

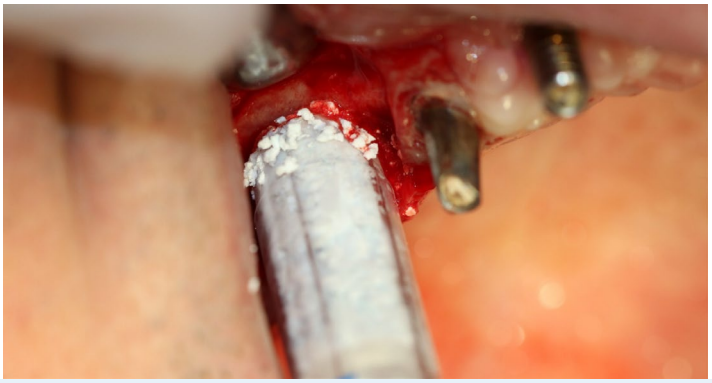
CLOSED SINUS LIFT

Fig. 5



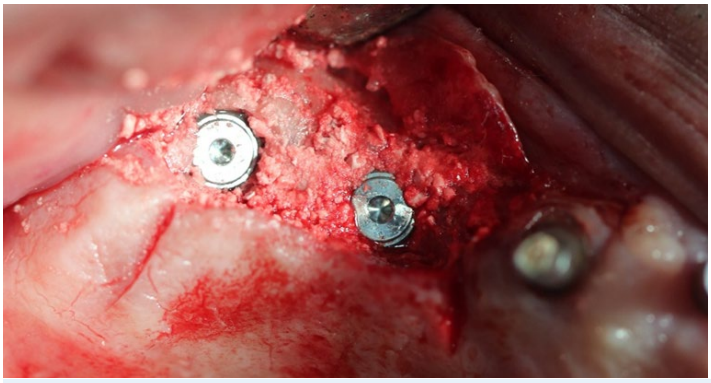
Beginning Summers' technique sinus lift.

Fig. 6



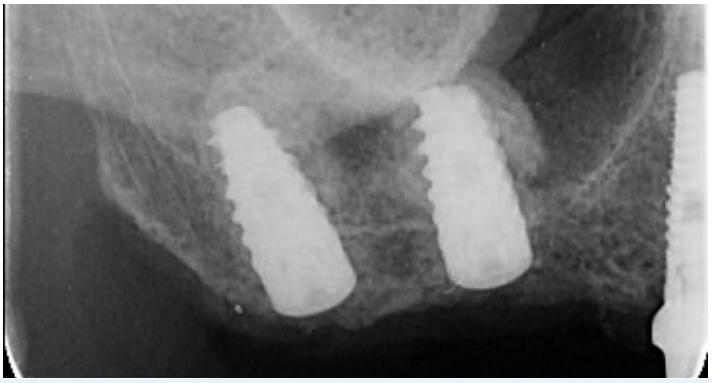
Filling the osteotomy with Bond Apatite®.

Fig. 7



2 implants in place.

Fig. 8

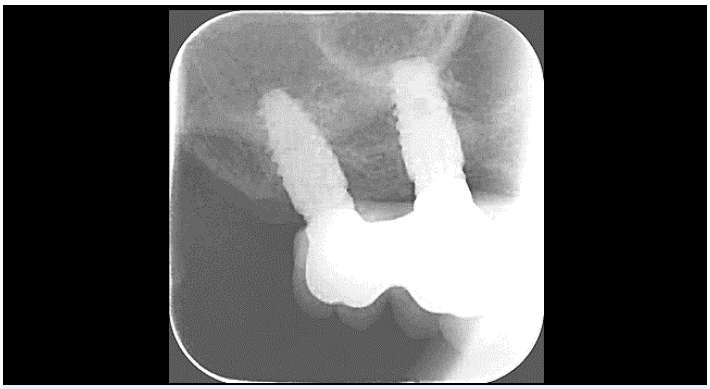


X-ray – 1 week post-op.

CASE #3

CLINICAL EVIDENCE | CLOSED SINUS LIFT

Fig. 9



X-ray – 1 year post-op.

