



axiomx3®

Anthogyr
A Straumann Group Brand

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Harnessing innovation for simpler surgery and better bone preservation

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Dr. Gian Battista Greco (page 28).
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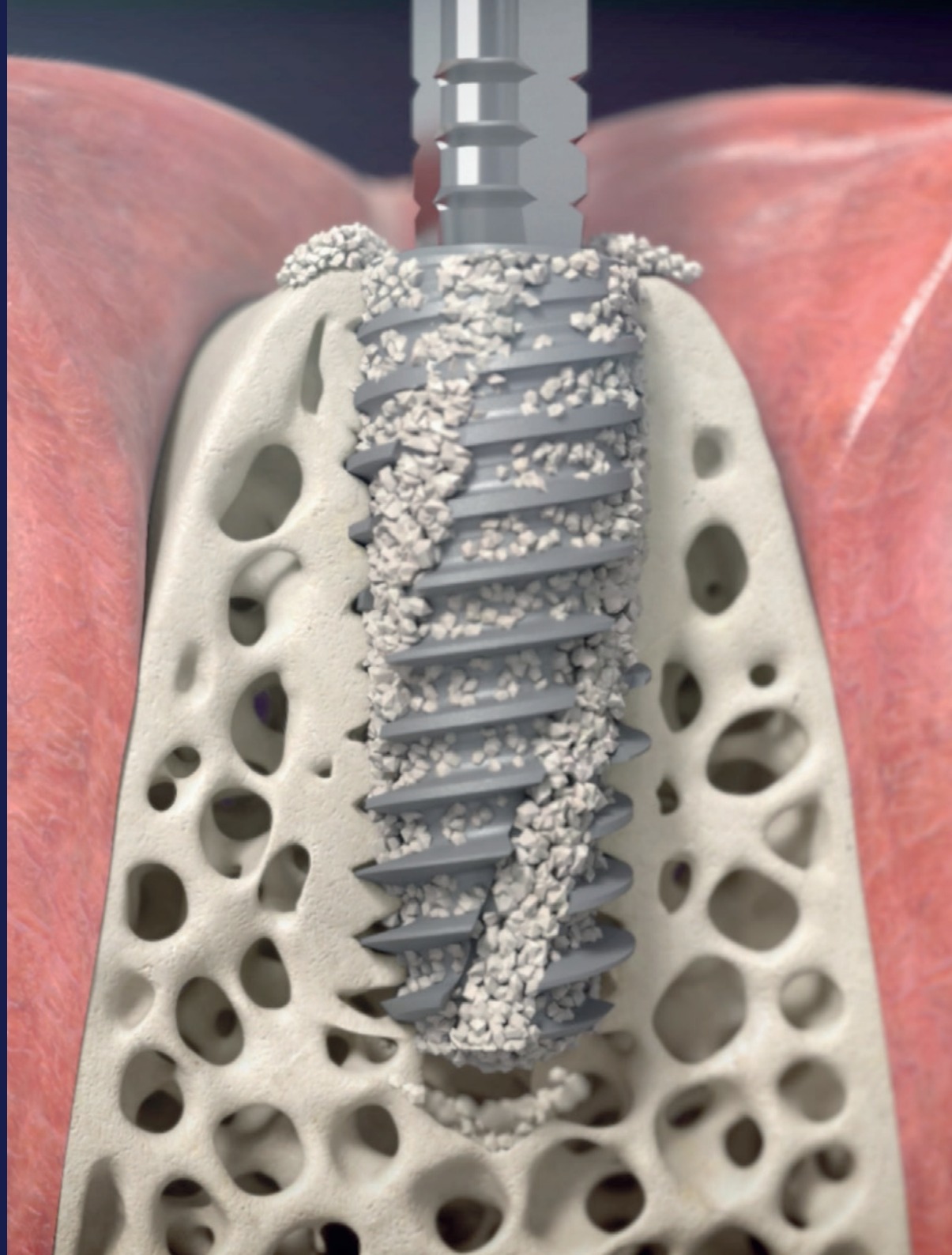
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ACKNOWLEDGMENTS

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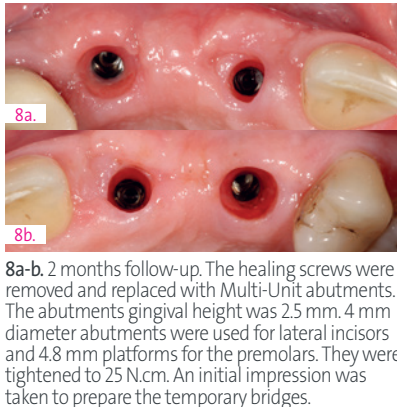
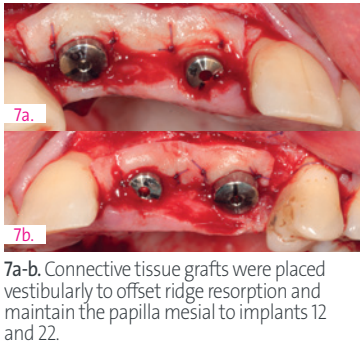
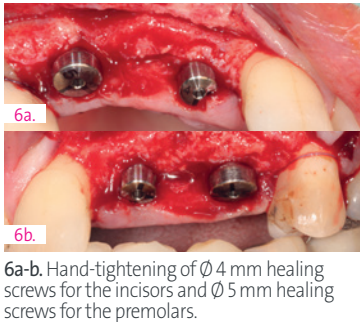
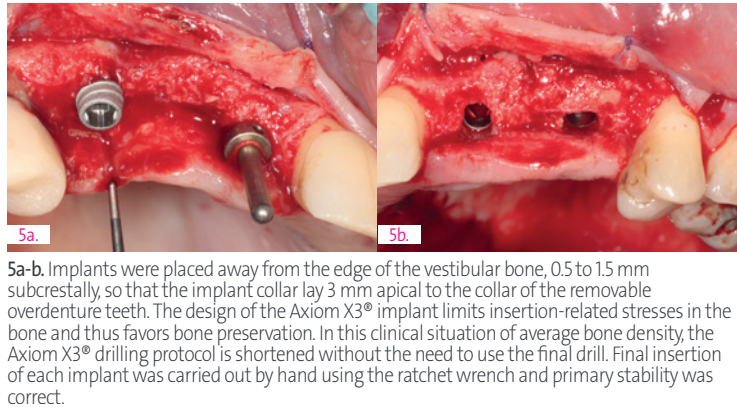
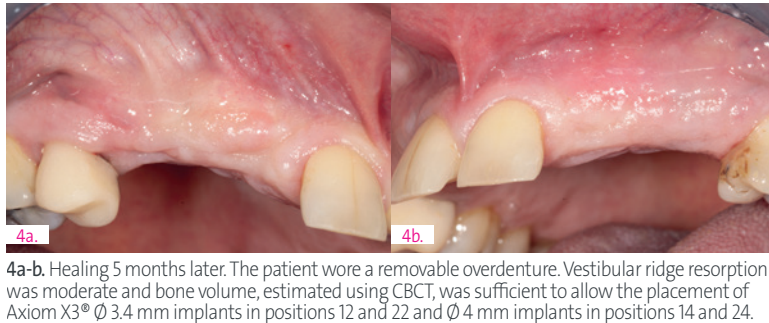
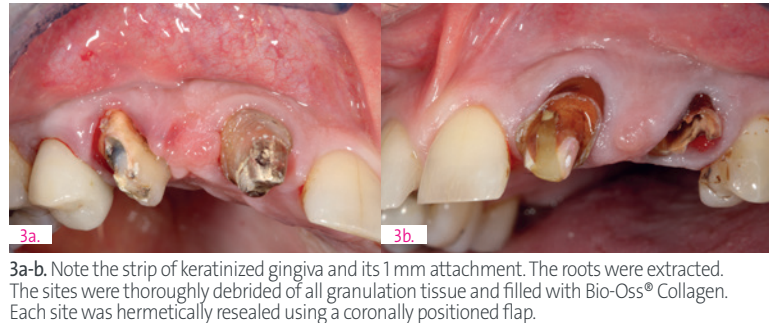
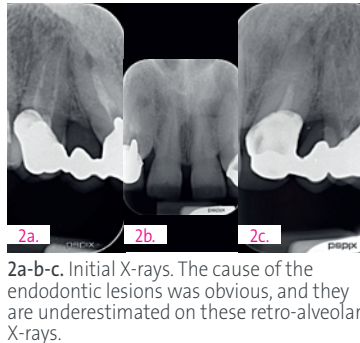
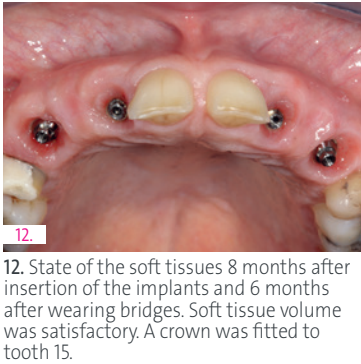
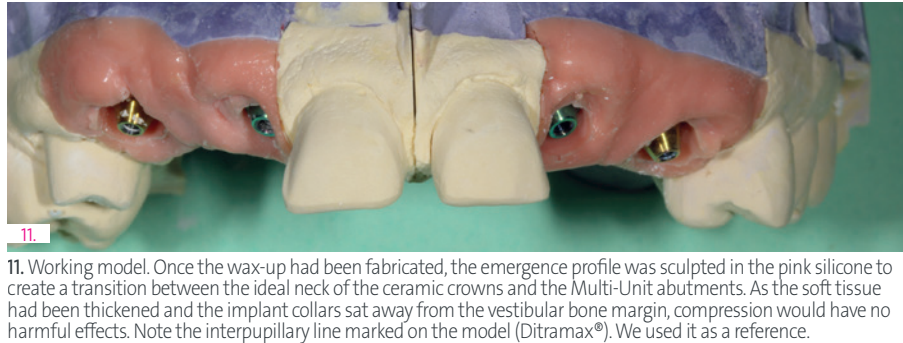
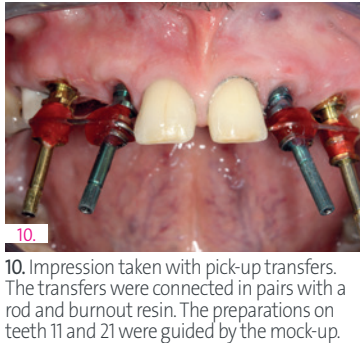
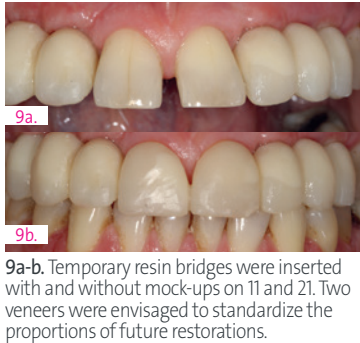
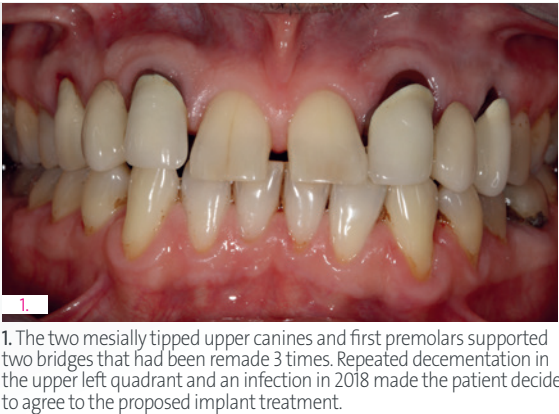


Axiom X3[®] UNIVERSAL BONE ANCHORAGE

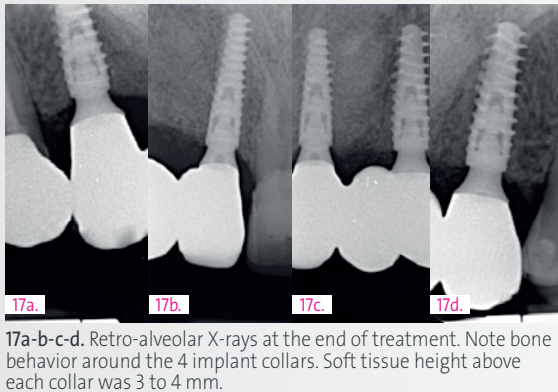


Case report

This 65-year-old patient was a non-smoker in good health. He presented with good periodontal status and a low (or maintained low) smile line. Many restorations had been carried out over time, without affecting occlusal function. There was a natural diastema between teeth 11 and 21. There were also two bridges, created to offset agenesis of the maxillary lateral incisors. The initial consultation was in 2018, following an inflammatory episode of endodontic origin affecting 23 (located in position 22), resolved by antibiotic therapy. At that time, the patient had not agreed to the proposed implant therapy, which was eventually started in 2021 after trust was built up following prolonged treatment in the lower right quadrant.



