



**CLINICAL REVIEW**  
**2020**

## *ACKNOWLEDGEMENTS*

BIOBank thanks the practitioners of this first review of clinical cases without whom the project would not have been possible. Thank you for sharing your BIOBank expertise through various and varied cases.

Thanks also to all our user practitioners for their trust and loyalty over the years.



## 1<sup>ST</sup> FRENCH BANK OF HUMAN BONE TISSUE

BIOBank ensures all tissue bank activities listed in the French public health code: from tissue collection to issuance of safe grafts. These steps include, inter alia, the biological selection of donors and the proper transformation of the femoral heads by using the Supercrit® process.

All these operations are done in accordance with the Good Practice rules of Tissue Banks set by the ANSM (French National Safety Agency for Health Products), transposing the European Directives into French regulations.

BIOBank grafts come from femoral heads harvested exclusively from living donors during hip arthroplasties. As such, the tissue is removed during a surgery in the operating room, guaranteeing optimal quality and asepsis. All samples are obtained in France only by orthopaedic surgeons within approved health care establishments.



## OUR VALUES

### **QUALITY**

Through the commitment of all its staff, BIOBank undertakes to offer products and services of irreproachable quality.

### **RIGOUR**

By applying the strictest standards and regulations, BIOBank guarantees the safety of its products in compliance to laws and ethics.

### **INNOVATION**

To meet the current and future needs of surgeons and patients, BIOBank increasingly invests in research and development.

## OUR SUPERCIT® PROCESS

Our Supercrit® process is based on delipidation of bone tissue using CO<sub>2</sub> in supercritical state, combined with a chemical viro-inactivation. The extraction technology using supercritical fluids has been applied for the first time by BIOBank to the human bone tissue.

Due to its low viscosity and its high solvency properties, supercritical CO<sub>2</sub> has an incomparable delipidating efficacy, without aggressive action on the bone matrix.

The purpose of this procedure is to ensure maximum viral safety, in-depth cleaning of the trabecular structure and preservation of the natural biomechanical properties of the collagen and mineral structure of the bone tissue.

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**Dr. Stéphane ALBARET (30)**

- ▶ Graduated from the Faculty of Montpellier, 1996
- ▶ University Diploma of surgery and implant prosthesis Lyon, 2004
- ▶ AFH-DGOI competent implantology certificate
- ▶ Exclusive practice in periodontology and implantology
- ▶ User of BIOBank's products since 2004



**CLINICAL CASE**

M. L. is sent in August 2012 following the extraction, 3 months earlier, of tooth 23 having presented several infectious episodes. Clinical and radiological examinations show vertical and horizontal tissue loss at this level. It was decided to perform an allogeneic onlay bone graft on the crest to recreate the volume in all 3 dimensions. 5 months later, an implant will be delivered and then, the ceramic crown will be made. We saw the patient again in June 2020 for clinical control and 3D imaging showing bone tissue stability 7 years after the allogeneic grafting.



1. Clinical examination reveals tissue loss at the level 23.



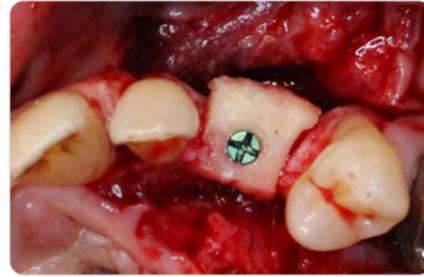
2. Radiological examination reveals a vertical bone loss of 4-5mm and reduced thickness.



3. Elevation of the full-thickness flap objectifies the vertical and horizontal loss as well as a fibrous bone of poor quality.



4. Site appearance after fibrous bone cleaning, vertical loss of about 4mm.



5. Occlusal view of the BIOBank's allogeneic bone plate adapted to the defect and fixed by an osteosynthesis screw.



6. Lateral view showing the fit of the graft to the remodelled bone defect after cleaning, bone stimulation in apical.



7. Harmonization with BIOBank's allogeneic cortico-cancellous powder, then the graft will be covered with a collagen membrane before the passive closure of the flap.



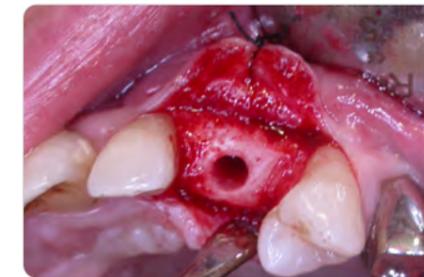
8. Graft healing control X-rays. At 5 months, the bone seems to densify.



9. 3D at 5 months: vertical and horizontal gain.



10. 5 months re-opening showing graft integration.



11. Implant drilling showing a "living" vascularized bone.



12. Ceramic crown in place and proper profile of vestibular tissues.



13. 1 and 7 years control X-rays: bone stability.



14. 7 years 3D post-graft imaging showing a perfect bone volume stability.



15. 7 years clinical view.

**CONCLUSION**

Like an autologous grafting, the indication of the allogeneic grafting must be well placed and must be executed with the same rigour to be reliable. The main advantage of the allogeneic plates compared to the autogenous ones (in addition to the absence of the second collection site) is a thick layer of cancellous (and low cortical) which makes it easier to adapt the graft to the defect and compensate for relatively large losses of substances. Finally, this clinical case confirms the stability over time of the BIOBank's allogeneic bone graft which has been completely replaced by the patient's living bone.



**Dr. Rémy CAHUZAC** (40)

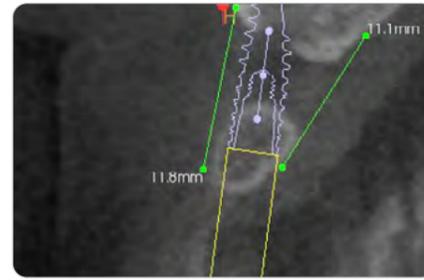
- ▶ Graduated from the Faculty of Toulouse, 1987
- ▶ University Diploma of rehabilitation of the maxillaries, Toulouse
- ▶ Exclusive practice in periodontology and implantology



**CLINICAL CASE**

A 68-year-old patient, in perfect health, sent to replace his 22 tooth with an implant. The CBCT shows transverse bone deficit and a significant vestibulo-palatine perforation. The treatment plan is as follows:

- GRT with allogeneic bone (BIOBank cancellous bone powder "S") + platelet concentrate + tensile membrane
- 5 months healing
- Implants 3.5mm x 10mm placement in two steps
- 3 months osteointegration wait
- Activation with immediate provisional restoration
- Screw-retained definitive crown 3 months later



1. Pre-operative CBCT.



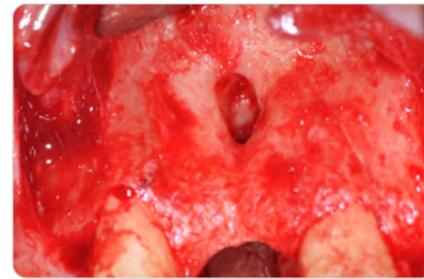
2. Transverse defect.



3. Keratinized vestibular band.



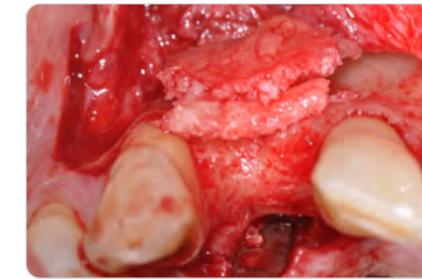
4. Pre-operative occlusal view.