EXPERT TIPS

While filling the osteotomy:

- Inject the Bond Apatite® particles.
- Push the particles with an osteotome.
- Add additional layer of Bond Apatite® as needed and push again with an osteotome to elevate the membrane.
- Insert the implant into the osteotomy.

LEARN MORE

Closed Sinus Lift/Intra-Crestal Approach

INTRUCTIONAL VIDEO

ON-DEMAND WEBINAR

LIVE SURGERY

SURGICAL PROTOCOL

Open Sinus Lift/Lateral Window Approach

STEPS

Watch the video

1 **Prepare your access window and elevate the sinus membrane.**

2 **Activate the syringe and wait one minute.**

3 **Eject the cement into the sinus cavity.**

4 **Repeat the process until 2/3 of the sinus is filled.**

5 **Activate a new syringe to fill the rest of the sinus.**

6 **Suture.**

EXPERT TIPS

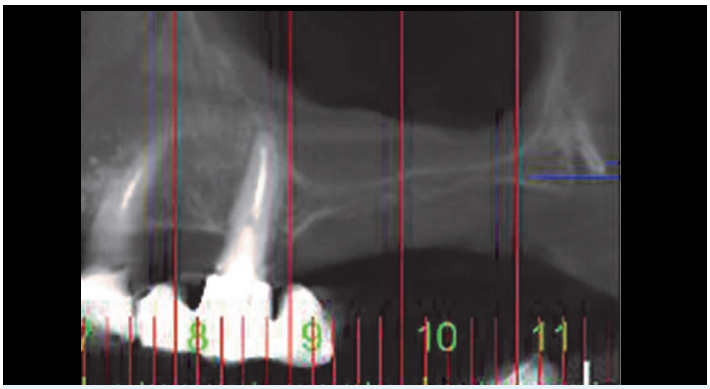
During ejection, the cement should be ejected through the crest. Then, compact it through the crest with a periosteal elevator above a dry gauze.

- Repeat this operation in the mesial, distal and the middle area until 2/3 of the sinus is filled.
- The final syringe should be injected directly after activation into the sinus cavity.
- Immediately after, press firmly with a dry sterile gauze and close the access window.
- No membrane is required.

CASE #1

CLINICAL EVIDENCE | OPEN SINUS LIFT

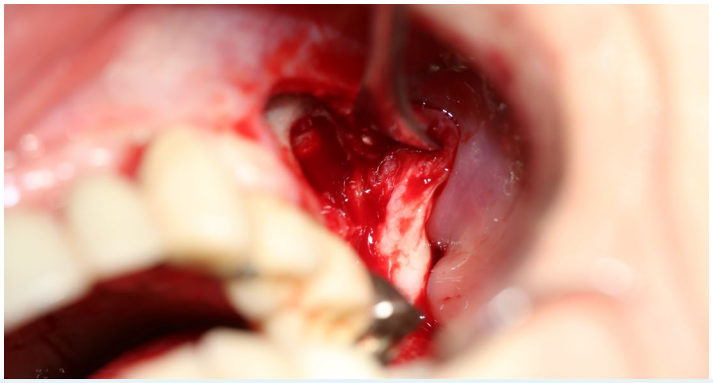
Fig. 1



Pre-op

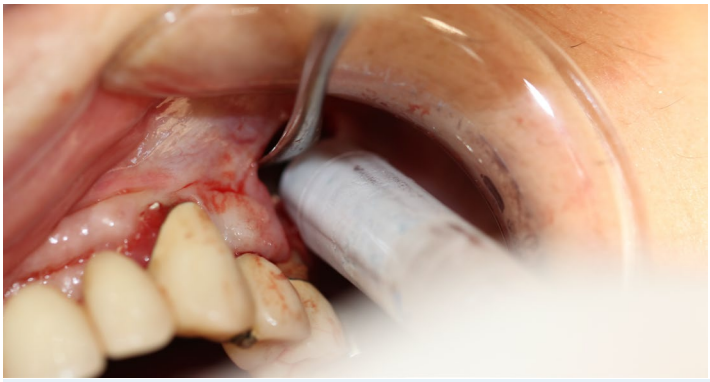
CBCT indicates the level of the left sinus floor.