“ IN THIS SITUATION OF AVERAGE BONE DENSITY, THE AXIOM X3® DRILLING PROTOCOL IS SHORTENED WITHOUT THE NEED TO USE THE FINAL DRILL. FINAL INSERTION OF EACH IMPLANT WAS CARRIED OUT BY HAND USING THE RATCHET WRENCH AND PRIMARY STABILITY WAS CORRECT. ”



Conclusion

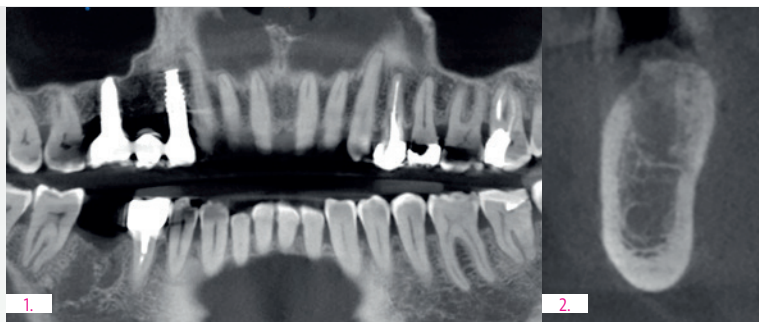
In this simple clinical situation, alveolar ridge preservation and alveolar bone filling made it possible to achieve favorable bone results. Post-extraction vestibular bone loss did not require bone volume augmentation and was offset by palatal connective tissue, which matured over the 6 months following the graft. The drilling sequence for Axiom X3® implants must be adapted to bone density, which is determined using an initial Ø 2 mm drill. In our patient the drilling protocol was adapted to D2-D3 bone, with the final drill being unnecessary. Indeed, the implant's design reduces insertion torque in the bone and favors primary stability. The primary stability that we achieved would have allowed immediate loading of the temporary bridges, thereby shortening the always problematic period of wearing a removable overdenture by 2 months. However, the time required for the ossification of alveolar bone and maturation of soft tissue cannot be shortened.





Case report

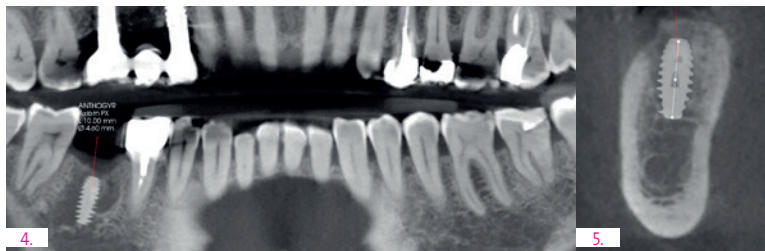
A 53-year-old male patient presented with an absence of the first molar on the fourth quadrant. His overall condition was good – he was a non-smoker, with good oral hygiene. The dental history revealed that he had undergone endodontic treatment about 15 years ago, and had a full contour crown in place, which was causing no issues until pain started and this tooth had to be extracted. It was decided to place an Axiom X3® implant in flapless surgery.



1-2. In trying to analyze, extensive visual clinical inspection was carried out, but these alone was not enough to diagnose the actual bone situation. A 3D X-ray was therefore indicated to assess potential subgingival or bone complications. The images (CS 8200 3D Neo Edition, Carestream Dental, and Metal Artefact Removal tool) demonstrated that bone was still healing with not enough mineralization considering it is as D3 /D4 bone type.



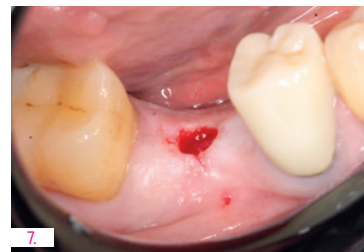
3. Main issues considered after the CBCT evaluation. This combined immediate implant placement with a non-invasive surgical technique facilitates the bone management required to obtain primary stability. An Axiom X3® Ø 4.6 x 10 mm implant was planned and an implant digital X-ray simulation was carried out on the PIDP (Prosthetic Driven Implant Placement) software.



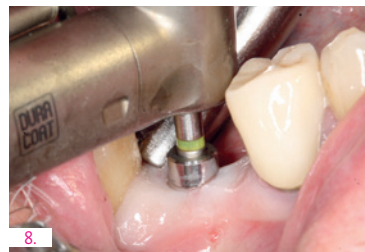
4-5. Radiological implant placement simulation with an Axiom X3® Ø 4.6 x 10 mm implant.



6. Pointer drill.



7. Gingival punch.



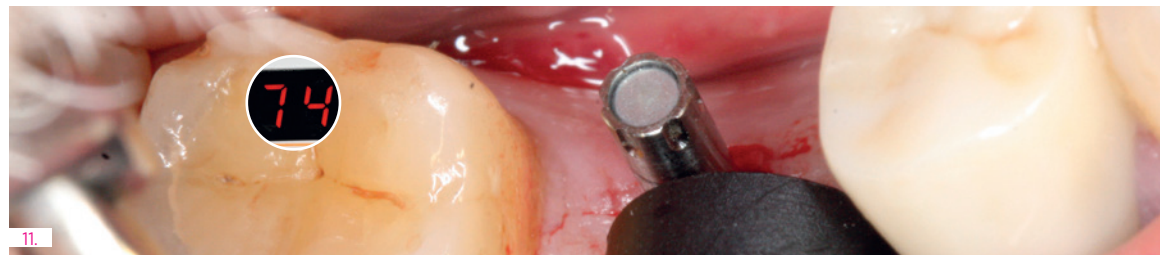
8. The 2 mm diameter pilot drill is used, until 12 mm deep, followed by 2.4/3.0 and finally 3.0/3.6 mm drills.



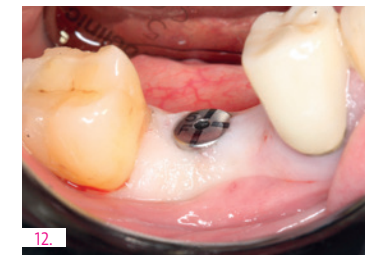
9. No tapping was required and one step under drilling was enough to ensure a high insertion torque of the new Axiom X3® implant.



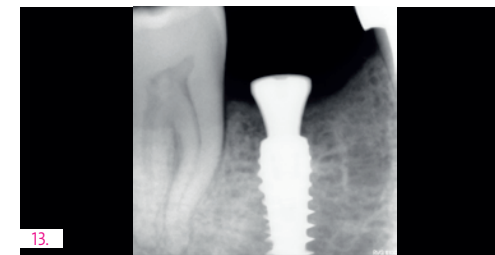
10. Its alternating thread length, bidirectional cutting flutes, tapered profile, slim threads, and self-cutting design really help to achieve this primary stability prerequisite for an optimal osseointegration. The implant was then inserted with the Mont Blanc® contra-angle to its final position in a low-speed mode with the Xpert Unit® surgical motor, ensuring optimal control of the insertion with no tilting of the implant.



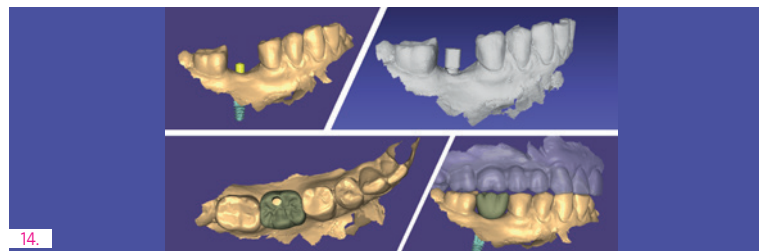
11. Primary stability measurement with a Penguin RFA device resulting on 74 ISQ. The Axiom X3® primary stability is very good, as a result of all mentioned main characteristics of Axiom X3® even in soft bone like in this case.



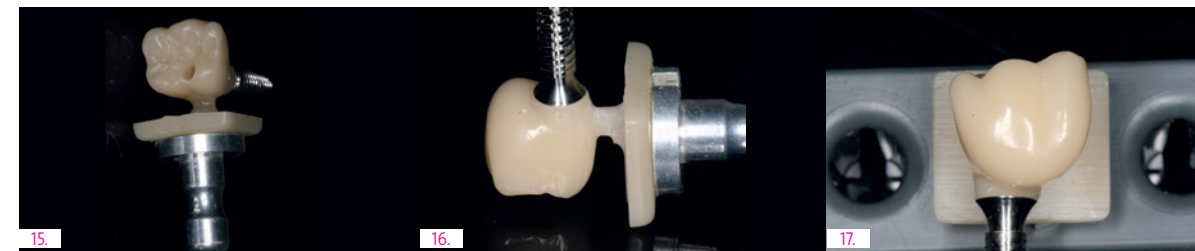
12. A 3 mm height, 5 mm diameter healing abutment was placed on the implant.



13. Intraoral X-ray was carried out confirming a 2 mm subcrestal implant placement as planned.



14. After a healing period of two months the healing abutment was unscrewed to perform a digital impression (Carestream CS3800) using a single unit bone level scanbody (152-27 BL) obtaining a precise STL file that was then exported to a CAD- CAM Software (Exocad). A single crown was designed on a Flexibase® titanium abutment for a cemented chairside restoration made with a VHF milling machine.



15-16-17. A Vita Enamic A3 block was milled. After polishing, the crown was cemented to the Flexibase® abutment with Vita Adiva luting system ensuring no external resin was present on the cementing margins to avoid mucosa irritation. The abutment was screwed at 25 N.cm and the occlusion checked. The oral hygiene rules were reminded to the patient, like roll technique brushing and use of dental floss.

“ **AXIOM X3® ALTERNATING THREAD LENGTHS, BIDIRECTIONAL CUTTING FLUTES, TAPERED PROFILE, SLIM THREADS, AND SELF-CUTTING DESIGN REALLY HELP TO ACHIEVE THIS PRIMARY STABILITY PREREQUISITE FOR AN OPTIMAL OSSEOINTEGRATION.** ”



18. Final crown.



Conclusion

A 6-month recall showed no external changes, the patient was happy, and the case was considered a success. The patient appreciated the quick and precise treatment delivery based on the information obtained. He commented “I’m absolutely impressed by the ability shown by dentist with the implant placement technique, fast and predictable, no sutures were required and finished on three appointments”. Thanks to the new Axiom X3® implant we were confident on every stage of the surgical treatment, reducing the time before implant placement with no risk of implant mobility during surgical procedure. It allowed us to answer the patient request, a non-invasive treatment with fast and reliable results.

Treating agenesis of the maxillary lateral incisors with **Axiom X3®**.

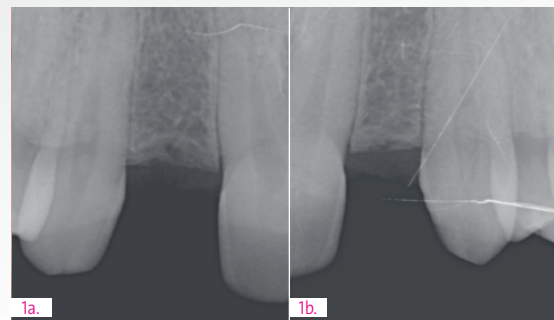
Dr. Eric BLANCHET



Case report

A 28-year-old woman with no prior medical issues presented at our office to have 2 missing maxillary lateral incisors replaced. She had been using a temporary removable denture for many years while waiting for an implant-supported rehabilitation.

The maxillary lateral incisors are, with the mandibular second premolar, the teeth most commonly affected by agenesis. Such agenesis occurs in roughly 2% of the population. The maxillary lateral incisors play both an esthetic and a functional role. The decision to replace them is often complex and arrived at by compromise. Implants are a reliable treatment, although there is a risk of further maxillary growth with a high smile line. Given the patient's native bone anatomy and the proximity of the roots of neighboring teeth, we decided to place 2 narrow Axiom X3® implants, using a surgical guide for pilot drilling. Because the site was healed, we opted against immediate loading. Instead, we delayed loading and took a digital impression during the procedure. This meant that the temporary prostheses would be fabricated before the second-stage surgery. Given the surface angle of the vestibular bone, we chose an AxIN® restoration so that the prostheses could be screw-retained.