5. Vestibulo-palatine perforation.



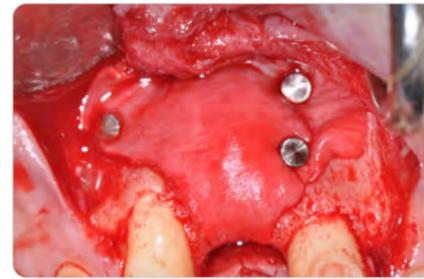
6. BIOBank's particulate graft + fibrin; vestibular view.



7. BIOBank's particulate graft + fibrin; occlusal view.



8. Cutting and adjusting the membrane away from the teeth.



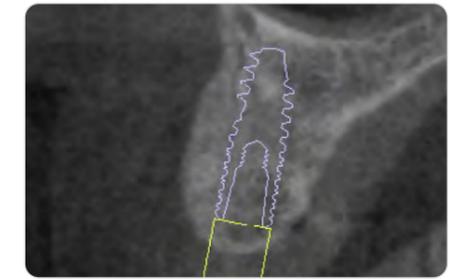
9. Strict immobilization.



10. Pre-operative occlusal view at 5 months.



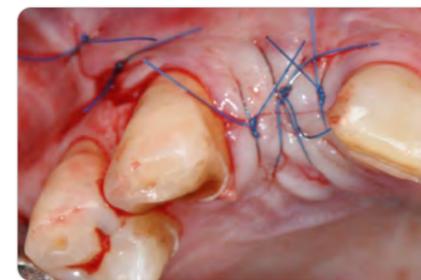
11. Intra-operative occlusal view at 5 months.



12. Post-operative CBCT at 5 months.



13. Implant In-Kone® Global D in sub-crestal position.



14. Non-resorbable monofilament sutures.



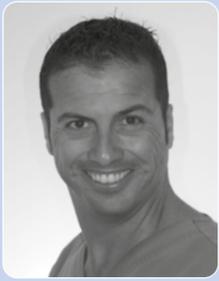
15. X-ray control at 2 months.



16. Crown in use carried out by Sébastien MARTINIE and Dr. Natacha RUCHAUD.

**CONCLUSION**

The use of a hydrated particulate graft with a patient's fibrin concentrate allows material cohesion and mechanical stability enhanced by the tension and perfect immobilization of the membrane. In addition, biocompatibility is likely to be improved and the penetration of the neovascularization undoubtedly favoured over the alternative of grafting with a cortico-cancellous bone plate.



**Dr. Daniel CAPITÁN-MARAVER** (ES)

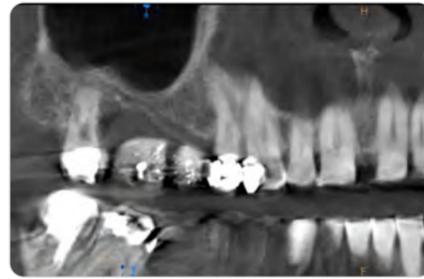
- ▶ Degree in dentistry, Faculty of Dentistry, Barcelona in 2003
- ▶ Degree in clinic implantology and oral prosthesis, Faculty of Dentistry, Barcelona 2003
- ▶ Master in research in dentistry sciences, Barcelona 2012
- ▶ Clinical master's professor in implantology and oral prosthesis, University of Barcelona since 2007
- ▶ Director and Professor of the advanced surgery dental implantology, University Foundation of Bages, Manresa
- ▶ Coordinator, lecturer of the University course in implantology and oral prosthesis, University of Barcelona, Bellvilge Campus



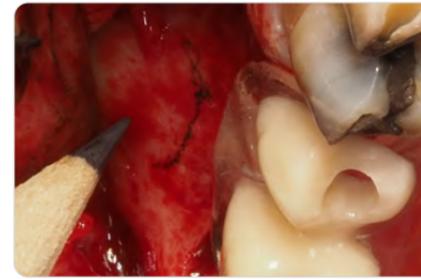
**CLINICAL CASE**

We present the following clinical case of sinus elevation in a 48-year-old male patient, showing an edentulism from 15 to 16. The bone height between the crest and the maxillary sinus floor was insufficient for implant rehabilitation. It has been decided to carry out a sinus elevation of the area by lateral approach first and filling with BIOBank's allograft and Lyoplast® bovine pericardium membrane. The bone gain increased from 3.8mm to 14mm total height in 5 months, with good quality and density of the graft at re-opening.

**RIGHT SINUS ELEVATION BY LATERAL ACCESS AND BIOBANK**



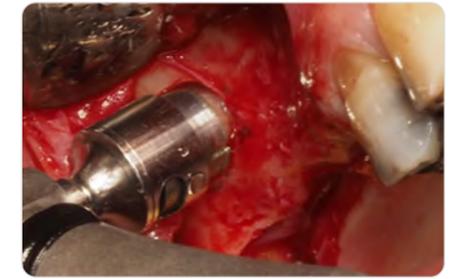
1. Available height from bone crest to maxillary sinus floor from 3.8mm in position 16 according to CBCT and surgical guide.



2. Thanks to the surgical guide, we mark the correct location of the sinus access window (prosthodontically guided sinus elevation).



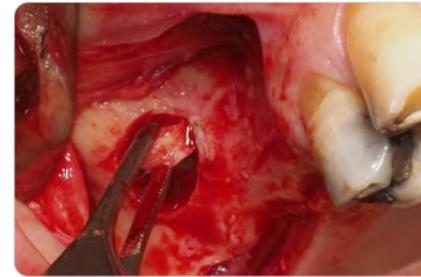
3. Positioning of the cutting instrument at the line previously made.



4. Window cut-out using the Masai® system.



5. You can appreciate the clean, uniform and precise access achieved on the vestibular cortical.



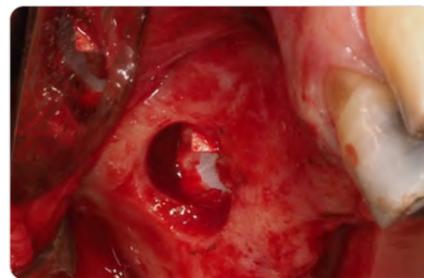
6. Removal of the cortical flap that gives access to the sinus.



7. Start of detachment of the Schneider membrane.



8. The membrane is reclined to allow the insertion of the biomaterial into the sinus.



9. Membrane placement in the cavity created by handling the sinus membrane to protect it from biomaterial "deposit".



10. Preparation of BIOBank's biomaterial and Lyoplast® membrane.



11. Rehydration of BIOBank's bone powder directly in the vial.



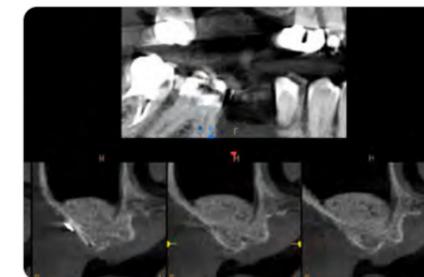
12. Compaction of the biomaterial using an insulin syringe to facilitate transport.



