Fernando Rojas-Vizcaya, DDS, MS.
Adjunct Assistant Professor
Department of Prosthodontics
University of North Carolina at Chapel Hill.
Director of Mediterranean Prosthodontic Institute
Castellon, Spain

Angela Capella-Bernat, DT
Mediterranean Prosthodontic Institute
Castellon, Spain

Maciej Załęski, DT
Edyta Cywoniuk, DT
Warsaw, Poland

Mandibular fixed restoration using the Astra Tech Implant System® EV and SmartFix® concept

A 62-year-old male patient with a terminal dentition underwent implant treatment and was restored with a screw retained monolithic zirconia restoration. After full mouth extractions, immediate complete dentures were placed that restored the esthetics and function for the patient. Following 12 weeks of healing, placement of four mandibular implants was planned with Simplant. Aided by the CAD/CAM Simplant guide, four OsseoSpeed EV implants were placed with flapless surgery, tilting the two posterior implants. Multibase Abutments EV 30° were connected to the posterior implants. Immediate loading was applied using the existing prosthesis. A definitive monolithic zirconia[1] prosthesis was made for the Atlantis suprastructure.

1. The patient's initial situation, with removable partial dentures, presented a correct vertical dimension, but an exaggerated inclination of the occlusal plane, creating a non-esthetic smile.

2. In the intraoral examination the reduced interocclusal space and the inclination of the maxillary and mandibular ridges were seen.

3. Panoramic radiographs visualized the inclination of the entire interocclusal space. Two previously placed implants presented signs of peri-implantitis. All remaining teeth showed signs of periodontal disease with a bone loss of more than 50%.

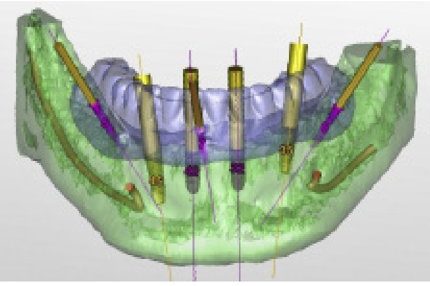
4. Twelve weeks after tooth extraction and explantation of two implants, correct healing was observed with adequate keratinized gingiva.

5. With new provisional complete dentures, the occlusal plane was corrected achieving an adequate smile for the patient, where the maxillary incisal curve was parallel to the lower lip during the smile. The best labial support was also achieved with the anteroposterior position of the maxillary and mandibular teeth.

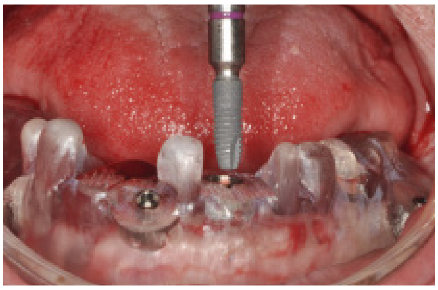
6. For the double scanning technique, dual scan markers were glued on the prosthesis using light curing resin. The patient was scanned wearing the interim complete dentures, then the prosthesis was scanned alone.

1. Rojas-Vizcaya F. Retrospective 2-to 7-year follow-up study of 20 double full-arch implant-supported monolithic zirconia fixed prostheses: Measurements and recommendations for optimaldesign. J Prosthodont. 2018 Jul;27(&):501-508.

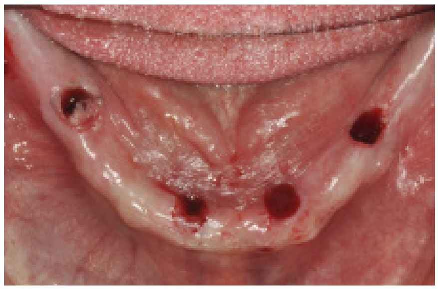
Dentsply Sirona
Implants



7. Four dental implant placements were planned with Simplant using the virtual prosthesis obtained from the double scan. The emergence of the anterior implants were positioned lingually to the prosthetic teeth. The posterior implants were tilted 30° in relation to the anterior implants.