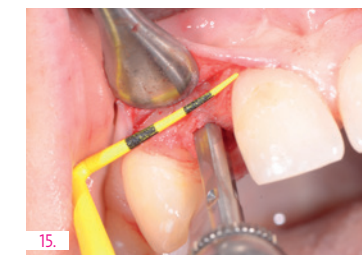
1a-b. Preoperative periapical radiographs showing limited mesiodistal space. 1a - between 21 & 23
1b - between 11 & 13



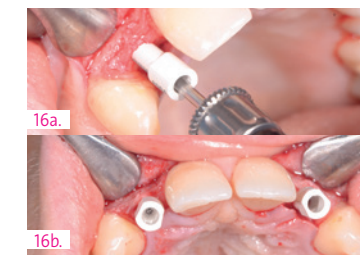
13. Because of the patient's low-density bone, a green drill (diameter 2/2.4 mm) was used for freehand drilling to two-thirds of the osteotomy depth. The Axiom X3® protocol highly recommends undersized drilling in low-density bone.



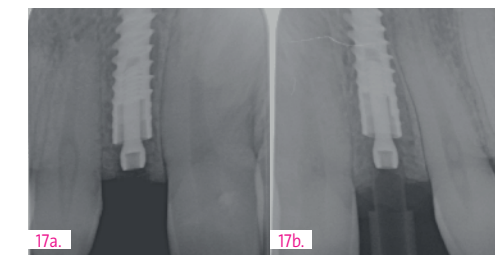
14. Placing the Axiom X3® (3.4 x 12 mm) in position 12. The insertion torque was 25 Ncm.



15. Checking the vertical positioning of the implants. Insertion depth was 3 mm below the cemento-enamel junction of the adjacent teeth.



16a-b. Screwing digital impression copings into place before taking an optical impression to fabricate the temporary prostheses.



17a-b. Radiographic assessment of the implants after inserting the digital copings. Note the ideal implant placement.



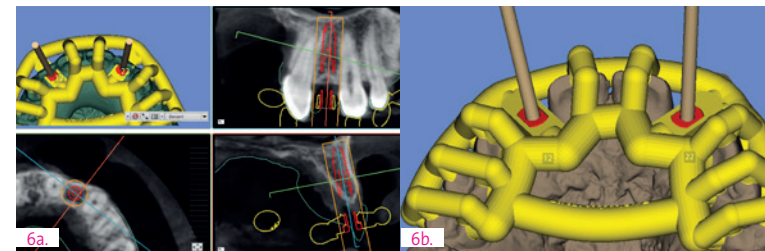
2. Frontal view of patient's initial smile. Notice the high smile line, complicating the case esthetically.
3. Occlusal view showing asymmetrical spaces between 13 & 11 and 21 & 23.



4. Patient's smile with the partial removable denture.



5. Removable denture.



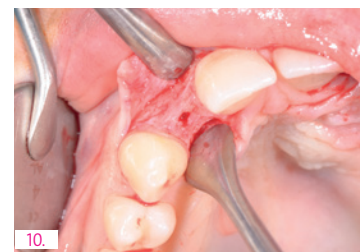
6a-b. Implant planning using the SMOP software package. Implant diameter and length confirmed (3.4 x 12 mm). Vertical positioning chosen to preserve biologic width. Computer-aided design of surgical guide for pilot drilling (Anthogyr). The guide had a tooth-supported design to ensure guide stability and highly predictable implant placement. Computer-aided fabrication based on the 3D impression.



7. Trying-in the surgical guide and checking fit through the openings.



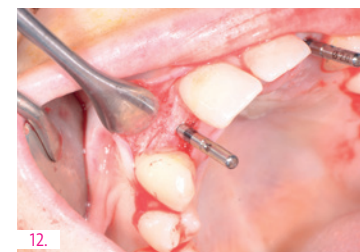
8. Performing the crestal incision and creating a full-thickness flap.
9. Inserting the starter drill. The patient had D3 bone density (Lekholm and Zarb¹).



10. Removing the guide and inspecting the result.



11. Inserting the guided 2 mm drill. Guided pilot drilling ensured precise, controlled drilling.



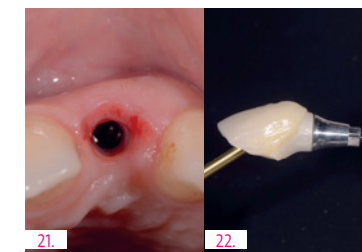
12. Checking parallelism with a 2 mm pin.



18. Occlusal view of the sutures.
19. Healing at 6 months.



20. Implant loading and soft tissue management in the esthetic zone. The emergence profile of the temporary restorations would guide peri-implant soft tissue healing around the teeth.



21. Gingival healing at 3 months.
22. Screw-retained AxIN® crown. Zirconia is the preferred material for the portion contacting the soft tissue due to its biocompatibility. The orientation of the ball wrench illustrates the palatal angulation of the screw channel.



23. Screwing the crowns into place.



24. Occlusal view. With the AxIN® system, we were able to position the narrow screw channel on the palatal side.

“

WITH THE AXIN® SYSTEM, WE WERE ABLE TO POSITION THE NARROW SCREW CHANNEL PALATALLY. ”



25. Final patient smile.



Conclusion

In cases of agenesis of the maxillary lateral incisors, the Axiom X3® implant is a straightforward and reliable alternative to the existing Axiom® REG and PX implant ranges. Given the implant's design, it is vital that practitioners follow the undersized drilling protocol, especially in the maxilla. Its adaptability to multiple clinical indications makes the Axiom X3® particularly useful for managing office inventory.

¹ Lekholm U, Zarb GA. In: Patient selection and preparation. Tissue integrated prostheses: osseointegration in clinical dentistry. Branemark PI, Zarb GA, Albrektsson T, editor. Chicago: Quintessence Publishing Company; 1985. p. 199–209.



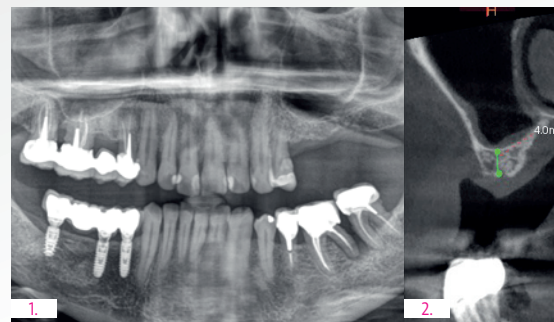
Simultaneous implant-supported prosthetic rehabilitation, sinus lift and bone augmentation.

Dr. Nicolas JUNG & Dr. Frédéric ROGER, together with Denticimes dental lab



Case report

A 60-year-old female patient presented at our office. She was in good health and a non-smoker, and had healthy periodontal tissue and good oral hygiene. Teeth 25, 26, and 27 had been missing for several years, and there was insufficient bone to place implants. However, quadrant four had been the priority, with 3 Axiom® REG implants being placed there in 2019. An inspection of quadrant three revealed significant damage to 36 and misalignment of 37. Therefore, we opted for a shortened dental arch that would replace 25 and 26 but not 27. We decided to perform simultaneous sinus floor augmentation and implant placement, as there was only 4 mm of native bone at the implant sites.

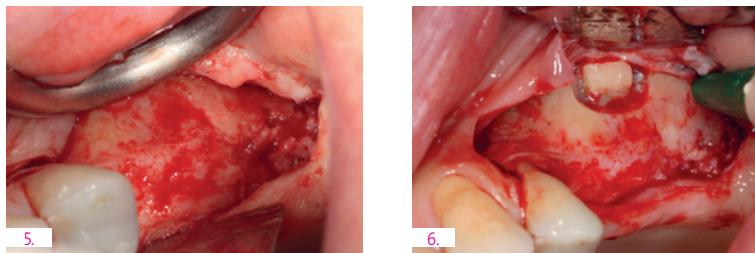


1-2. Panoramic radiography and cone-beam computed tomography showing vertical bone loss. With only 4 mm of sinus floor bone, implant placement was not feasible.

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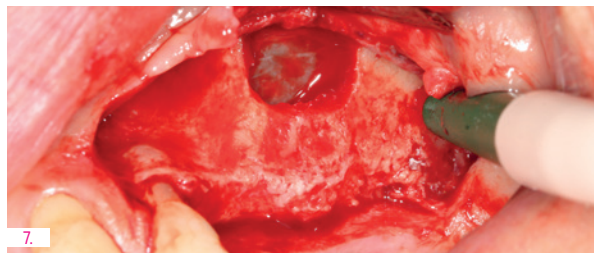


3a-b & 4a-b. Preoperative situation. Free-end saddle. Periodontal tissue appeared healthy. Plenty of keratinized tissue. Notice the more extensive vestibular bone loss around 25.

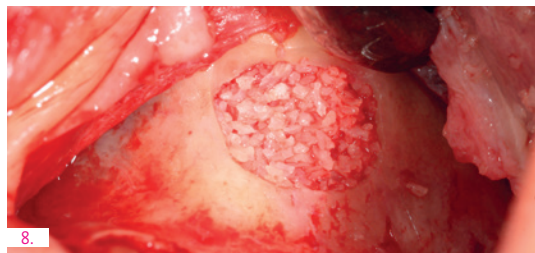


5. A full-thickness flap was elevated and a releasing incision made mesial to 24. Care must be taken at this stage not to damage the periosteum.

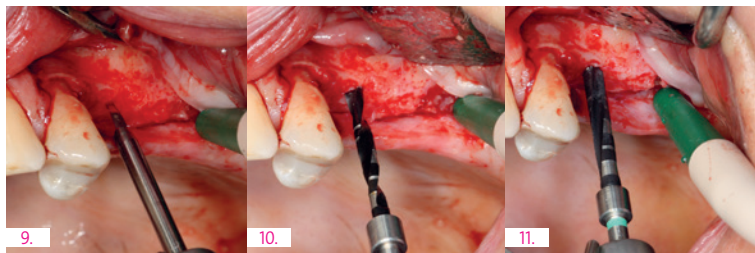
6. A lateral sinus lift was performed by creating a 7 × 5 mm window using a round tungsten carbide bur followed by a diamond bur.



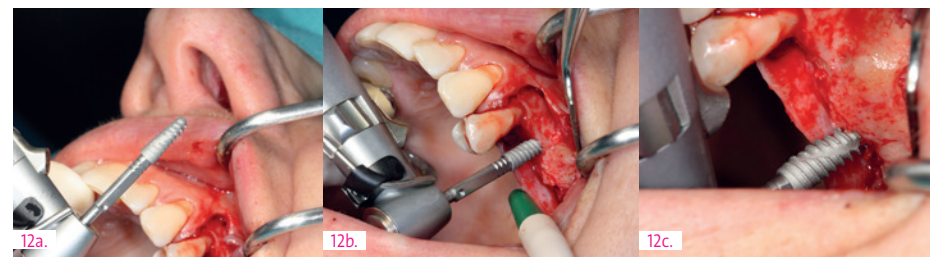
7. The bony window was removed and placed in saline solution so that it could be placed back in position after grafting. The Schneiderian membrane was released without perforation.



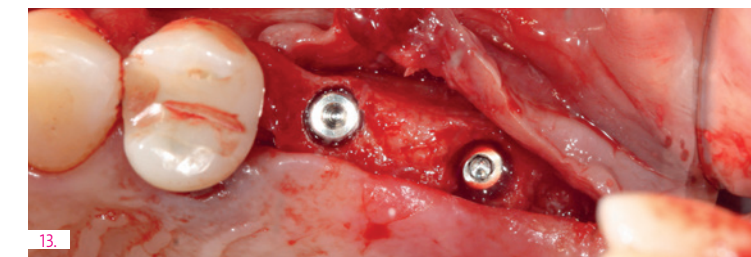
8. The sinus was elevated with cortical/cancellous allograft of a particle size of 0.5 mm and volume of 1.5 cc.



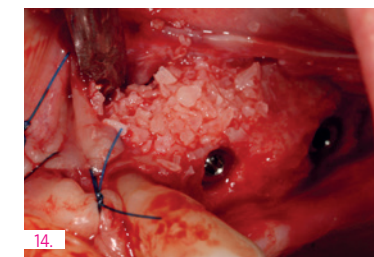
9-10-11. The patient had D3 bone density. Hence an undersized drilling protocol was employed, the final drill diameter being one less than that of the implant. The green drill was used for the 25 implant (diameter 3.4) and the red one for the 26 (diameter 4.0).



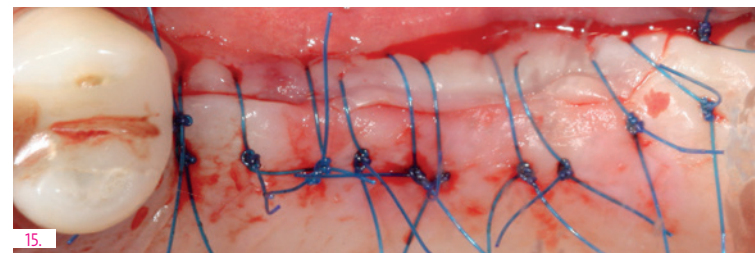
12a-b-c. The design of the Axiom X3® ensures atraumatic implant placement with the micro motor. The Axiom X3® also preserves bone, even if the ridge is thin and resorbed. Despite the meager quantity of vestibular cortical bone, there was no perforation or rupture of the crestal margin.