13. Repositioning of the access bone flap to the maxillary sinus.



14. Securing the Lyoplast® membrane externally to the access to stabilize the graft.



15. Final CBCT with a gain of 14mm of crest bone height at the maxillary floor.

**CONCLUSION**

Sinus elevation by lateral access and filling with BIOBank's allograft is an effective and predictable treatment according to our experience in this type of regeneration. Allograft allows earlier re-opening, about 5 months, because remodelling of this type of biomaterial is faster than others, including xenografts, for which re-opening often requires more waiting time.



**Dr. Jean-Jacques CHALARD** (69)

- ▶ Doctor in dental surgery, Dental University of Lyon
- ▶ Qualified specialist in oral surgery
- ▶ Advanced Degree in biological and medical sciences
- ▶ Former assistant of the University of Lyon
- ▶ Former hospital assistant of the Hospices Civils of Lyon implantology functional unit

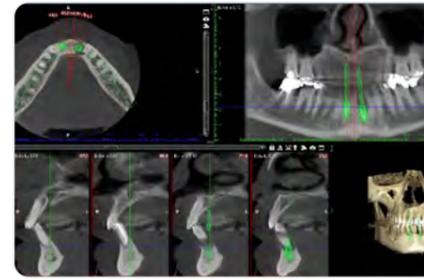


**CLINICAL CASE**

M. G. 58-year-old, in good general health, consults for terminal mobility and significant bone loss in the 4 mandibular incisors. After clinical and radiological analyses, it is decided to install 2 implants supporting a ceramic bridge implant-retained. A filling of the hiatus is carried out using the allogeneic bone of BIOBank as well as the placement of a PRF (Platelet Rich Fibrin) membrane. The implantation is followed by implant loading with an immediate aesthetic temporary bonded bridge.



1. Initial situation with significant gingival recessions.



2. 3D pre-operative radiography, digital planning.



3. Atraumatic dental avulsion of the 4 mandibular incisors.



4. Immediate implantation of two MIS® implants.



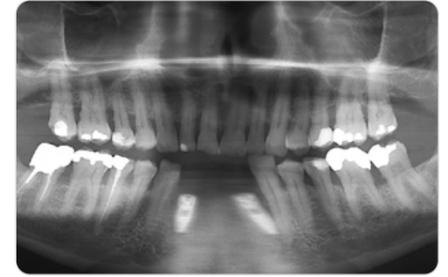
5. Bone deficit filling with BIOBank's allogeneic bone.



6. Placement of the PRF membrane.



7. Realization of sealed stitches.



8. Post-operative control panoramic X-ray.



9. Immediate aesthetic temporary bonded bridge.



10. Panoramic X-ray after 2 months shows good osteointegration.



11. Setting up of healing caps.



12. Screwing of the "scan bodies" on the implant for digital print.



13. Digital print transmitted to the Ardentek laboratory.



14. Final prosthetic result, ceramic bridge implant-retained performed by Dr. Vincent FAIVRE.

**CONCLUSION**

The anterior sector represents an important aesthetic issue. The extraction, implant placement and loading with an immediate nonfunctional provisionalization is a technique of choice when the indication is well placed. It represents a reliable alternative to conventional protocols with many benefits for both the practitioner and the patient. The good management of peri-implant tissue using allogeneic bone substitutes has many advantages and makes it possible to consider implant replacement of anterior teeth with a predictable and aesthetic result.



**Dr. Pierre CHERFANE** (75)

- ▶ Implantology – Periodontology, Paris
- ▶ Former attaché to the University Degree of surgical implantology and prosthetics, Paris
- ▶ Advanced Degree in periodontology



**CLINICAL CASE**

50-year-old patient, smoker (2 cigarettes a day), presents a root fracture of 47, bridge pillar 47-45. A screw-retained prosthesis rehabilitation on 2 implants at level 46 and 47 is planned. The crest resorption on 2 implants at level 46 requires an horizontal per implant increase. After initial periodontal therapy, 47 is extracted and a Cone Beam is performed 3 months later.



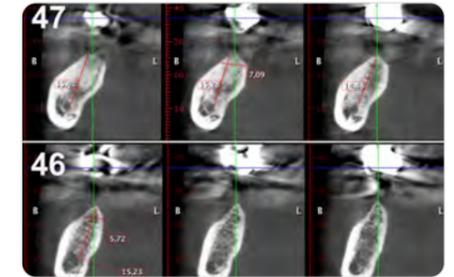
1. A root fracture of 47, bridge pillar 45-47 indicates tooth extraction.



2. The replacement of 46 and 47 by implants is planned.



3. Occlusal view of reduced crest thickness in 46.



4. CBCT confirming the reduced thickness of the crest in 46.



5. Identification of the horizontal component of the defect after site preparation of 46.



6. The implant 46 presents several spires exposed in the vestibular.



7. Absorbable collagen membrane (Creos™, Nobel Biocare, France), stabilized apically and lingually by titanium screws (Profix, Dentalforce, France).



8. The membrane contains the BIOBank cortico-cancellous granules firmly.



9. After periosteal dissection, passive closure of the flap with 6/0 nonresorbable monofilament.



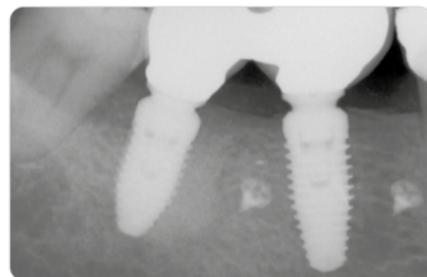
10. Complete bone regeneration from the defect covering the spires (8 pre-operative months).



11. Laying of conical abutments for screw-in restoration.



12. Good aesthetic and functional integration of the screwed bridge at 2 years (zirconium framework).



13. Crestal bone level stability at 2 years.

**CONCLUSION**

Several authors recommend the use of a mixture of autogenous bone and filler material with a ratio of 1:1 combined with a resorbable membrane for horizontal increases in atrophic crests. In this case, the average size defect is filled exclusively with BIOBank products avoiding the use of autogenous harvesting and thus reducing the length and complexity of the surgery. The quality and quantity of bone regeneration are optimal and the reconstructed volume is clinically stable at 8 months and radiologically stable at 2 years.



**Dr. Thierry DEGORCE** (37)

- ▶ Graduated from the Faculty of Dental Surgery, Reims, 1993
- ▶ CES of biomaterials, cemented prosthesis and periodontology
- ▶ University degree in oral rehabilitation and implantology, surgical and prosthetic implantology, and pre and peri-implant surgery (Paris)
- ▶ Training in oral implantology and bone grafting, University of Miami, Florida
- ▶ Author of several publications in various French journals
- ▶ 15 years exclusive practice in implantology in Tours with an activity focused on implant reconstructions and aesthetic treatments



**CLINICAL CASE**

Mrs. Claudine L. aged 58, non-smoking and in good general health, comes to our consultation to consider the replacement of its periodontally compromised and unsightly 21 and 22 maxillary incisors. The patient has been suffering for several years from a periodontitis that seems stabilized. The implant reconstruction of partial/central/unilateral edentulism is one of the most complex situations: management of the maxillary anterior sector. Immediately visible when smiling, it is asymmetrical and must therefore reproduce at best, the adjacent side. The main difficulty of this clinical case lies in the reconstruction of the inter-incisor papilla.

**IMPLANT RECONSTRUCTION OF MAXILLARY ANTERIOR SECTOR**



1. The extraction indication is set for 21 and 22 which have a significant collapse of the interproximal bone peak associated with a multimillimetre gingival recession and complete disappearance of the inter-incisor papilla.