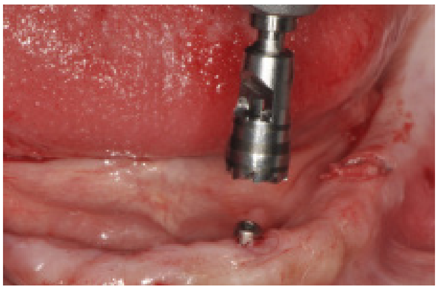


8. The tissue supported Simplant guide was fixed with three micro-screws. Four OsseoSpeed EV implants were placed following the drilling protocol. All implants were torqued to 35 Ncm.

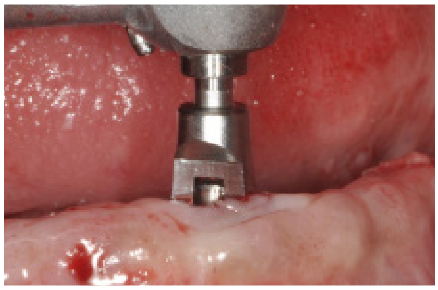


9. After the implants were placed and the Simplant guide removed, very little bleeding was observed around the circular incisions.

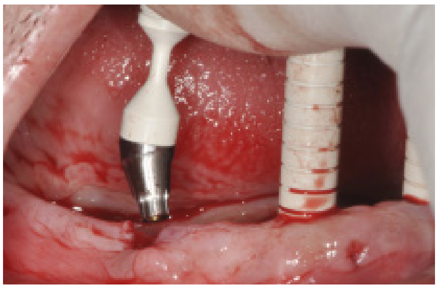
10. Because the implants were placed slightly subcrestal, it was necessary to use the Bone Reamer to ensure correct adjustment of the abutments. For this the corresponding Bone Reamer guide was screwed into the implant.



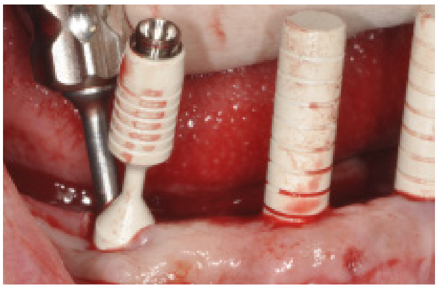
11. A Bone Reamer was used to remove excess bone around the implant contra-angularly.



12. The correct depth of the Bone Reamer was verified ensuring that the Bone Reamer Guide was in contact with the inside of the Bone Reamer.

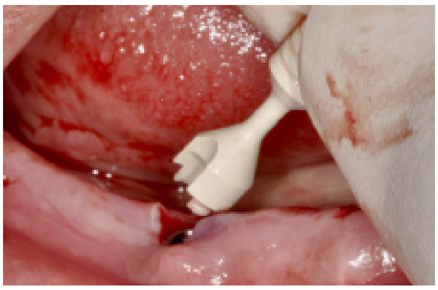


13. Multibase Abutments EV were used for the anterior implants and indexed Multibase Abutments EV 30° were selected for the posterior implants. The abutment body was rotated until achieving parallelism with the abutment holder of the anterior implants.

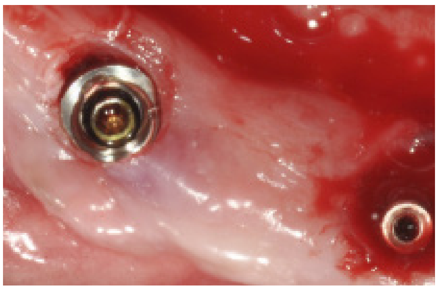


14. Once the desired position of the Multibase Abutment EV was achieved, a manual hexdriver was initially used for installation.

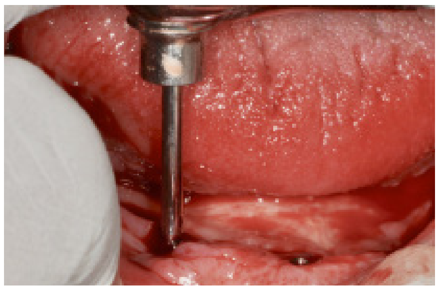
15. Once the two posterior Multibase Abutments EV bodies were placed, the abutment holders were maintained to ensure parallelism between all four abutments.