13. The implants were placed 0.5–1 mm subcrestally. Note the thinness of the vestibular cortical bone at the 25 implant on this occlusal view. Despite this, we achieved perfectly acceptable stability values of 19 and 20 Ncm.



14. Graft material added to the vestibular aspect of 25 to offset the bone loss and ensure long-term implant survival.



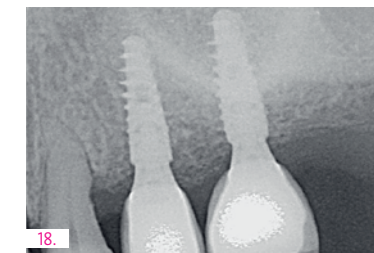
15. The surgical site was closed with 5/0 non-absorbable monofilament polypropylene sutures, removed 10 days postoperatively. The implants were buried with their closure screws.



16. Postoperative panoramic radiograph.



17. Two single-unit zirconia-veneered Simeda® crowns were fabricated on titanium bases.



18. Periapical radiograph after placement of the final prosthesis.

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“THE AXIOM X3® PRESERVES BONE, EVEN IN CASES OF THIN, RESORBED CRESTAL BONE. DESPITE THE MEAGER QUANTITY OF VESTIBULAR CORTICAL BONE, THERE WAS NO PERFORATION OF THE CRESTAL MARGIN.”



19. Final prosthesis in the patient's mouth.



Conclusion

In this case, the Axiom X3® implants gave us better control of insertion into the patient's native bone and ensured good primary stability despite the bone graft. The drilling protocol was adapted to the patient, with the final drill being omitted due to her D3 bone density. The implant's atraumatic apex made placement in the bone graft safe, affording us greater peace of mind in an area where visualization of the surgical field is limited.



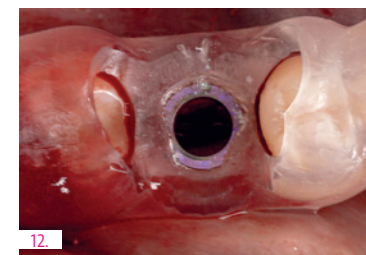


Case report

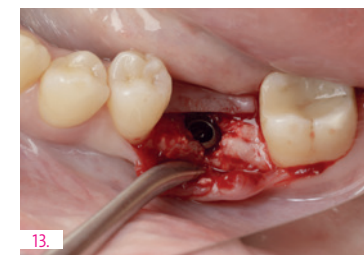
The Axiom X3® implant is a real gamechanger in my office. It preserves more bone and the implant can be used for many clinical indications. In this case a GBR/GTR procedure was performed (Socket Preservation) after extraction. Therefore, the bone situation can be challenging and is usually not a D1 bone situation. The under-drilling protocols and the option to have an implant for all clinical situations are a real benefit in this case. Due to a high primary stability, we were able to apply an open healing procedure which I personally recommend due to a one-stage surgery procedure.



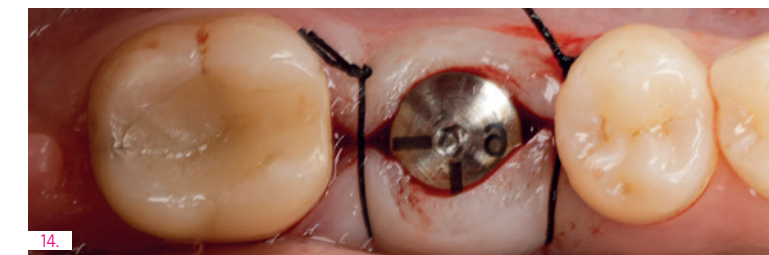
1. Drill guide with 4.2 sleeve based on CBCT (X-ray data) and intra-oral Scan (STL Data) using 3Shape. Merging this data with coDiagnostix to obtain a full-digital-surgical guided using INTEGRAL Guided Surgery 5.0 (sleeve 5.0).



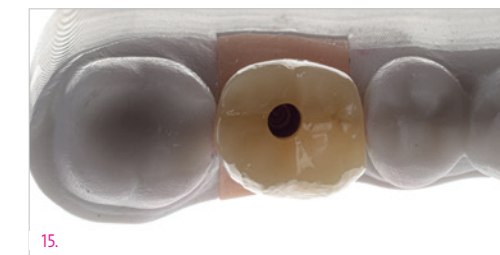
12. Occlusal view: Guide in place with final drilling to show the perfect placement with guided surgery.



13. Lateral view: clinical situation after implant placement.



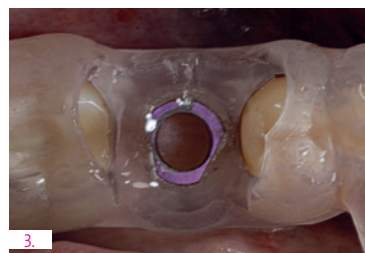
14. Final suturing (suture thread 6-0) with a de-epithelialized flap to thicken the buccal soft tissue; around a standard healing abutment for transgingival open healing.



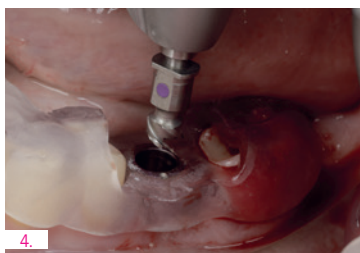
15. Final restoration seated on printed model.



2. Initial clinical situation after GBR/GTR, occlusal view of region 46.



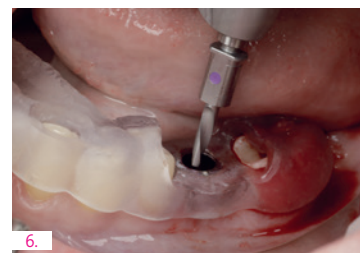
3. Surgical guide in place (region 46), occlusal view.



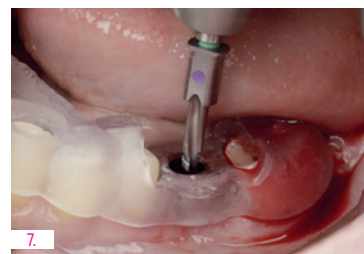
4. Drilling procedure using INTEGRAL guided surgery (5.0Set) - Bone mill drill.



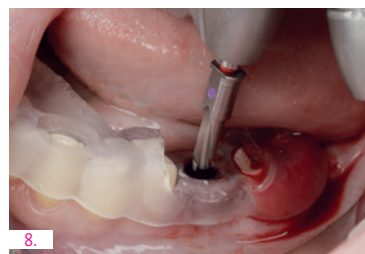
5b. Starter drill.



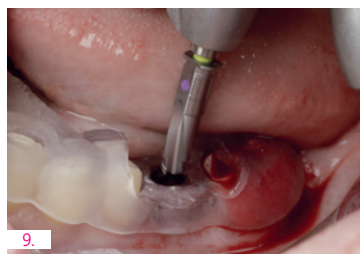
6. Initial drill, L6.5, Ø2.0.



7. Drill L6.5 green, diameter 2.4.



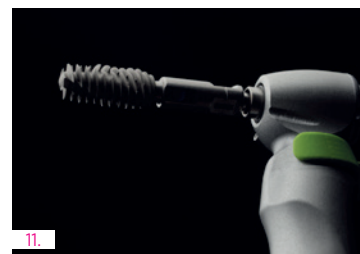
8. Drill L6.5 red, diameter 3.0.



9. Drill L6.5 yellow, diameter 3.6.



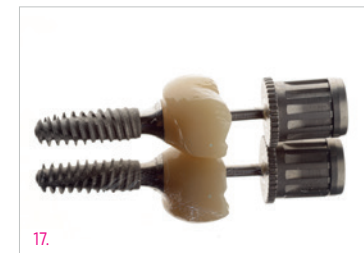
10. Drill L12 yellow for final length, diameter 3.6 for under drilling protocols in a D2 Bone situation.



11. Axiom X3® implant 4.6 12mm



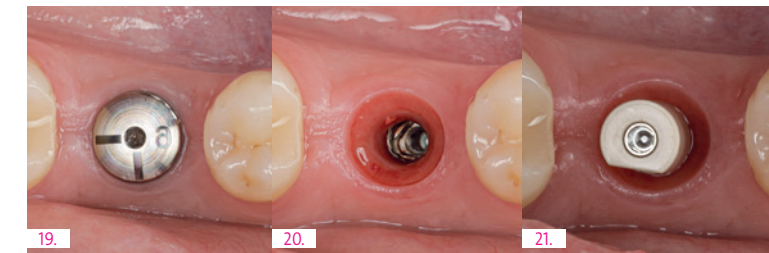
16. Final restoration in comparison of the natural tooth (nature vs. biomimetic implantology).



17. Final restoration with original Axiom X3® and screwdriver.



18. Lateral view after delivering the final screw-retained restoration, a monolithic zirconia crown on a Ti-base (Flexibase® with 5mm diameter, GH 2.5mm and CH 3.5mm).



19. Occlusal view: healed site with healing screw.
20. Occlusal view: emergence profile with Axiom X3® in the socket.
21. Occlusal view: scanbody in place.

“

THE UNDER-DRILLING PROTOCOL AND THE OPTION TO HAVE AN IMPLANT FOR ALL CLINICAL SITUATIONS ARE A REAL BENEFIT IN THIS CASE. ”



22. Final situation with a monolithic screw-retained restoration.



Conclusion

In this case, there was no second surgery needed and the final prosthetics (monolithic restoration on standard Flexibase®, screw-retained) could be delivered right after the healing time. Less invasiveness, less surgery time, less pain, a faster recovery and especially saving hard bone and soft tissue is a real advancement in my daily surgery routine. The Axiom X3® really helps me to deliver better and faster results for my patients and allows me to widen my surgical and prosthetic repertoire for all my patient needs. It is precise, fast and super predictable with less discomfort for the patient. It is the new gold standard in implantology.

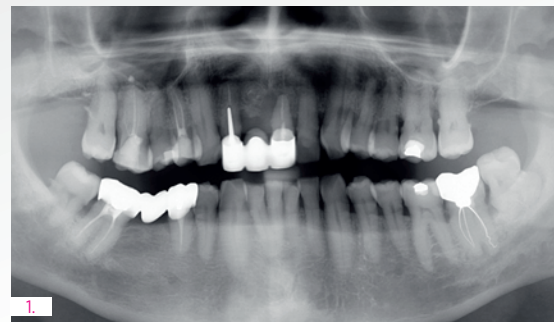


Rehabilitating the anterior zone with preoperative guided bone regeneration and **Axiom X3®**. Dr. Philippe DUBOIS



Case report

A 74-year-old patient presented at our office for rehabilitation of the anterior zone. Despite a great deal of conservative, prosthetic, and periodontal treatment, the patient had significant mobility of the anterior teeth. He could no longer eat or speak correctly. He was being treated for cholesterol, but was otherwise in good health and a non-smoker. This terminal mobility made extraction of teeth 12, 11, 21 and 22 unavoidable. The patient also had chronic, active, generalized periodontal disease.



1. Preoperative panoramic radiograph.

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2. Frontal preoperative photograph showing skewed incisal edges owing to misalignment of the maxillary anterior teeth.



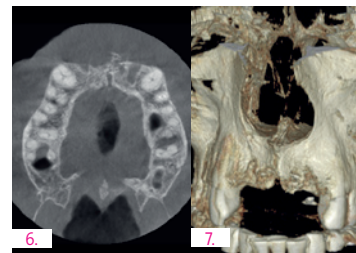
3. Frontal intraoral photograph of the preoperative situation. Notice the extensive plaque and considerable misalignment of the bridge on 11, 21, and 22. Regarding the rest of the dentition, the periodontal disease had to be brought under control. The patient also had to be re-educated in oral hygiene.



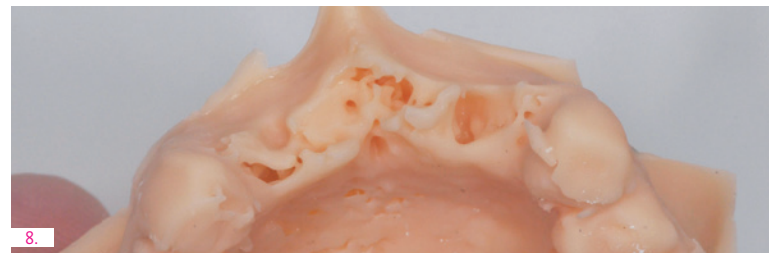
4. Occlusal view post-extraction. Notice the vestibular bone defect. The shape and support of the arch had collapsed. This loss would have to be corrected or, at the very least, managed.