2. Retro alveolar X-ray allows to objectify the aveolysis and in particular, the collapse of the inter proximal bone peak.



3. The 2 incisors are easily extracted without lifting a flap. After curettage and irrigation, the alveoli are filled with an allogeneic cortico-cancellous particulate material (BIOBank).



4. The alveoli are closed with a thick epithelial connective tissue graft harvested from the palate. The graft is carefully sutured to previously despitheIALIZED banks.



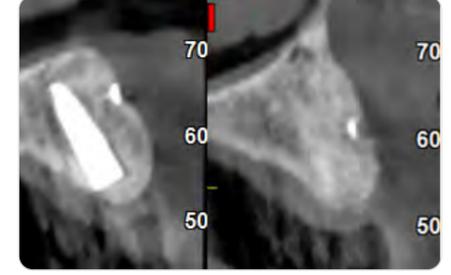
5. After 4 months of healing, a sufficient height of attached mucosa is available to ensure the covering of required bone regeneration.



6. The alveolar filling limited the resorption and provided sufficient bone volume to stabilize an implant. A full-thickness flap is lifted. An implant (V3) is placed in site 21 using a surgical guide.



7. A guided bone regeneration is performed using a wide, cross-linked, absorbable rigid membrane 30/40 (OsseoGuard®, Zimmer Biomet), and allogeneic filler material.



8. A Cone Beam made at 6 months allows to objectify the important bone volume reconstructed.



9. The mucous membrane is well healed and a large bone volume has been reconstructed. The mucogingival junction line is coronally-displaced resulting in vestibular keratinized mucosainsufficiency.



10. A very superficial partial thickness flap is made and a connective tissue graft is adapted on the site. The surgery aims to apicalize the mucogingival junction line and, increase the height of attached vestibular mucous.



11. After 2 months, the graft has well vascularized and integrated into the periodontium of adjacent teeth. The volume of attached gingiva is satisfying and the mucogingival junction line is correctly positioned. The implant is unburied by operculum and a healing screw is inserted.



12. A temporary cantilever bridge with the 22 is screw-retained. It will shape soft tissues and create profiles of aesthetic emergence with reference to the adjacent side.



13. The removal of the provisional prosthesis makes it possible to objectify the profiles of emergence drawn. Note the thickness of the mucosa in the vestibular of the implant.



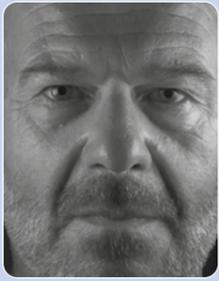
14. The definitive bridge is directly screw-retained into the implant by the cingulum. It perfectly adapts to the mucous profiles drawn by the transitional prosthesis.



15. Retro-alveolar X-ray also confirms good stability of the regenerated bone.

**CONCLUSION**

Management of this complex clinical case highlights the importance of good management of soft tissues, combined with the use of BIOBank's allogeneic cortico-cancellous bone in particulate form to avoid autogenous harvesting and, excellent timing to minimize the treatment time. Only 3 surgeries and 10 months of treatment until the placement of a temporary fixed bridge, comfortable, aesthetic, were necessary. In the end, the prosthesis is well integrated into an aesthetic bone and mucous environment, thick and well keratinized which should guarantee the stability of the result over time.



**Dr. Jean-Pierre GARDELLA** (13)

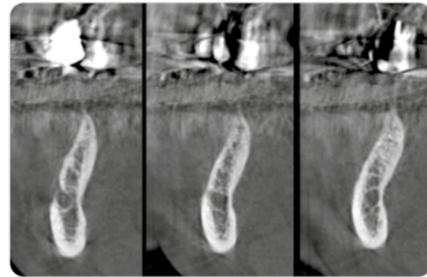
- ▶ Exclusive practice of periodontal and implant surgery since 1988 in private practice in Marseille.
- ▶ Manages and animates IAED, Institute for Advanced and Aesthetic Dentistry



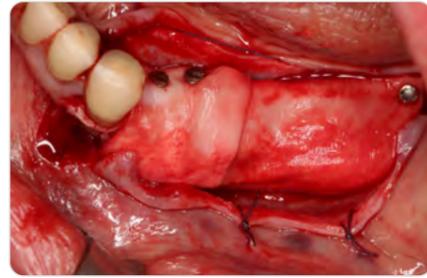
## CLINICAL CASE

The reconstruction of atrophied edentulous crests is a challenge in the treatment of patients. The placement of implants according to a fixed prosthetic project upstream of surgery, is a key factor in the long-term success of our restorations. If the use of tissue bank grafts significantly decreases the morbidity of the surgery, however, its success largely depends on perfect management of incision patterns and soft tissues release to obtain a tension-free closure of the flaps. The bone reconstruction, whatever the nature of the graft, is a difficult surgery: we will also have to consider, before indicating this surgery, parameters dependent on the patient's ability to heal well (tobacco, distorted immune system, wearing a removable prosthesis, etc...).

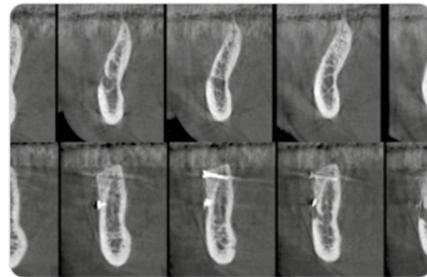
## HORIZONTAL RECONSTRUCTION OF A POSTERIOR MANDIBULAR ATROPHIED CREST



1. Initial CBCT section. A marked narrowing in the coronary area and a "knife blade" appearance is observed.



5. A second collagen membrane is positioned identically on the anterior part, in order to serve as a wallet for the same type of mixture. All the fixing pins on the lingual side of the site are perfectly distinguishable.



9. 5 months scanner. Note a consequent reconstruction without signs of resorption. A perfect contiguity between the receiving site and the different grafts. A surgical context specific to the installation of 3 implants planned in the master project.



13. Closure of the site. 3 healing abutments are connected and the site is closed with discontinuous sutures, (6/0 monofilament). Special care has been taken to best distribute keratinized tissue around implants.



2. Rehabilitation of the edentulous distal area of the 33. Note the presence of a band of keratinized tissue along the crest. The horizontal component of the vestibular remains important and foreshadows a good possibility of flap release.



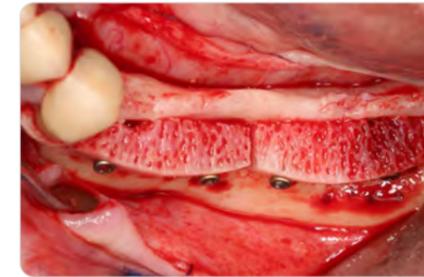
6. An incision in the periosteum and a careful dissection using a foam instrument, allows us to obtain an excellent laxity in the vestibulo-lingual sense of the vestibular flap, well beyond the crestal area.



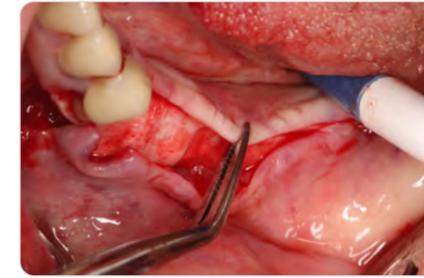
10. 5 months clinical postoperative clinical view. The mucosal healing shows a closure in first intention, guarantee of a hoped-for reconstruction.