Fig. 2



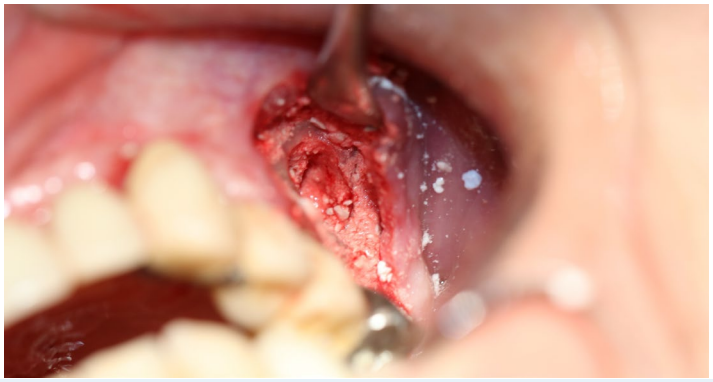
Opening the lateral access window.

Fig. 3



One minute post activating the syringe, applying Bond Apatite® in the sinus.

Fig. 4

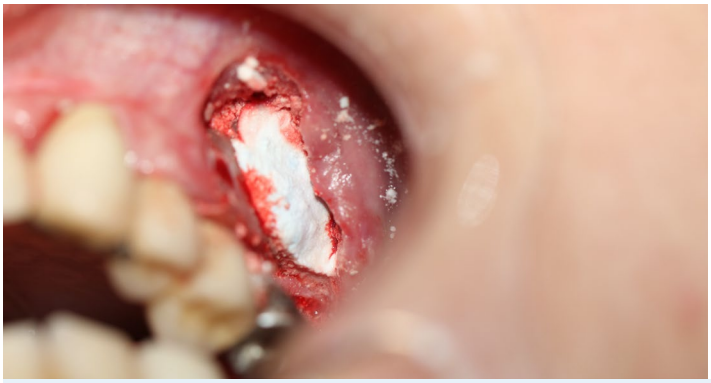


Beginning to fill up the sinus floor.

CASE #1

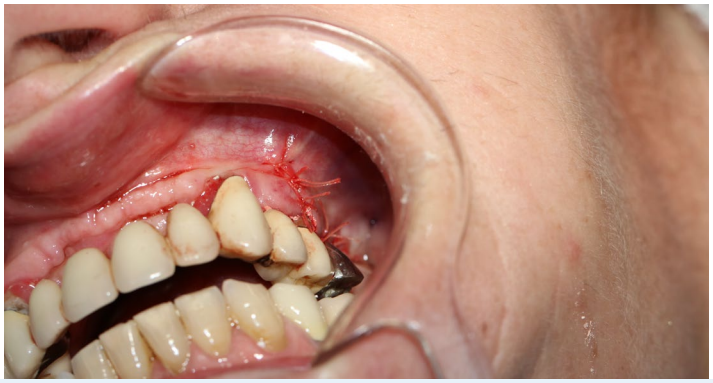
CLINICAL EVIDENCE | OPEN SINUS LIFT

Fig. 5



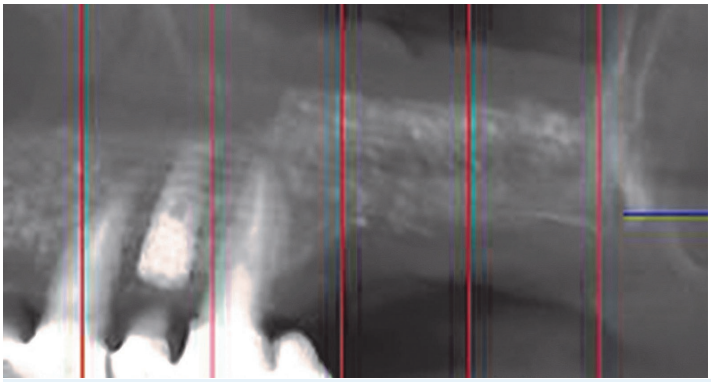
After filling of the sinus according the protocol, we use Bond Apatite® to close the window.