5a-b. Insertion of the temporary removable denture, which had no vestibular support. Being able to visualize the vestibular tissue lost made it possible to picture the volume to be reconstructed.



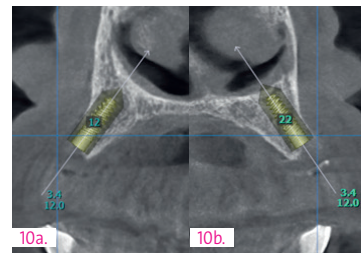
6. Axial radiography of the bone loss caused by different infections.
7. 3D view of the implantation zone.



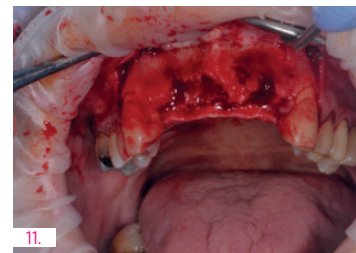
8. A 3D impression was used for visualization and surgical simulation. We decided to perform a preoperative guided bone regeneration. Our aim was to simplify, shorten, and enhance regenerative bone growth. Shortening the duration of a surgical procedure reduces the time tissue is exposed to bacterial ingress and ischemia. The simplified Axiom X3® drilling protocol would save time during surgery.



9. Vestibular view of the preoperative printed model showing a sterilizable model of the barrier membrane that would be used for guided bone regeneration. The model had to be easy to sterilize and cut. In this case, we used a piece of a sterilization pouch.



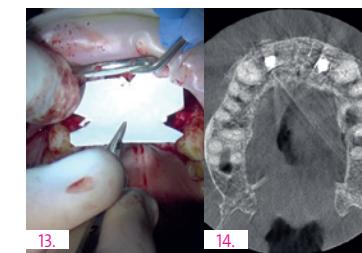
10a-b. Radiographic analysis and planning of implants 12 & 22. The vestibular bone defect at 12 and 22 was noted. The Axiom X3® protocol made for less invasive drilling and placement in bony tissue.



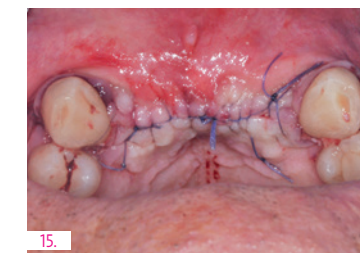
11. Implant site before placement. The initial incision was made down to the bone, along the crest, and into the sulcus of the mesial border of 13 and 23.



12. Insertion of the 22 implant. Only the first drills were used for the osteotomy so as to preserve the vestibular cortical bone. The implant axis was determined by the future prosthesis. The new Axiom X3® implant has a design that facilitates insertion, even in cases of undersized drilling, with the latter improving primary stability. We achieved satisfactory primary stability values of 31 Ncm for 12 and 39 Ncm for 22. As implant insertion preserved some bone on the vestibular side of the implants, vestibular reconstruction was performed immediately.



13. Placing the rigid absorbable barrier membrane that would hold and protect the biomaterial after closure of the mucosal tissue.
14. Postoperative radiography illustrating the gain in tissue volume.



15. Occlusal view immediately after surgery showing the reconstructed tissue volume. Once the final sutures were in place, the removable denture (fig. 6) was placed back in the patient's mouth. This prevented vestibular contact and interference with the reconstructed bone volume.



16. Healing at 4 months postoperatively. Note how the mucogingival junction now lay more crestally. After 4 months of healing, the implants were loaded with Multi-Unit abutments.



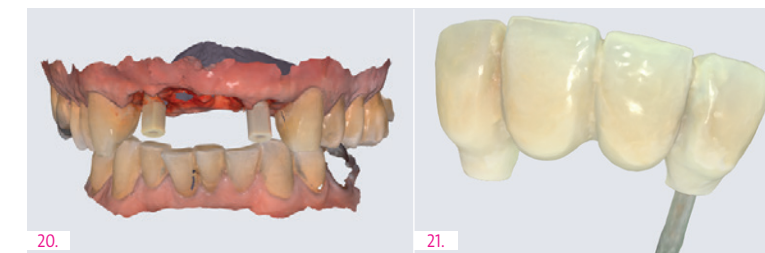
17. Vestibular view of the first version of the screw-retained prosthesis fabricated at this stage of treatment. During this step, the removable denture was adapted for screw retention on the Multi-Unit abutments. This was achieved by attaching Multi-Unit PEEK provisional copings to the removable prosthesis with self-curing resin, thus transforming the removable denture into a screw-retained prosthesis for immediate placement.



18. Using special software, the incisal edges of 12, 11, 21 and 22 were aligned with the interpupillary line. The planned rehabilitation, dimensions, and implant position were superimposed. The overall shape of the teeth was to go from triangular to rectangular to make it easier to recreate the marginal gingiva.



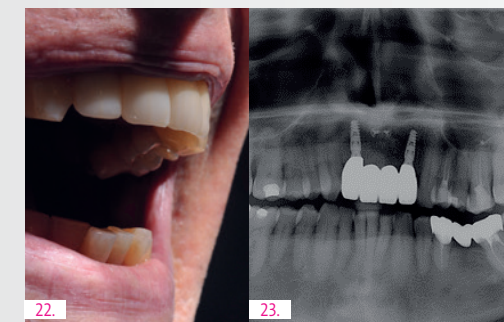
19. Vestibular view of the second version of the temporary prosthesis, used to confirm the planned rehabilitation with the patient. Its dynamic compression of the soft tissues would help create a more natural-looking marginal gingiva for the final rehabilitation.



20. An optical impression was taken once the tissues had stabilized.
21. Impressions of the implants were incorporated into a model of the final rehabilitation. To fabricate a final prosthesis that matched the desired emergence profile, an impression of the second version of the temporary prosthesis was digitally superimposed onto one of the implants. A full-zirconia bridge was fabricated with a slight vestibular cutback to leave space for feldspathic veneering. The subgingival portion was simply polished, whereas the supragingival portion was veneered, stained, and glazed.

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“THE AXIOM X3® PROTOCOL
MADE FOR LESS INVASIVE
DRILLING AND PLACEMENT
IN BONY TISSUE.”



22. Final patient smile, with both gingival and labial support.
23. Final panoramic radiograph.



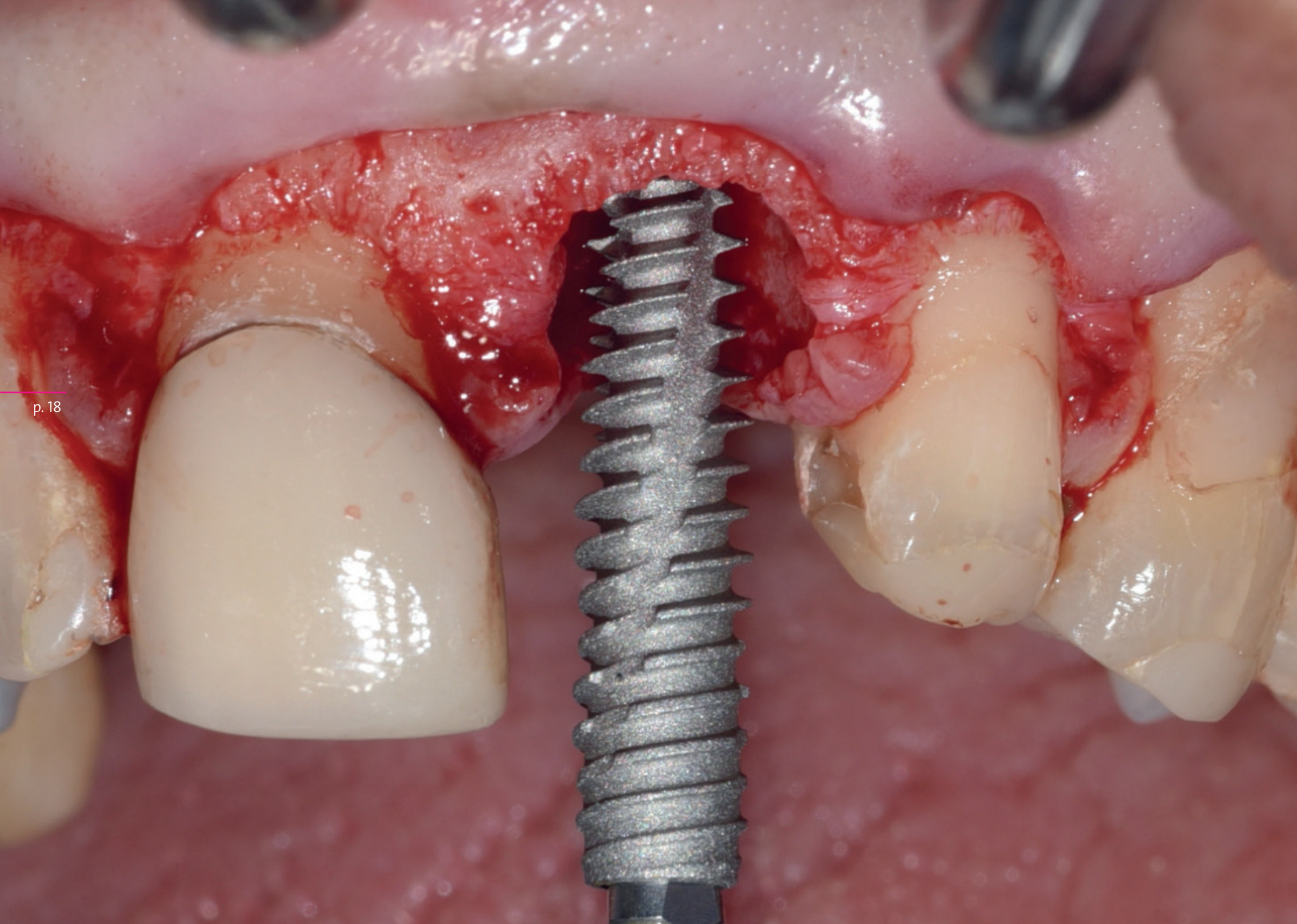
Conclusion

In this clinical case, the design of the new Axiom X3® implant minimized procedure time and bone drilling while preserving a small portion of vestibular bone. Despite its thinness and inevitable loss, this vestibular bone did ensure direct contact between the implant and bone morphogenetic proteins, which are more common in cortical bone. This promoted regrowth of the vestibular bone. The Axiom X3® implants also achieved satisfactory primary stability while minimizing bone stress. Additionally, the compatibility of Axiom X3® with the entire prosthetic range of Axiom® implants meant that we were able to follow our normal clinical protocol.

¹ Wittneben JG, Buser D, Belser UC, Brägger U. Peri-implant soft tissue conditioning with provisional restorations in the esthetic zone: the dynamic compression technique. *Int J Periodontics Restorative Dent.* août 2013;33(4):447-55.

² Kunrath MF, Gupta S, Lorusso F, Scarano A, Noumbissi S. Oral Tissue Interactions and Cellular Response to Zirconia Implant-Prosthetic Components: A Critical Review. *Mater Basel Switz.* 25 mai 021;14(11):2825.





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Axiom X3® SHORT AND IMMEDIATE TREATMENT PROTOCOLS



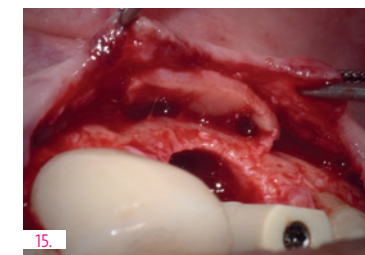


Case report

Patient History: A 55-year-old male patient came to our clinic following a complete coronal fracture of the left upper central incisor. The patient was healthy and did not have systemic diseases; a former smoker, he had lost many posterior elements of the upper arch and needed extensive conservative therapies postponed for economic reasons. The main request was the functional and esthetic restoration of the fractured incisor. **Treatment plan:** after performing an intraoral radiographic examination and a CBCT, a post-extractive implant surgery with immediate loading was proposed. The insertion of an Axiom X3® implant diameter 4 length 16 mm was planned.



1. View of the smile, baseline.
2. Close up, baseline.



15. Connective tissue graft sutured into the buccal flap.



16. Hemocollagen graft to be placed apically into the "jumping-distance".
17. Bone graft (Xenograft Straumann) placed coronally into the "jumping-distance".



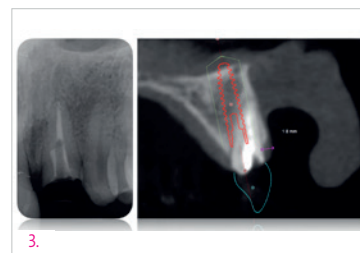
18. Coronally advanced flap sutured with 6/0 absorbable suture.