14. Occlusal view of bridge at 4 years post-operative. The ideal 3D positioning of the implants allowed a screw-retained design of the prosthesis.



3. The cortico-cancellous grafts, screwed into vestibular with the residual bone (4 Mondéal® 8mm osteosynthesis screws). Note the adaptation of grafts to the receiving site and the tropism of the cancellous part immediately colonized by blood.



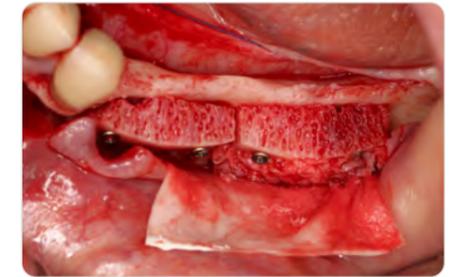
7. On the lingual side, this release is obtained in plain thickness in the most posterior part, by dissection of the mylo-hyoid muscle in the middle part and dissection in the lingual floor in half thickness.



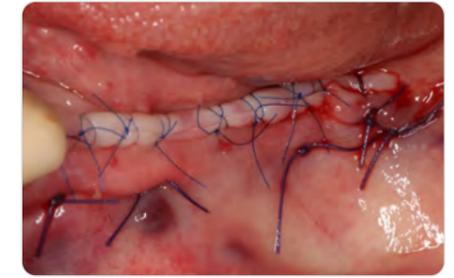
11. 5 months post-operative re-entry. Proper horizontal reconstruction: no signs of resorption around the osteosynthesis screws. Inability to distinguish native bone from added allogeneic bone.



15. Vestibular view at 4 years post-operative. Note the perfect peri-implant mucous health obtained from the cooperation of the patient and presence of keratinized mucous band.



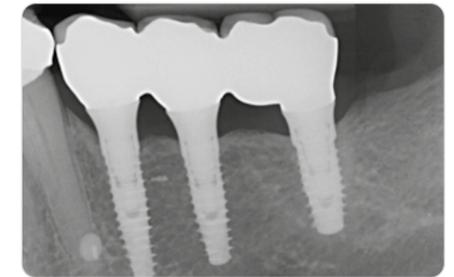
4. A collagen membrane is positioned using titanium pins at the base of the allogeneic grafts. The space between it and the grafts is filled with a mixture of autogenous bone (bone scrapper) and cancellous allogeneic bone.



8. The flaps are sutured on 2 plans: 3 sutures in 4/0 at the base of the 2 flaps intended to confront a maximum of conjunctive surfaces then, cross-stitches in 6/0 ensuring closure of the coronary areas.



12. After removal of the fixing elements (except mesial pin), 3 implants are placed with insertion couples ranging from 35 to 45N.cm. Note that these fixtures are entirely in the grafted bone, with the exception of their lingual side.



16. 4 years retro-alveolar X-ray control. This X-ray confirms the excellent crestal bone stability.

## CONCLUSION

The use of allogeneic grafts is for us, not only a therapeutic alternative, but a first choice in the treatment of atrophied crests. Information given to patient is obviously mandatory and the choice of the reconstruction material is definitively his. The company BIOBank has been bringing for years, proven guarantees in the treatment of grafts, available for colleagues and patients. The triple ratio "biological cost/implementation/morbidity" is obviously in favour of allogeneic grafts, all the more so as the reconstruction is extensive.



**Dr. Jean-Fabien GRANGEON** (974)

- ▶ Graduated from the Faculty of Odontology of Lyon
- ▶ University Diploma of pain management, Bordeaux
- ▶ University Diploma of biomaterials and implantable systems, Bordeaux
- ▶ Graduated from the College of Oral Implantology of Marseille
- ▶ Certificate of Anatomy in Implant Surgery and Advanced Techniques (C.A.C.I.T.A) of Bordeaux



## CLINICAL CASE

50-year-old patient, for whom after an initial periodontal phase, we opted for an immediate loading of the maxillary and implant rehabilitation of posterior mandibular areas. In the same session, we performed the avulsion of the residual maxillary teeth, the delivery of 8 implants, the vestibular "sticky bone" onlay graft covered by PRF membrane. The loading of the prosthesis was carried out at 1 week post-operative. Here the follow-up over 4 years.

## EXTRACTION IMPLANTATION AND IMMEDIATE LOADING OF THE MAXILLARY WITH VESTIBULAR ALLOGENEIC ONLAY GRAFT



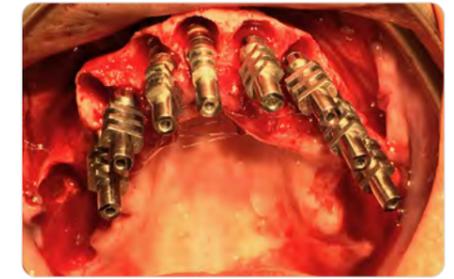
1. View of the first consultation.



2. Follow-up at 4 years: the integration of the prosthesis and the quality of the soft tissues can be appreciated, evidence of perfect stability of the underlying bone reconstruction.



3. Pre-operative panoramic: generalized chronic periodontitis. Associated iatrogenic factors. Angular pockets. Non-compliant/overflowing restorations. Not retainable abutments.



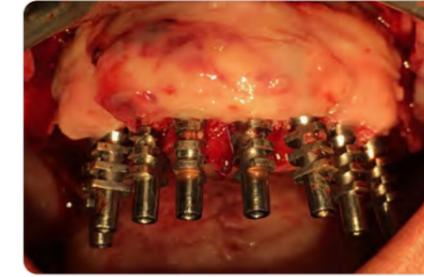
4. Nonguided parallel positioning of the implants in lingual position, in the prosthetic corridor. The vestibular gap will also be easier to fill.



5. Massive vestibular onlay graft, "sticky bone" technique: mixture of BIOBank's allogeneic bone with I-PRF.



6. "Sticky bone": mixture of BIOBank allogeneic cortico-cancellous bone rehydrated with liquid I-PRF. Easy to model and position.



7. Graft covered with PRF membranes.



8. 7 days post-operative healing. Healing caps on conical abutments in place.



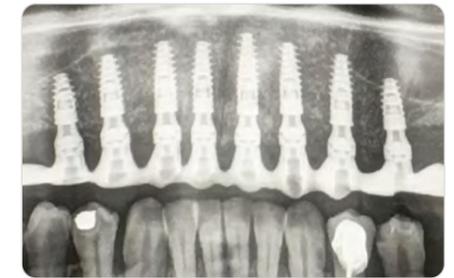
9. 7 days healing, after removal of the healing caps on conical abutments.



10. Occlusal view of the complete screw-retained bridge in place. D+7.



11. Direct vestibular view and view in the mirror of the provisional bridge in place. D+7.



12. Panoramic of the screw-retained provisional bridge in place. Rigid frame. Under occlusion cantilever.



13. D+8 months: removal of the provisional bridge for the printing of the permanent one. Quality of the papillae and the collars reconstituted can be noticed, supported by reconstructed bone peaks thanks to BIOBank's allogeneic graft.