Fig. 6



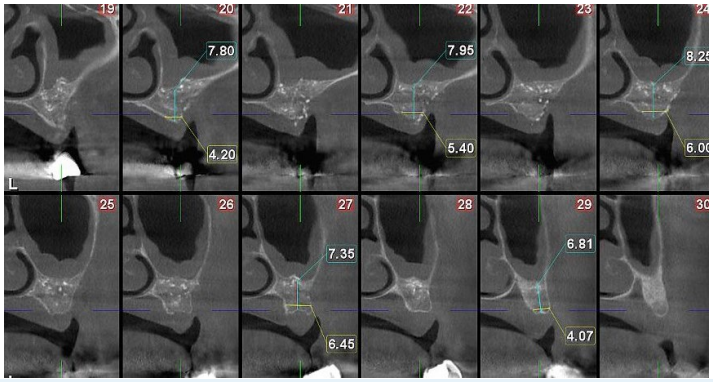
Soft tissue closure & sutures.

Fig. 7



CBCT – 4 months post-op.

Fig. 8

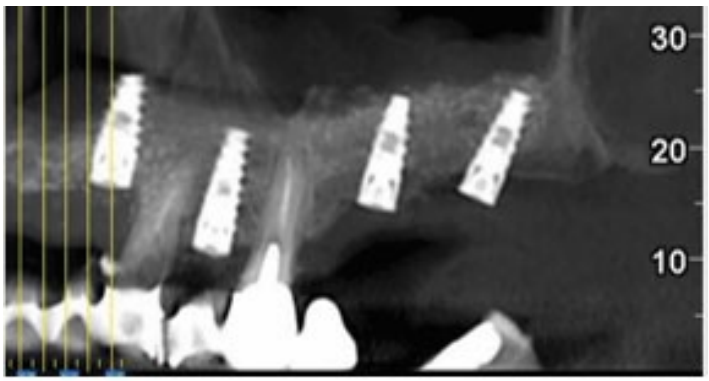


CBCT – 4 months post-op.

CASE #1

CLINICAL EVIDENCE | OPEN SINUS LIFT

Fig. 9



X-ray – 3 months post placing implants.

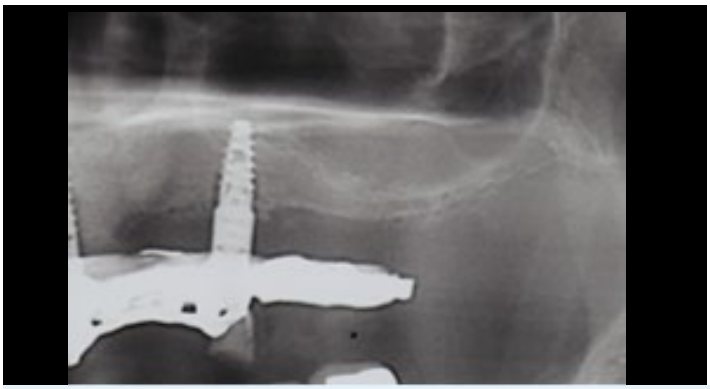
EXPERT TIPS

- For closing the sinus window, the last syringe is injected immediately after its activation.
- Notice the bone volume differences between CBCT 4 months post-op and CBCT 3 months post placing the implants (the bone is in a continuous process of maturation).

CASE #2

CLINICAL EVIDENCE | OPEN SINUS LIFT

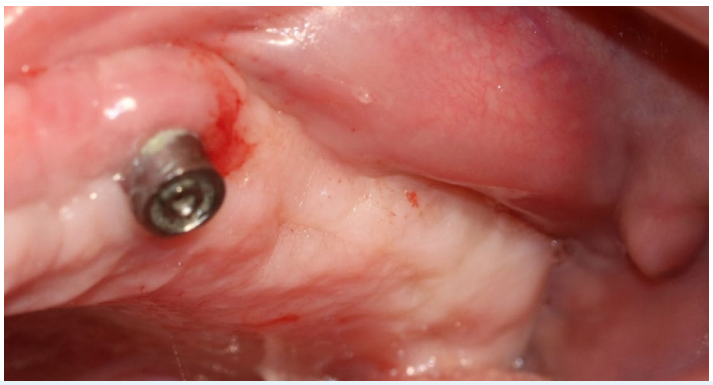
Fig. 1



Pre-op.