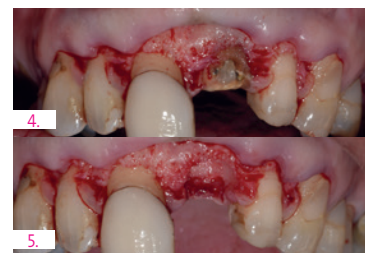
19. Screw-retained provisional crown in-situ (24 hours post-operative).



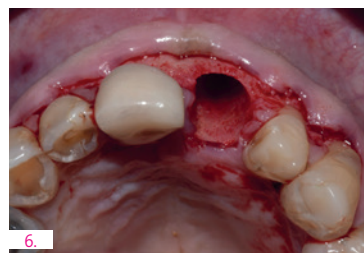
20. Buccal view: 5 months healing post surgery.



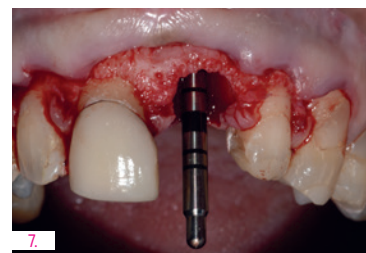
3. Left: Pre-operative apical x-ray. Right: CT cone beam sectional view: digital wax-up and implant planning.



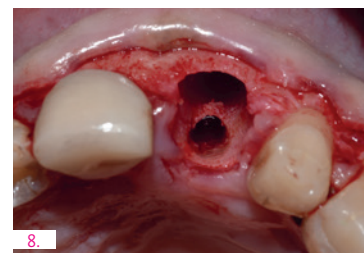
4. The surgery was performed under local anesthesia. Full thickness buccal flap: fractured root #21 in situ.
5. Full thickness buccal flap: root #21 just removed.



6. A full-thickness flap was prepared and elevated from 13 to 23; subsequently the root of the tooth was extracted atraumatically.



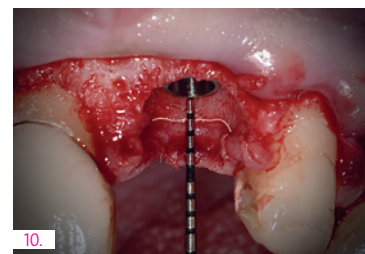
7. Free-hand osteotomy diameter 2 mm.



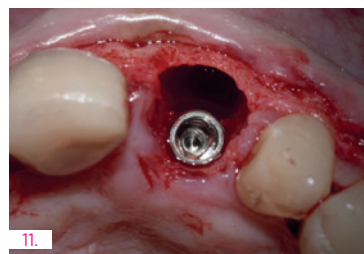
8. Palatal osteotomy was performed in accordance with digital planning; the perceived bone density was D2 and therefore the last drill used was the 2.4/3 mm (red).



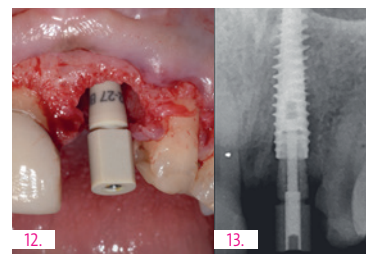
9. Axiom X3® 4 x 16 mm: axis of implant insertion. In this extraction socket, the insertion torque was 45 N.cm, validating an immediate loading procedure.



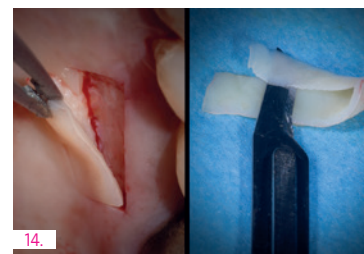
10. Subcrestal implant position (about 1.5 mm)



11. Axiom X3® in-situ: occlusal view.



12. Scan-body connected to the implant.
13. Apical X-ray: scan-body connected to the implant.



14. Left: Epithelial-connective tissue graft taken from the palate.
Right: Removal of epithelial tissue from the graft.

“ IN THIS EXTRACTION SOCKET, THE INSERTION TORQUE WAS 45 N.CM, VALIDATING AN IMMEDIATE LOADING PROCEDURE. ”



26. Smile with the definitive prosthesis.



Conclusion

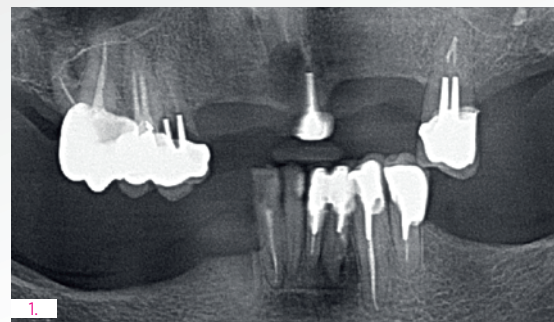
Treatment was satisfactory for both patient and clinician. During the surgical phase, the use of the Axiom X3® implant was very advantageous: thanks to the small size of the implant body, the precise guidance and the cutting efficiency of the threading system, the implant head has reached the expected position without undergoing the classic vestibular displacement induced by the unprepared portion of the palatal bone wall. The reached torque was optimal for the immediate loading procedure.



Case report

This 71-year-old patient was sent to us in early 2019 for a restoration of the upper jaw. We operated her on March 20, 2019, using a technique of full-arch restoration on 4 implants. Satisfied with the functional and esthetic restoration achieved by this first treatment, she consulted us again two years later to perform the same procedure on the lower jaw after losing an important tooth for the stability of her removable overdenture.

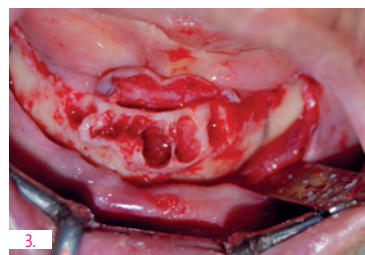
Considering the low bone height above the inferior alveolar nerve, and the more than adequate interforaminal volume, a full-arch restoration on 4 implants was planned.



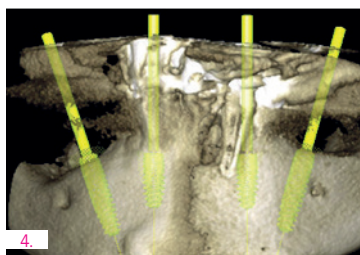
1. Preoperative X-ray.



2. Initial state of the inferior arch.



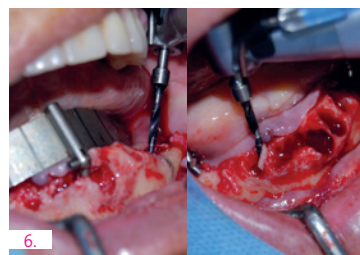
3. After bone extraction and resection, bone debridement and regularization of the ridge to obtain at least 5 mm of width and a flat bone allowing flat healing of the mucosa, facilitating access for the patient's hygiene (no retention of plaque or food).



4. Surgical planning: choice of implants, respect for the symmetry (biomechanics compliant with 3D models of resistance of a full-arch restoration on 4 implants) and estimation of the peak height of the ridge to be resected.



5. The graduated implant axis and symmetry guide (angled drilling guide ref. INGFA) is used to visualize the future arch and the axes of the posterior implants with a distal inclination of 45°.



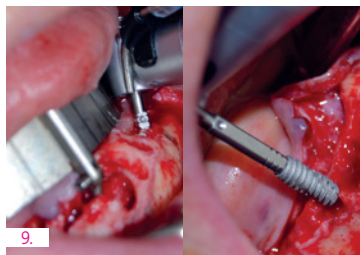
6. Positioning of the pilot drill using the symmetry guide; the gauge is then removed as it interferes with drilling.



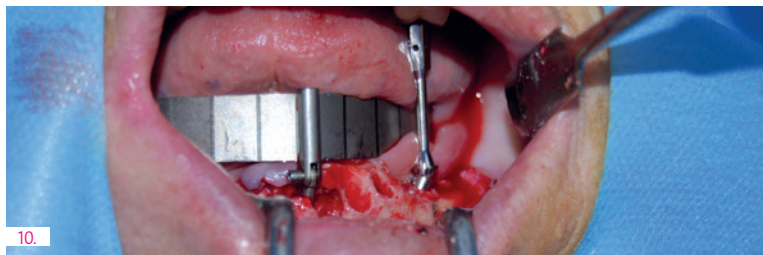
7. In low density bone, the Axiom X3® surgery protocol indicates shortened drilling sequence. Since the surface of the ridge has been decorticated due to the flattening of the arch, a 2.0/2.4 mm drill is sufficient here for the placement of a 4 mm implant.



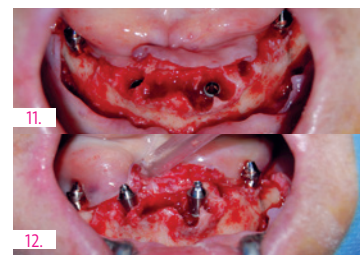
8. Axiom X3® implant with a diameter of 4 mm, length of 16 mm for placement in positions 35 and 45.



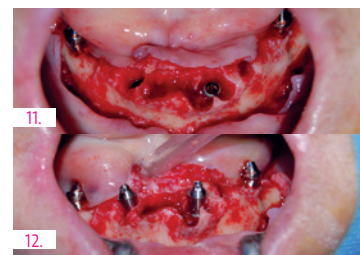
9. Anterior implants in positions 32 and 42. All implants are stabilized at a torque of 35 N.cm. The progressive increase in torque during surgery leads to an ISQ equivalent to that obtained in our usual practice with implants placed at a torque of 50 N.cm.



10. Installation of a Multi-Unit abutment, indexed, with a diameter of 4.8 mm, gingival height 3.5 mm, angled at 30°, allowing for axis adjustment. This abutment remains in place and is unscrewed only if the modification of the surrounding tissues or the aging of the prosthesis requires its replacement by an abutment with a lower gingival height. We chose indexed abutments because, in the event of accidental unscrewing during an inspection, it is easy to find the initial position again.



11. Symmetry and check of the subcrestal position of implants: 0.5 to 1 mm below the ridge.



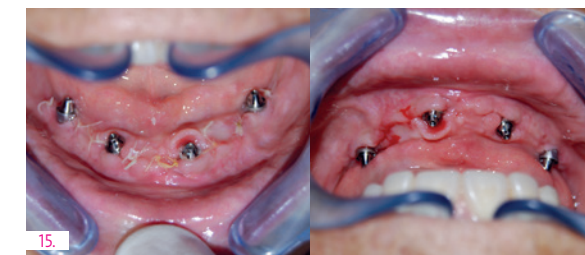
12. Multi-Unit abutments in place before sutures.



13. The impression is taken using the occlusion gauge and a copy of the esthetic project in transparent resin, open in the prosthetic corridor.



14. The height of the temporary abutments corresponds to the height of the extracted teeth and of the bone resected by ridge osteotomy. They will be included in the reinforcement of the immediate prosthesis delivered a few hours later.

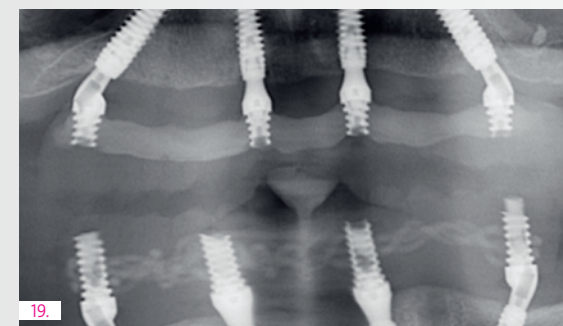


15. Removal of sutures 10 days after surgery and placement of the overdenture the same day. This session makes it possible to recall the principles of masticatory rehabilitation with an adapted diet for 8 weeks, and to check for the absence of contact of the posterior areas of the bridge.



16. In my practice, the immediate overdentures made on the day of surgery will remain in the mouth for at least 18 months, the time to test the new complete function and the proper vertical dimension of occlusion. Thus, after having validated the success of the osseointegration of the implants (about 3 months after surgery), the decision to make the final overdenture will take place after 18 months. At this time, the function, esthetics, resistance of the resin, vertical occlusion dimension, lip support, etc., will be evaluated. If all these parameters are satisfactory, these immediate overdentures can remain in the mouth for another 4 to 5 years before making the final overdentures. This allows many patients to prepare the financing for this second prosthesis.

“THE PROGRESSIVE INCREASE IN TORQUE DURING SURGERY LEADS TO AN ISQ EQUIVALENT TO THAT OBTAINED IN OUR USUAL PRACTICE WITH IMPLANTS PLACED AT A TORQUE OF 50 N.CM.”