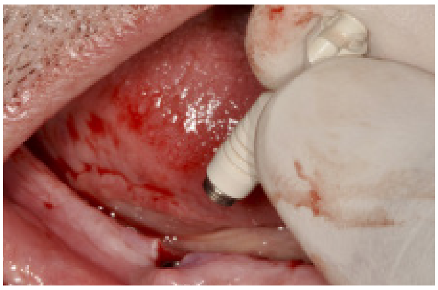
16. Once the positioning of the posterior Multibase Abutments EV bodies was approved, the PEEK abutment holders were unscrewed.



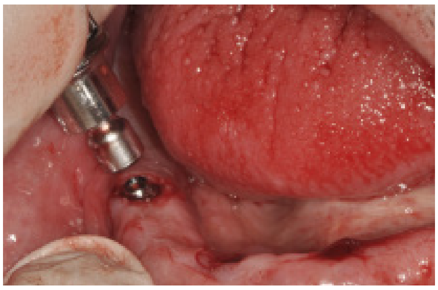
17. When removing the abutment holder, the abutment screw was clearly displayed.



18. Using the Torque Wrench EV and the restorative driver handle together with the hex driver, a torque of 25 Ncm was applied to the abutment screw.



19. Attached on the other end of the abutment holder is the abutment head with a cone taper 21°, which is screwed on the abutment body. The handle is then easily snapped off.



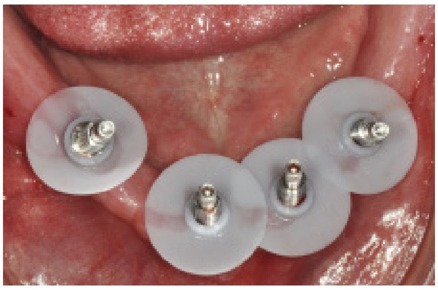
20. The abutment head was initially tightening with the manual Multibase Driver EV.

21. Using the restorative driver handle together with the Multibase Driver EV and the torque wrench to tighten the abutment head to the recommended torque of 25 Ncm.

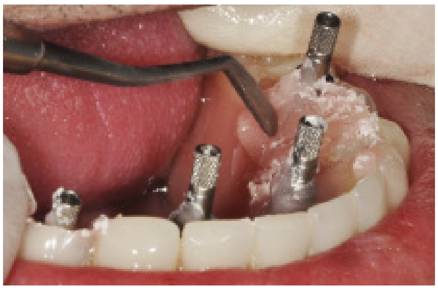
22. In the occlusal view the correct anteroposterior spread and parallelism between the abutments was ensured.

23. Multibase EV Temporary Cylinders were screwed into each abutment manually with a hexagonal screwdriver to verify parallelism. Lab abutment pins were used to avoid excess of fixation material inside of cylinders.

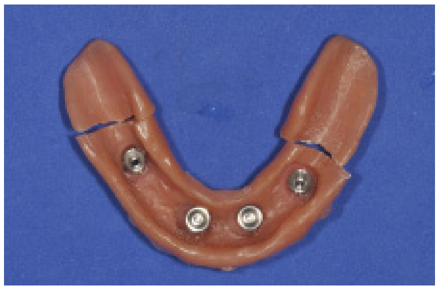
24. The existing prosthesis was perforated until there was no contact between the cylinders and the acrylic, obtaining the same adjustment on the soft tissue and the same occlusion.



25. The Polymerization Sleeve was placed to protect the soft tissue and wound from contamination of fixation material.



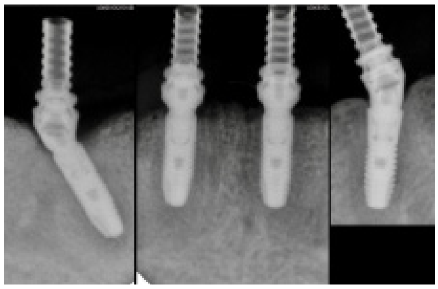
26. Holding the prosthesis in position given by the intact posterior support, acrylic resin was applied around the cylinders. The position of the prosthesis was maintained until the acrylic resin had set.



27. The prosthesis was unscrewed and more acrylic resin was added to completely stabilize the cylinders inside the prosthesis. The distal ends were cut to avoid cantilevers, leaving approximately 5 mm of distal resin to prevent it from breaking when used.

28. The vestibular and distal flanks were cut, without disturbing the prosthesis tissue junction, creating a convex shape that would facilitate the patient's dental hygiene maintenance. The prosthesis was polished, shone and left in chlorhexidine for 15 minutes.