14. Definitive bridge in place. Zirconium frame, mounting feldspathic for cosmetics.



15. Panoramic view of the definitive bridge in place.



16. Smile of the patient.

## CONCLUSION

We saw the progressive maturation of the tissues during the healing phase and even after the placement of the definitive prosthesis. Good periodontal maintenance is performed by the patient, sine qua none condition of the sustainability of the treatment. The allogeneic bone graft placed on the day of surgery allowed to build bone domes between each buried implant in the sub-crestal position; essential for the development and maintenance of interdental papillae, long-term aesthetic guarantees. On the photo of the follow-up at 4 years, excellent gingival quality can be seen. All these parameters well codified today, allow the reproducibility of this type of reconstruction with the best chance of long-term success.



**Dr. Florian NADAL** (09)

- ▶ Graduated from the Faculty of Toulouse
- ▶ European University Diploma in implantology
- ▶ University Diploma of occlusodontics
- ▶ University Diploma of 3D imaging
- ▶ University Diploma of pre-implant surgery
- ▶ University Diploma in aesthetics
- ▶ President Bioteam Occitanie
- ▶ Private practice in Foix



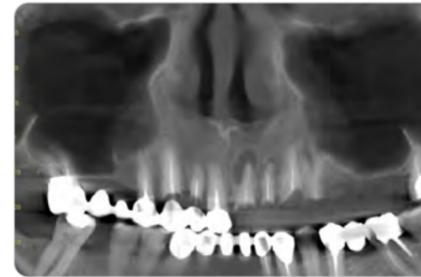
## CLINICAL CASE

A 71-year-old patient has a central fracture of the armature of a ceramo-metallic dento-carried bridge. Because the thickness of the residual crests is insufficient, 2 sinus lifts and allogeneic cortico-cancellous horizontal augmentation grafts are proposed. 6 Zimmer TSV™ implants will be placed to lay a complete screw-retained supra-implant bridge. An overdenture was used for about 12 months which never facilitates healing for allogeneic block grafting.

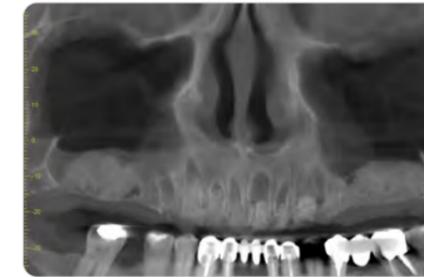
## COMPLETE REHABILITATION IN A CASE OF ADVANCED RESORPTION



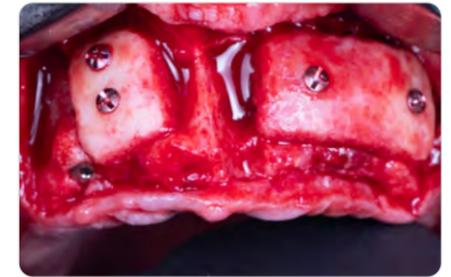
1. Initial intraoral clinical photography with fracture of the complete bridge dento-carried in mesial of the 11.



2. Initial CT scanner panoramic section objectifying to non-conservation of remaining teeth.



3. CT scanner panoramic section after alveolar filling and double sinus lift.



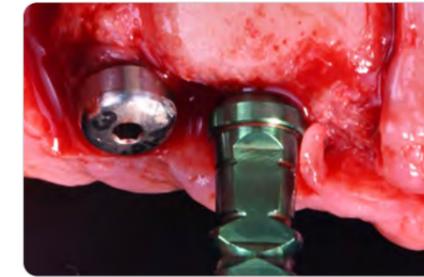
4. Onlay graft from 2 BIOBank's cortico-cancellous bone plates, in agreement with the prosthetic project.



5. Initial CT scanner panoramic section objectifying onlay graft and sinus lifting.



6. Occlusal view objectifying the thickness gain, an implant has been placed in 13 in a healed site.



7. Removal of the osteosynthesis screws and implant placement in the osteointegrated block.



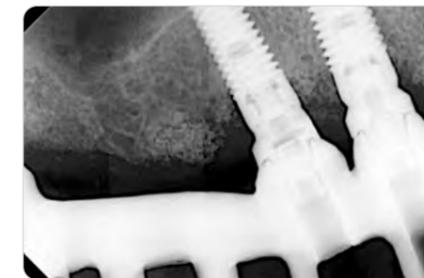
8. Implant placement in sector 2 (TSV™ Zimmer implants 3.7mm x 11.5mm); insertion torque 35N.cm.



9. Implant placement in 12. Note the good vascularization of the block.



10. Installation of conical abutments: Zimmer Biomet. Torque 30N.cm.



11. Control X-rays after installation of the screw-retained definitive bridge.



12. Control X-rays after installation of the screw-retained definitive bridge.



13. 20N.cm screw-retained definitive bridge: titanium + Phonares Vita acrylic teeth (Atelier Dentaire Laboratory).



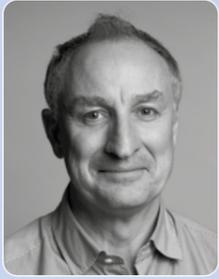
14. Static and dynamic occlusion adjustment before sealing of screw shafts.



15. Smile of the patient at the end of the treatment.

## CONCLUSION

Allogeneic cortico-cancellous bone plate grafts are a good alternative in complex reconstructions. The autogenous bone still represents in literature and "gold standard" habits, but the use of allograft makes it possible not to use a harvesting site for extended graftings. The condition of success is to pay attention to the adaptation of removable prostheses when they cannot be avoided.



**Dr. François POIROUX** (17)

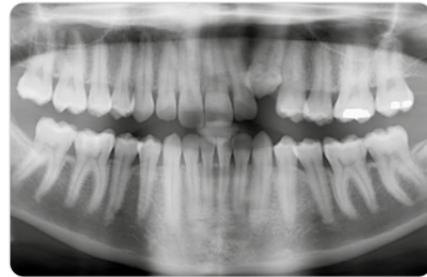
- ▶ Implant placement since 1998, exclusive practice in implantology and periodontology since 2010
- ▶ Graduated from the University of Nantes
- ▶ University Diploma of periodontology, Bordeaux
- ▶ University Diploma of implantology, Bordeaux
- ▶ Diploma of advanced pre and peri-implant surgery, Paris
- ▶ Post-graduate in implantology, NYU
- ▶ Founder of the SPIRE Society of Periodontology and Implantology of La Rochelle
- ▶ Member of the A.F.I.



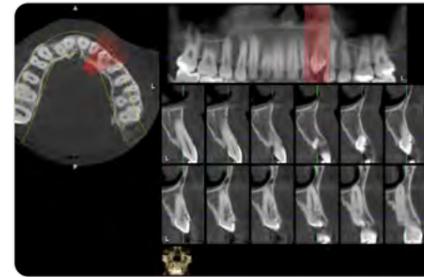
**CLINICAL CASE**

Mrs B. consults me on the recommendation of her dental surgeon for the extraction of the wisdom canine and the placement of an implant in 23. This patient has undergone several orthodontic attempts to pull this canine, without success. Following these failures, she wanted to solve the problem very quickly, namely, extraction and fitting of a conventional bridge on 22 to 24. I managed to convince her to extract this tooth and make a bone filling at the same time as the extraction to save some time. In view of the Cone Beam examination (fig. 2) this seems to be the correct indication. After 4 months of healing, we placed the implant under good conditions, both in terms of quality and bone quantity (fig. 8).