19. Postoperative X-ray.



Conclusion

The use of the new Axiom X3® implants, thanks to the adaptability of the protocol, saves time and increases the predictability of the treatment due to the reduction in the number of drills (up to 2 in low-density bone) and the reliability of the primary stability felt here by obtaining an improved ISQ. These advantages should further contribute to the progress of full-arch restorations on 4 implants to enable close to 100% success after 1 year.

Full-mouth rehabilitation with **Axiom X3®**. Simplification of the drilling protocol. Dr. Pierre BRUET



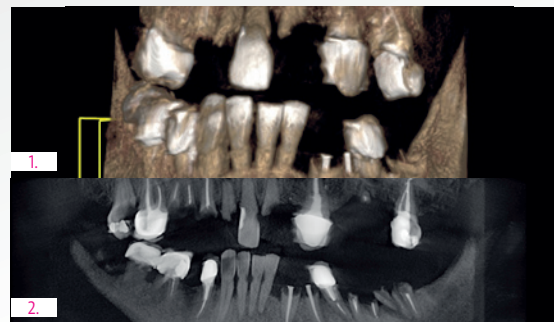
Case report

Mr. V., 56 years old, came for a consultation as he had a complex about his smile and difficulty in eating correctly. The patient was very anxious and had a pronounced dentophobia, which explained the deteriorated condition of his teeth.

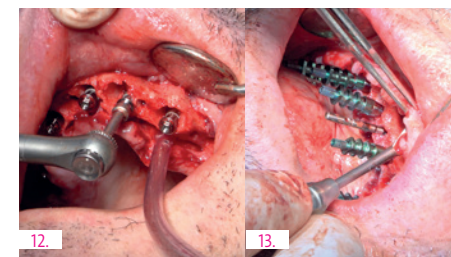
His job involved contact with the public and he had an extremely busy schedule.

After a thorough prosthetic and radiographic evaluation, we proposed an extraction of all teeth under conscious sedation followed by full-mouth implant-borne rehabilitation with immediate loading of 6 maxillary implants and 6 mandibular implants 48 hours after surgery.

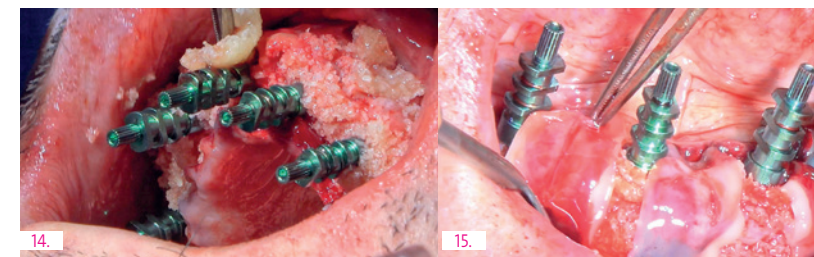
Significant bone reconstruction would be performed simultaneously using sticky bone from allogenic bone. A healing period of 4 months had to be observed before fabricating the final bridges.



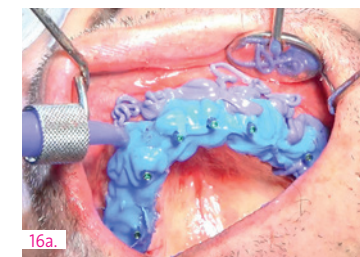
1 - 2. Preoperative 3D scan revealing an extremely degraded clinical situation.



12. Screwing in the narrow Multi-Unit abutments (Ø 4 mm) with a torque of 25 N.cm.
13. Insertion of the pick-up impression transfers for an open-tray impression.



Bone graft comprising allogenic bone mixed with injectable PRF (14.) and PRF membranes (15.) (3 cc of allogenic bone and 6 PRF membranes per arch).



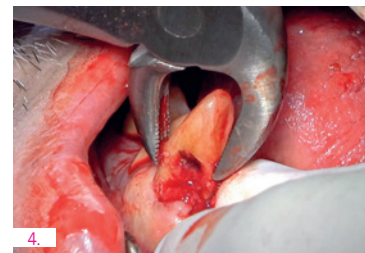
16a. Splinting the pick-up transfers using the bite registration material. This completely locked the transfers into position relative to each other and during casting.



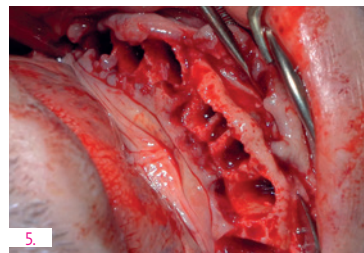
16b. Use of a perforated impression tray.



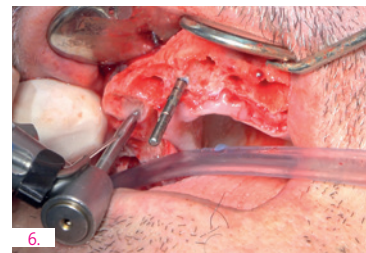
3. Initial clinical situation. Many teeth missing or with only roots remaining. Note the absence of maxillomandibular occlusal stability.



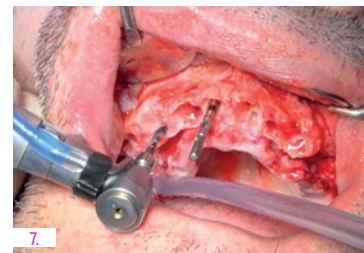
4. Extraction of the remaining teeth. During a full-mouth rehabilitation, we always begin by extracting the mandibular teeth.



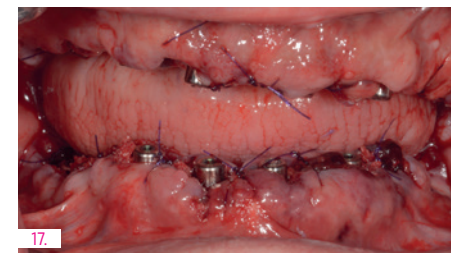
5. The mandibular alveoli were meticulously curetted and disinfected after extraction before performing the initial drilling.



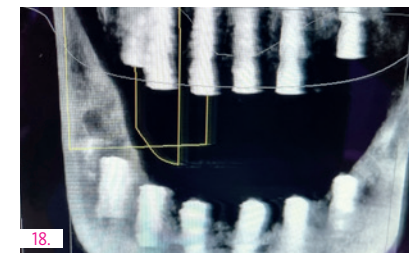
6. Initial central drilling was performed to provide a reference axis to place the 6 implants parallel to each other. Additionally, a surgical guide is always made beforehand.



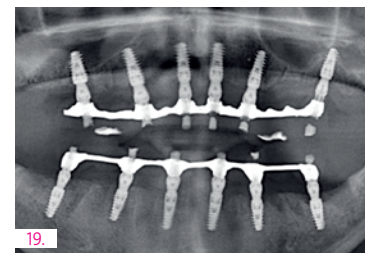
7. The drilling sequence began with the pointer drill, followed by the 2 mm drill, yielding very dense D1 bone.



17. Healing at 48 hours before fitting the temporary bridges. Note the quality of the soft tissues and absence of inflammation. The temporary bridges would be fabricated using a cast framework and resin teeth.



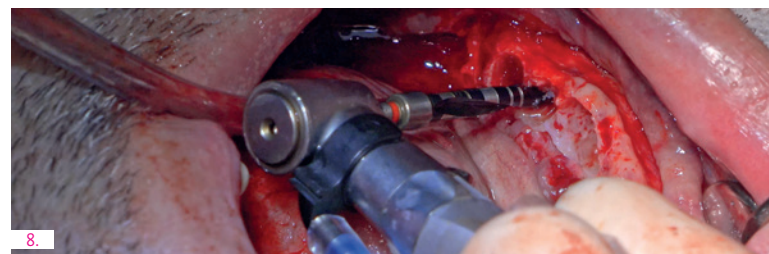
18. Follow-up cone beam scan after surgery.



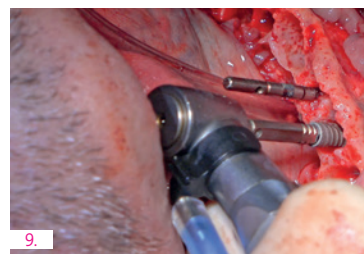
19. Follow-up radiograph after loading.



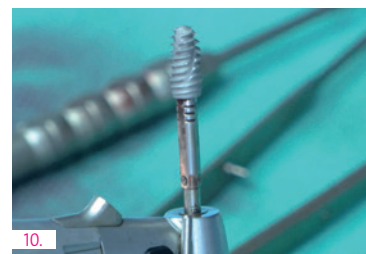
20. Four months after surgery, the temporary bridges had guided the healing of the soft and hard tissues.



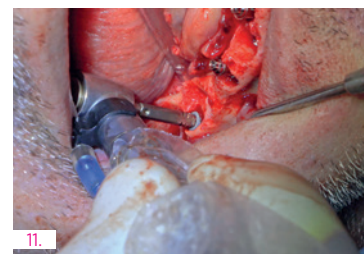
8. For the insertion of this Ø 3.4 mm implant, the Axiom X3® drilling protocol did away with the need for a bone tap despite the presence of D1 bone. The drilling protocol in the maxilla was simpler than in the mandible, as we were dealing with D3 bone. We dispensed with the use of 2 drills that would have been used in an Axiom® REG drilling sequence.



9. The implants screwed in very smoothly without blocking, despite not using a bone tap. Primary implant stability was very satisfactory, with a torque of between 35 and 45 Ncm.



10. The Axiom X3® has special threads and 3 cutting flutes that enable simplified, trouble-free insertion with very satisfactory primary stability.



11. The cutting action of the implant, which allows for progressive stabilization in the mandibular bone, made implant insertion a smooth process.

“

THE AXIOM X3® HAS SPECIAL THREADS AND 3 CUTTING FLUTES THAT ENABLE SIMPLIFIED, TROUBLE-FREE INSERTION WITH VERY SATISFACTORY PRIMARY STABILITY.”



21. Temporary smile met with the patient's complete satisfaction. He rediscovered the joy of being able to smile without embarrassment. He was also able to eat normally.



Conclusion

The case of Mr. V. demonstrated the capacity of Axiom X3® to achieve good stability in bone tissue without damaging it, both in dense and softer bone densities like D1 and D3. The simplified drilling protocol made the use of this implant very convenient and reassuring, particularly in the immediate loading setting. The Axiom X3® implant is an extremely useful implant as it combines bone tissue preservation with the proven benefits of the prosthetic connection of the Axiom® Bone Level range.



Restoring the anterior maxilla: opting for a fixed restoration over conservative therapy.

Dr. Salomé et Dr. Frédéric DIENER, with Laboratoire Pierre et Fils, dental lab in Saint Louis, France

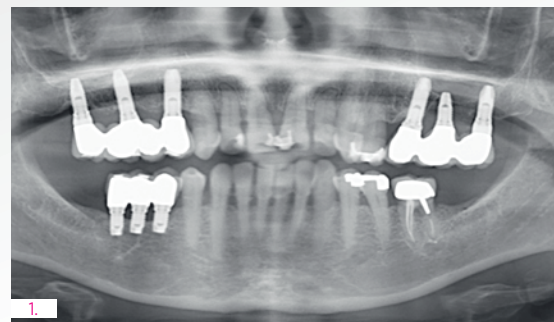
Case report

The patient was a 65-year-old woman. She used to be a big smoker and had received periodontal treatment 12 years previously. During that previous treatment, she had wished to keep her teeth. However, her posterior teeth were lost and had to be replaced by implant-supported crowns. We did not see the patient again for 12 years, with no check-ups performed in the interim. She then presented at our office 12 years later with severe progression of her periodontal disease. She was very self-conscious and had stopped smoking.

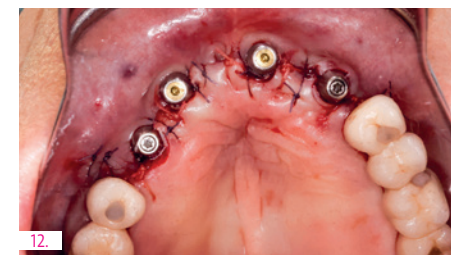
We discussed two treatment options with her: conservative therapy or extraction and immediately loaded implants. The patient chose the more radical, more predictable second option.

Peri-implantitis was diagnosed in quadrant 2 and would be treated in October.

The case work-up made use of all currently available digital technology, from 3D radiography to intraoral scanning, meaning that we were able to plan the treatment with the lab beforehand and take optical impressions.



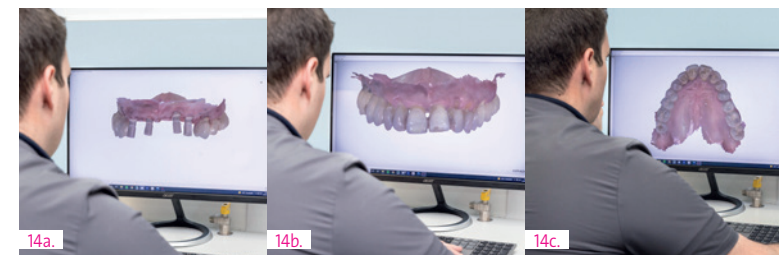
1. Preoperative radiograph.