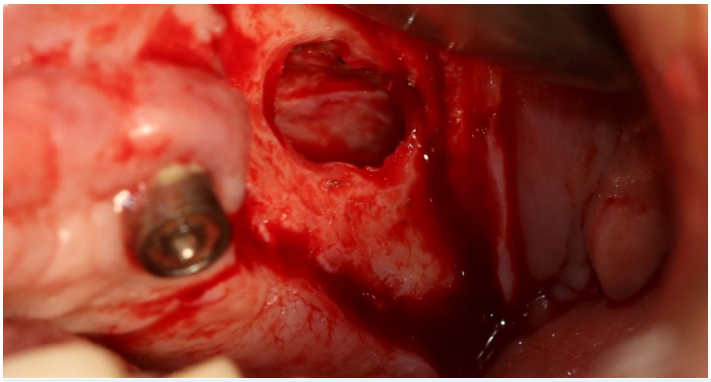
Panoramic X-ray shows the left sinus floor.

Fig. 2



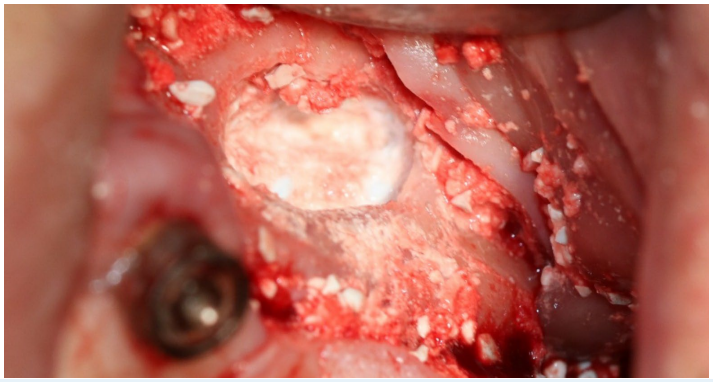
Pre-op.

Fig. 3



Opening the lateral access window.

Fig. 4

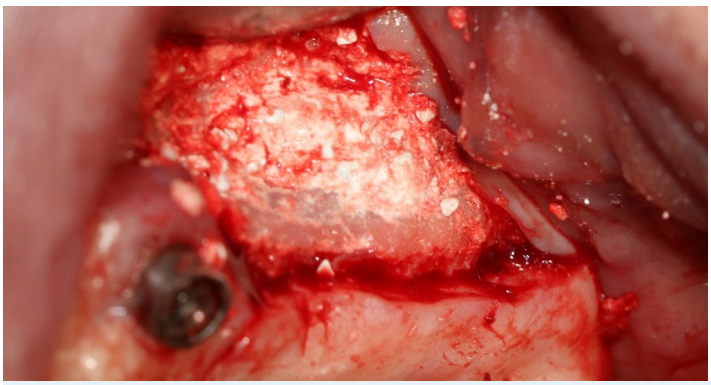


Filling up the sinus floor with Bond Apatite® according to the protocol.