**EXTRACTION OF WISDOM CANINE AND IMMEDIATE FILLING**



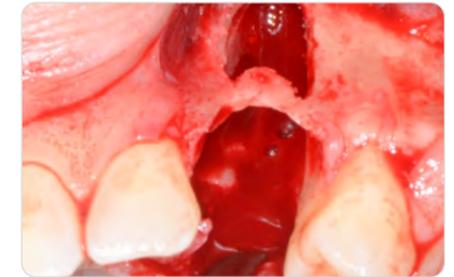
1. Pre-operative panoramic X-ray which shows the relationship of the wisdom 23 with the 22 and 24, October 2019.



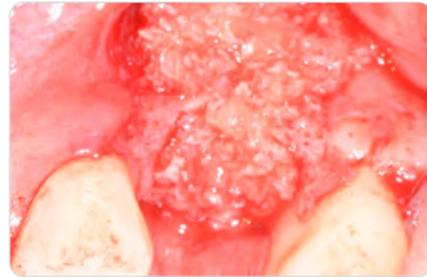
2. Pre-operative Cone Beam images which show in the vestibulo-palatine direction, an onset of vestibular rhyssalys and total ankylosis of the tooth.



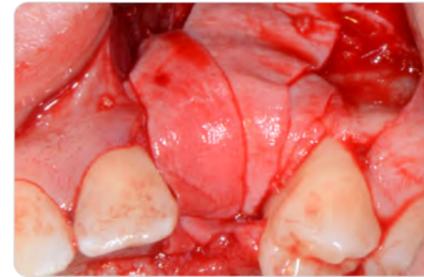
3. Tooth position and tip of the canine apparent.



4. Extraction alveolus with loss of vestibular wall partly due to ankylosis. Cervical bone preservation important for filling and resorbable membrane support.



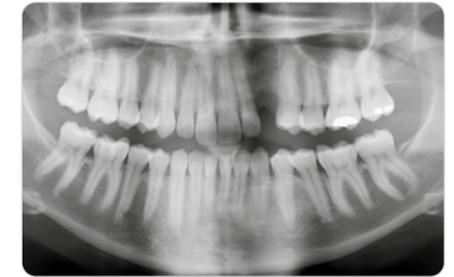
5. Alveola filling with BIOBank cortico-cancellous powder, granulometry 0.5mm, mixed with A-PRF membrane and I-PRF liquid.



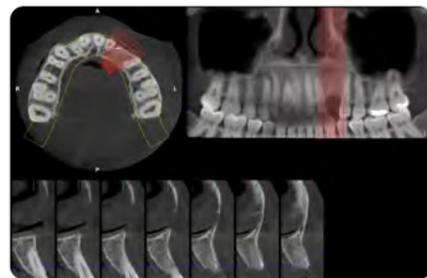
6. Filling covered with Creos™ resorbable membrane (Nobel Biocare).



7. Occlusal view of the re-opening in February 2020.



8. X-ray at re-opening in February 2020.



9. CBCT at re-opening in February 2020



10. Vestibular and palatine gain and no trace of the membrane.



11. Placement of the implant with its healing screw (diameter 5mm and height 4mm) with gingival pedicular conjunctival graft rolled palatine in vestibular.



12. Sutures of the flap as apical mattress to hold the flap despite the movements of the lip and the vestibular and stitches separated in "U" and "O" at the papillae level.



13. Temporary tooth in place for 2 to 6 months.



14. X-ray of implant and temporary tooth in place.

**CONCLUSION**

In conclusion, the patient had to be reassured about this permanent and definitive solution. The solution of the bonded bridge seems to me to be an alternative but, in the long-term, the implant seems better. When the provisional tooth was fitted, the patient was in tears of having a near real tooth, what she no longer believes in. In addition, I was able to place the implant in very good bone conditions, BIOBank's powder allowed us to have a quality bone as good as autogenous. The association of clotting factors with fibrin (PRF), allows me to have a "bone cement" easy to handle, the Creos™ membrane ensures the protection and healing of this filling for 4 months. Difficulty will be on the appearance of mesial and distal papillae. It is necessary to know how to wait long enough with this temporary tooth and work regularly on points of contact. The corresponding dentist is well informed of these steps and will make the final tooth when the patient will be satisfied with the result.



**Dr. Jean-Baptiste REBOUILLAT** (89)

- ▶ Graduated of the Faculty of Dental Surgery of Strasbourg, 2000
- ▶ Thesis topic: Autogenous bone grafts in oral implantology
- ▶ Private practice in periodontology and implantology in Chablis since 2001
- ▶ University Diploma in surgery and implant prosthesis (Lyon), pre and peri-implant surgery (Paris Bicêtre), dental medical expertise (Paris)
- ▶ Author of several articles on bone grafts and implantology
- ▶ Member of the board of directors of the French Association of implantology (AFI)



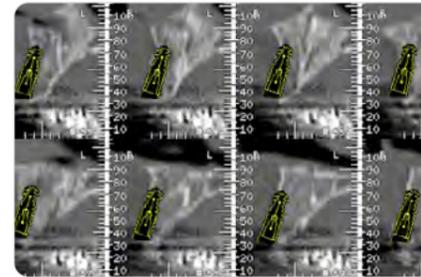
## CLINICAL CASE

54-year-old patient at the first consultation in 2009. Good general health. She has resurgences of deep cavities under a bridge of 13 to 23 with residual roots of 13, 21 and 23. Apical lesions on the 3 non-restorable abutments. After root avulsion and simultaneous filling with 0.5mm powdered allogeneic bone, a 3 months time-delay period is respected. The 3D X-ray exams show a lack of bone thickness to position the implants in the ideal prosthetic corridor. We have therefore, placed the indication of an onlay graft using BIOBank allogeneic grafts in order to avoid a second operating site. After a 4 months healing period, 4 implants are placed in the grafts (13, 11, 21 and 23). A screw-retained definitive bridge, zirconia reinforcement was laid at 3 months. 10 years Cone Beam control shows good stability of the grafted bone volumes around the implants.

## RECONSTRUCTION OF THE ANTERIOR MAXILLA BY TWO BIOBANK ALLOGENEIC GRAFTS: FOLLOW-UP AT 10 YEARS



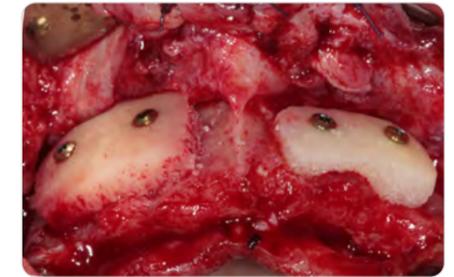
1. Avulsions of residual roots and alveolar fillings with BIOBank 0.5mm.



2. Planning for implants placement on CT scan sections.



3. Clinical view of post-avulsional healing at 3 months.



4. Placement of the 2 cortico-cancellous bone plates.



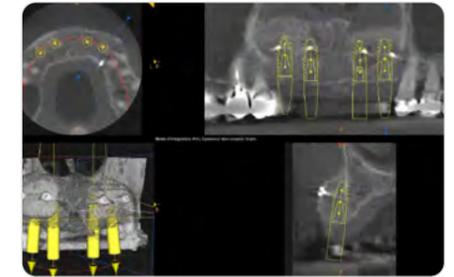
5. Filling of empty spaces with BIOBank bone powder, 0.5mm granulometry.