12. Placing healing caps to support the gingiva during impression-taking.



13. Taking the optical impression.



14a-b-c. Designing the temporary bridge. The initial impression was superimposed onto the implant impression. The temporary bridge served three purposes: esthetic, occlusal, and masticatory. It also aided in promoting lateral excursion.



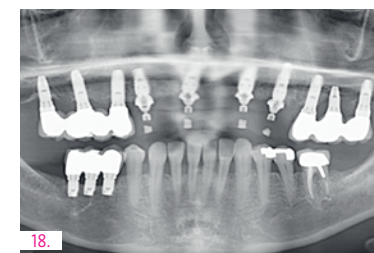
15. A conventional impression was made for verification. Occlusal contact had been restored.



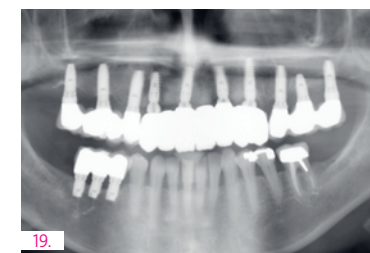
16. Temporary PMMA bridge exactly matching the final rehabilitation. The shape of the teeth was taken from a 3D database (Smile Design).



17. Temporary smile. Even at this stage, the patient was delighted with the result.



18. Postoperative radiograph.



19. Panoramic radiographic check-up 9 months after loading the implants.



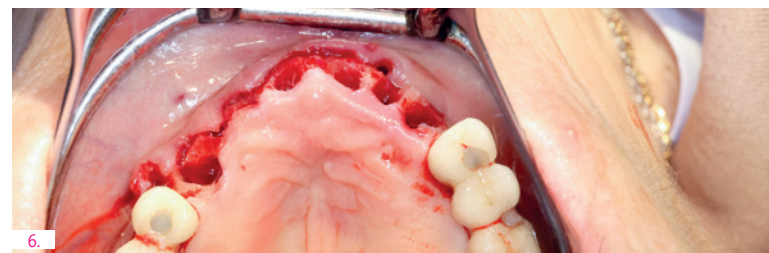
2a-b. Initial situation, showing periodontal disease and vestibular migration of teeth.



3a-b. Neuromuscular recording of the patient's occlusion sent to the lab. Note the asymmetry of the occlusal plane and absence of occlusal contact.



4. Intraoral digital impression.
5. 3D panoramic radiograph.



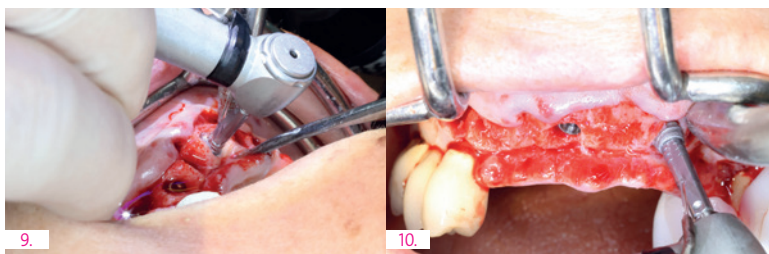
6. Before the procedure, we performed dental prophylaxis to lower the bacterial load in the oral cavity. Antibiotics were administered for the procedure. The remaining natural teeth of the anterior zone were extracted. In the posterior zone can be seen the implant-supported crowns placed 12 years previously.



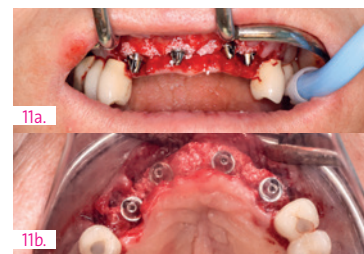
7. The simple, ergonomic Axiom® Multi Level® surgical kit.



8. Computer-based guided surgery was used to align the implant axes with the future prosthesis.



9. Computer-guided drilling into D2/D3 bone.
10. Placement of implants.
Position 13: Axiom X3® Ø4, L10 mm. Insertion torque: 18 Ncm
Position 11: Axiom X3® Ø4, L12 mm. Insertion torque: 49 Ncm
Position 22: Axiom X3® Ø4, L12 mm. Insertion torque: 35 Ncm
Position 24: Axiom X3® Ø4, L14 mm. Insertion torque: 14 Ncm



11a-b. Screwing in the Multi-Unit abutments. Bone grafting was used to create a more harmonious crestal ridge and fill in the gaps between the sockets and implants. A collagen membrane was then placed over the entire area.

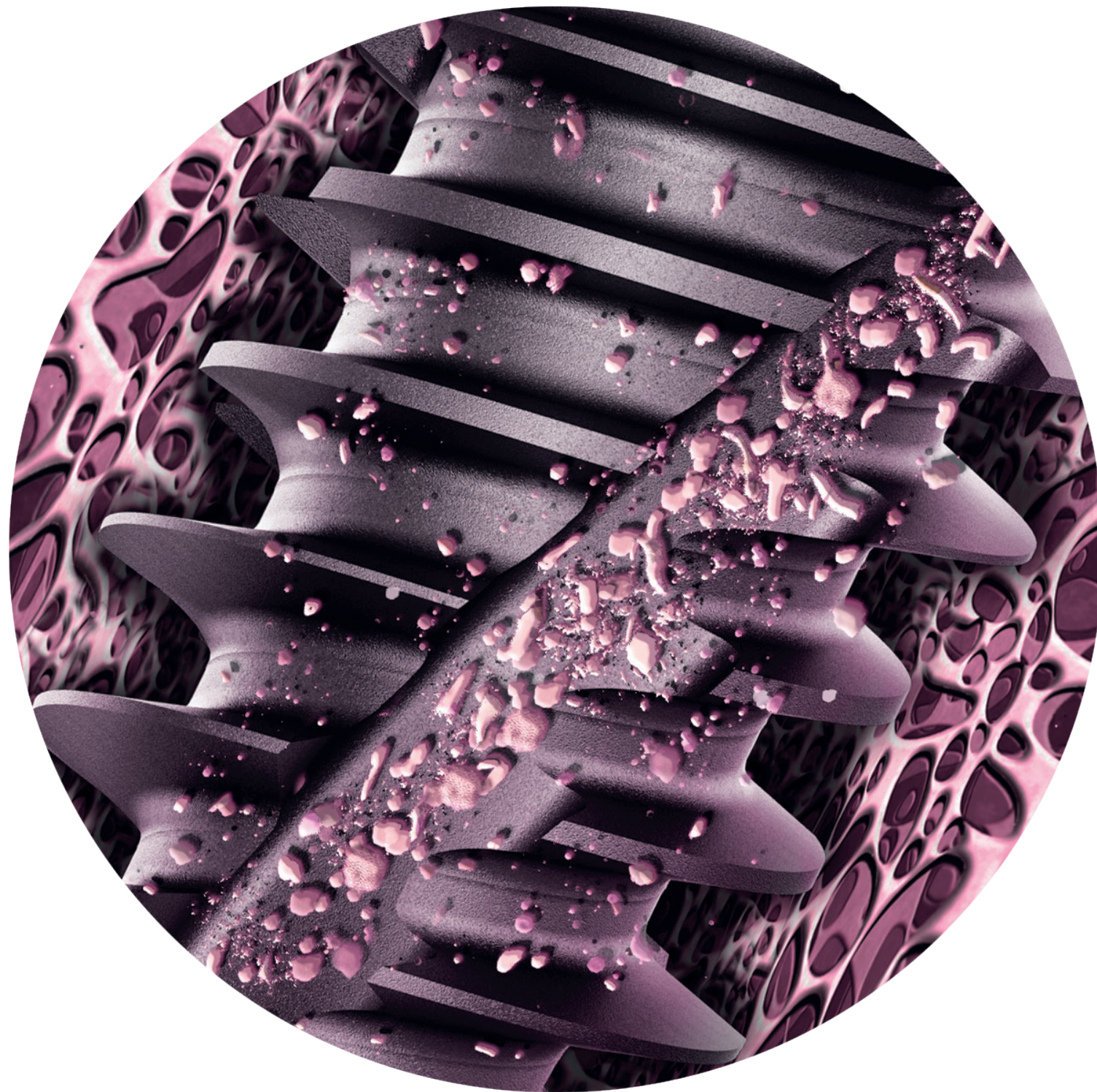
“THE AXIOM X3® IS A PRECISE, HARD-WORKING IMPLANT THAT MAINTAINS THE CORRECT AXIS IN UNDERSIZED DRILLING. IT MAXIMIZES PRIMARY STABILITY IN INTERMEDIATE- AND HIGH-DENSITY BONE.”



20. Final smile 6 months after placing the definitive Simeda® prosthesis. Zirconia framework screwed directly onto the Multi-Unit abutments. The ceramic was made by Alain Pierre Dental Lab. The patient was thrilled with the esthetics and comfort of the prosthesis.

Conclusion

The Axiom X3® is a precise, hard-working implant that maintains the correct axis in undersized drilling. It also maximizes primary stability in intermediate- and high-density bone. This is particularly useful when immediately placing implants after extraction. The insertion torques obtained meant that we could immediately load the four implants. Having a conical connection that worked with the entire Axiom® implant range also greatly facilitated the prosthetic aspects of treatment. Today's digital technology makes multidisciplinary, patient-centered treatment possible. Using it right from the planning stage of the prosthesis and esthetic result improves and facilitates long-term follow-up.



Acknowledgments



ACKNOWLEDGMENTS



Dr. Andreas BENECKE
Germany

- Private practitioner specializing in surgery and implant-supported prostheses, Elmshorn, Germany
- Master's of Science in Dental Prosthetics, University of Greifswald Germany
- National and international speaker
- Teacher of the Year 2012, University Medical Center Hamburg-Eppendorf
- ITI Member



Dr. Eric BLANCHET
France

- Former academic practitioner at a university hospital
- Postgraduate diploma in human biology
- Master's degree in medical and biological modeling
- Diploma in surgery and implant-supported prostheses
- Diploma in dental expert witnessing



Dr. Pierre BRUET
France

- Implant-only practitioner, Moulins
- Postgraduate certificate in biomaterials
- Diploma in surgical and prosthetic implantology, Paris VII University
- Diploma in pre- and peri-implant surgery, Paris XI University



Dr. Damien CARROTTE
France

- Graduate of the Lyon faculty of Odontology (1999)
- Former university hospital practitioner, specializing in fixed prostheses for 4 years at the Lyon faculty of Odontology.
- Postgraduate diploma in human biology, postgraduate certificate in cement-retained prostheses
- Joint diploma in anatomy and oral implantology
- Diploma in maxillofacial and dental expert witnessing



Dr. Philippe COLIN
France

- Private practice, Montpellier
- Hospital practitioner (Nîmes University Hospital)
- Diploma in oral implantology



Dr. Frédéric DIENER
France

- Private practice, Saint Louis
- Graduate of the Strasbourg faculty of dental surgery
- Diploma in implantology, Greater Paris University Hospitals
- Mastership in Dental Implantology Clinical Surgery and Prosthetics (New York)
- Holistic, patient-centered esthetic and surgical care



Dr. Salomé DIENER
France

- Private practice, Bern, Switzerland
- Graduate of the Liège faculty of dentistry, Belgium
- Diploma in oral implantology, Strasbourg faculty of dentistry, France
- Specialized in esthetic and implant-supported rehabilitation



Dr. Philippe DUBOIS
France

- Diploma in surgical and radiological anatomy
- Diploma in implantology
- Postgraduate certificate in biomaterials and dentistry
- CEU in fixed prostheses



Dr. Giuliano FRAGOLA
Spain

- Degree in dentistry, Complutense University of Madrid
- Master's degree in implantology, periodontology, and oral rehabilitation
- ITI fellow and speaker



Dr. Gian Battista GRECO
Italy

- Graduated from Trieste (2000)
- 2007–2008: 2-year master's degree in traditional and implant-supported prostheses with Dr.. Stefano Gracis



Dr. Nicolas JUNG
France

- Graduate of the Lyon faculty
- Practices as an oral surgeon and periodontist only
- Les Aravis dental practice, Annecy



Fabio LEVRATTO
France

- Laboratory in Monaco
- Trainer in Italy (Savona, Brescia, Milan)
- Member of Oral Design Italy



Romain PIERRE
France

- Laboratoire Pierre et Fils dental lab, Saint Louis, France
- Specialized in implantology, esthetics, and digital dentistry.



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