CASE #2

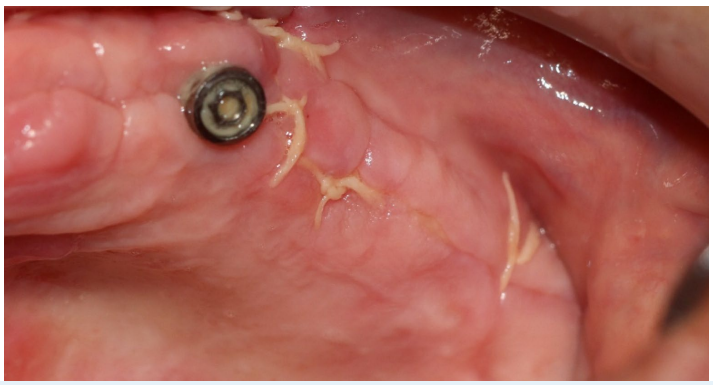
CLINICAL EVIDENCE | OPEN SINUS LIFT

Fig. 5



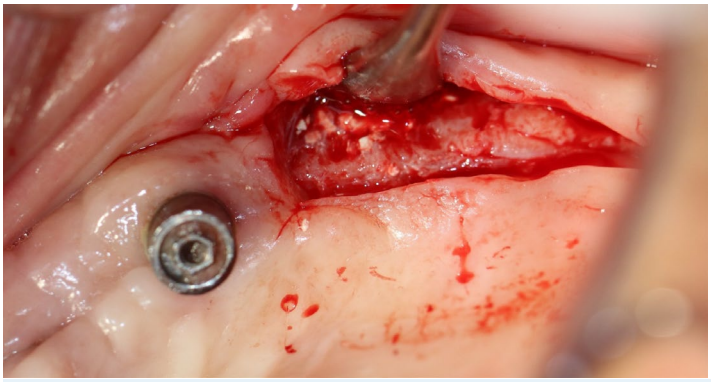
Closing the lateral window floor with Bond Apatite® .

Fig. 6



Healing – 2 weeks post-op.

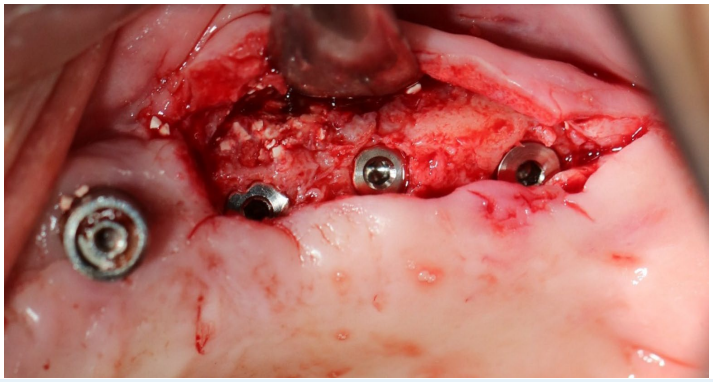
Fig. 7



Reentry – 4 months post-op.

The window is closed with the patient's own bone.

Fig. 8



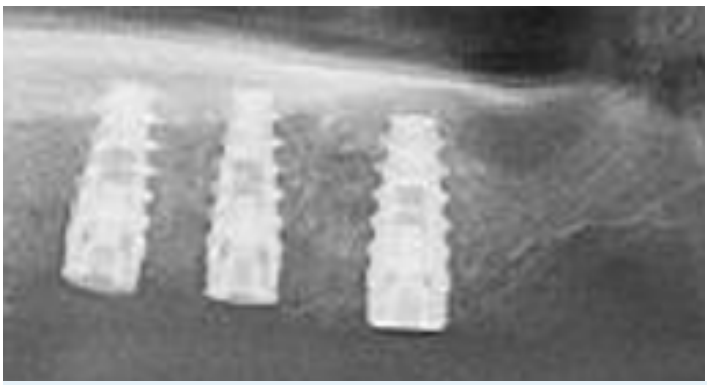
Placing 3 implants.

CASE #2

CLINICAL EVIDENCE

OPEN SINUS LIFT

Fig. 9



CBCT – 3 months post-op.

EXPERT TIPS

When drilling in the site 3-4 months post-op, you may feel the bone is soft. This is because the bone continues its calcification process.

Therefore, it is recommended to place implants 5 months post augmentation.

LEARN MORE

Open Sinus Lift/Lateral Window Approach

INTRUCTIONAL VIDEO

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Meet the Expert

David Baranes, DMD

- Graduated from the Doctorate program in Dental Surgery at the University of Paris 7 in 1987.
- Completed a C.E.S biomaterials applied to dentistry.
- C.E.S in Periodontology at the University of Paris 7.
- Completed a post-graduate course in implantology (A.U.I) at the PARIS 7 Faculty.
- Since 1991 working exclusively in periodontal and basal implantology in Jerusalem and Netanya.
- Fellowship and DIPLOMAT status in 2015 with the INTERNATIONAL CONGRESS of ORAL IMPLANTOLOGIST.
- International speaker with focus on clinical use of cements for bone regeneration.
- Published internationally in professional journals.

Dr. David Baranes Bone Cement Expert Page

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