6. Perfectly sealed closure of the grafted site at 15 days.



7. Clinical view of site healing at 4 months.



8. Cone Beam planning for implant placement and view of grafts integration.



9. Per-operative view during the implants placement.



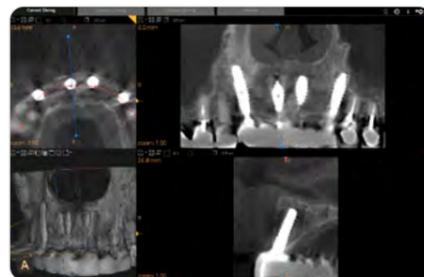
10. Occlusal view of conical connections placed on the implants after osteointegrated.



11. Realization of the definitive ceramic bridge screw-retained, with zirconia reinforcement.



12. 10 years clinical view of the mucous integration of the bridge.



13. Cone Beam control at 10 years showing the stability of the vestibular peri-implant bone.

## CONCLUSION

Allogeneic grafting meet the same requirements as autogenous ones. Their success is strongly conditioned to the good hermeticity of the flaps during the closure of the operative site. It is therefore essential to master the techniques of mucogingival surgery. Through this clinical case, with a significant follow-up, we can see these grafts show a dimensional stability similar to autogenous cortico-cancellous grafts. Their use prevented a second surgical site for the patient, which reduced the surgery time and the risk of iatrogenic lesions.



**Dr. Anne TIBIÉ-BACHELLERIE** (83)

- ▶ Practicing in Hyères les Palmiers
- ▶ Graduated from the Faculty of Medicine of Montpellier
- ▶ University Diploma of forensics expertise
- ▶ Implantology AUI
- ▶ University Diploma of advanced bone surgery



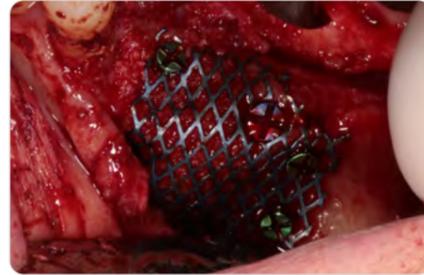
## CLINICAL CASE

The patient consults me to find out if an alternative to a removable denture is possible for her sector 1, knowing that she has a proven lack of bone. After clinical and radiological examinations, I propose an onlay bone graft with BIOBank products and a titanium mesh held by screws, implants placement 4 months after the onlay graft and finally the realization of her prosthesis 3 months after the implants.

## EXTRACTION AND ONLAY GRAFT USING A TITANIUM MESH



1. The 13 to 17 bridge is movable: mobility 4 on 13 and 3 on the remaining abutments. 13 is elongated and at the clinical examination on palpation, a lack of bone appears.



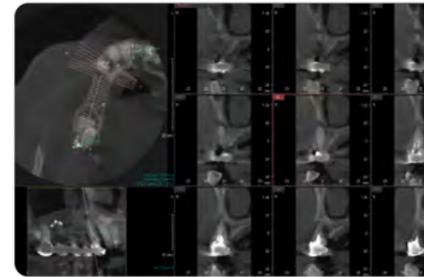
5. For the closure of the flap, incision of half-thickness and apical mattress suture.



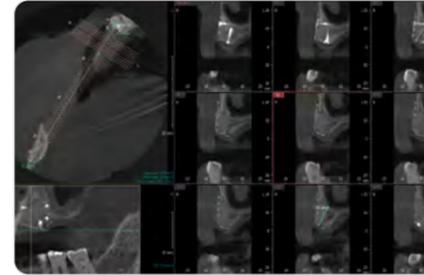
9. At 3 months, the healing is correct, the patient only put her partial removable prosthesis for her social life and did not eat with it.



13. Given that I made a full-thickness flap to remove the titanium mesh, I add some BIOBank's product to prevent potential bone resorption. I also make a flap in half-thickness to make sutures without tension placing mattress stitches suspended with Vicryl 4.0 resorbable suture after also adding 6 A-PRF membranes.



2. Appearance of the bone defect visible in the Cone Beam with granuloma next to 13.



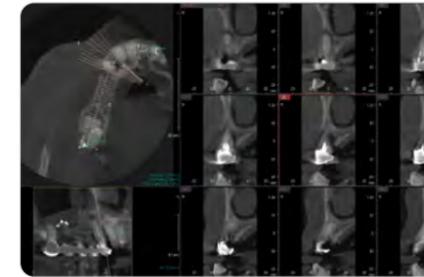
6. Cone Beam 3 months after surgery.



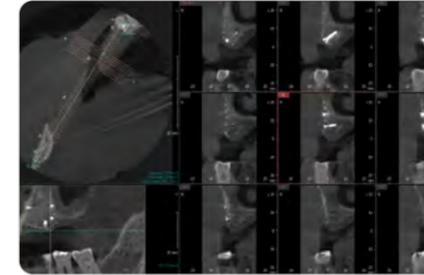
10. Re-opening of flap showing the success of the graft. Removal of the titanium mesh delicately after removing the screws.



14. After a 2 to 3 months post-operative healing phase following the implant placement, we can see the maturation of soft tissues with papillae outline. An optical camera printing will be made to make the definitive prosthesis.



3. Onlay graft is considered before implants can be placed in the prosthetic corridor. It will be carried out with BIOBank allogeneic bone covered by a titanium mesh and A-PRF.



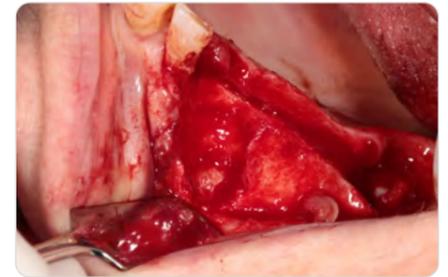
7. Bone gain is observed.



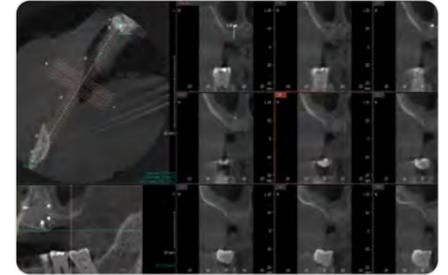
11. At this stage, the observation that we can make is that we find ourselves in the presence of a bleeding bone, so vascularized, this predicts a favourable future for the long-term sustainability of the implants that will be placed.



15. Installation of the implant abutments, then Durlon cement sealing of the prosthesis. Verification and adjustment of the occlusion to prevent certain laterality prematurities that may eventually cause a delayed inflammatory response leading to a peri-implantitis. A maintenance protocol for the implant prosthesis will also be applied to the patient.



4. Para apical anesthesia, then opening of a flap. Atraumatic extraction of 13 followed by curettage. Clinically appearance of the bone defect.



8. It is then possible to place the dental implants in the prosthetic corridor.



12. Then I carry out the first drillings in a bone of medium density, I place my parallelism gauges to correct my implant axes. Then, I place 5 Global D In-Kone® type implants with a low torque since I am in a grafted bone, no more than 20N.cm. I then, put healing caps on my implants.

## CONCLUSION

The realization of an onlay graft by a BIOBank's type allogeneic bone substitute, works well. The holding by a titanium mesh allows to limit the bone resorption by immobilization and the holding of the space between the soft tissues and the BIOBank's product. Even if the autogenous bone remains the "gold standard", the risk/benefit ratio for the patient remains very interesting with very satisfactory bone gain and less intervention.





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