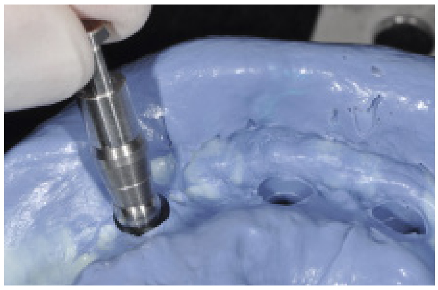
29. The prosthesis was attached to evaluate the occlusion, which was revised until bilateral contacts were established and no interference in excursion movements were found. Prosthesis was removed, polished, and then re-attached using a torque wrench to achieve a torque of 15 Ncm. The screw access holes were filled with Teflon and then covered with silicone.



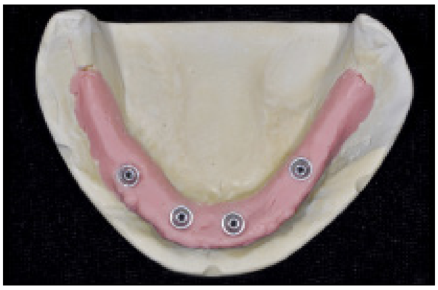
30. The intra-oral radiographs showed correct adaptation between the titanium cylinders and the abutments. They also showed the level of bone around the neck of the implants.

31. After six weeks of osseointegration, the prosthesis was removed and an adequate healing of the soft tissue around the abutments was observed.

32. The final impression was taken using Multibase EV Transfers for closed tray.

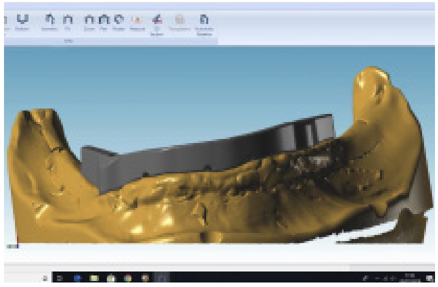


33. The four Multibase EV Transfers were then carefully placed in the impression for the manufacturing of the definitive cast.



34. The silicone used to manufacture the soft tissue of the definitive cast was passed through a laboratory drill to regularize it and remove small irregularities of the soft tissue.

35. Definitive cast was scanned individually, then with the existing prosthesis and finally in occlusion with the antagonist. Then the prototype of the new prosthesis was designed and milled.



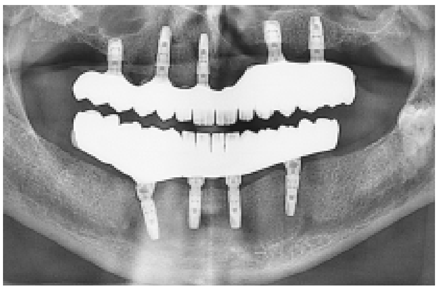
36. The definitive cast and a copy cast of the prototype were sent to the laboratory for the manufacturing of the Atlantis suprastructure. The buccal and lingual walls had an inclination of 4° and the suprastructure touched the soft tissue silicone of the cast.

37. The bar was CAD/CAM manufactured in titanium and between each cylinder small concavities were made to facilitate the passage of dental floss.

38. The passive fit of the bar was evaluated by attaching it in one end and then verifying that it fitted passively in the other three abutments.

39. A new prosthesis was virtually designed keeping the space for the bar. Then the prosthesis was milled in monolithic zirconia and pink feldspathic ceramic was added in the area corresponding to the soft tissue. The bar was glued inside the prosthesis with a dual resin cement.

40. The prototype was replaced by the definitive screw-retained stained zirconia gingiva-colored ceramic implant-supported fixed prosthesis. It was screwed to 15 Ncm with the torque wrench, then the screw access holes were partially filled with Teflon and then with light-curing resin.



41. The panoramic radiograph shows the correct fit of the prosthesis on the abutments and the bone level above the shoulder of the implants.

42. The fixed monolithic zirconia prosthesis was part of the total rehabilitation of the esthetics and function of the patient.

This case report is published as an inspiration for you as a clinician/technician and not necessarily as a recommendation from Dentsply Sirona.

www.dentsplysirona.com

Dentsply Sirona does not waive any right to its trademarks by not using the symbols ® or ™. 32671656-USX-1902 © 2019 Dentsply Sirona. All rights reserved.