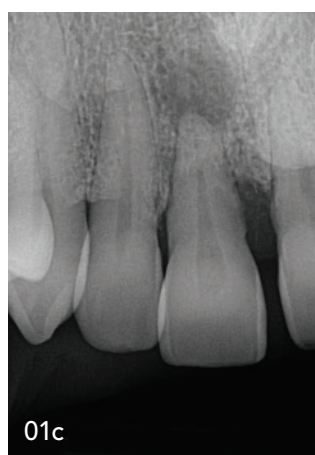


Single unit implant rehabilitation in the aesthetic area

Zi Ceramic Implant System in use with immediate loading associated with Socket Shield technique

Dr Geninho Thomé, Carolina Accorsi Cartelli, Dr Sérgio Rocha Bernardes, Dr Jean Uhlendorf, Brazil



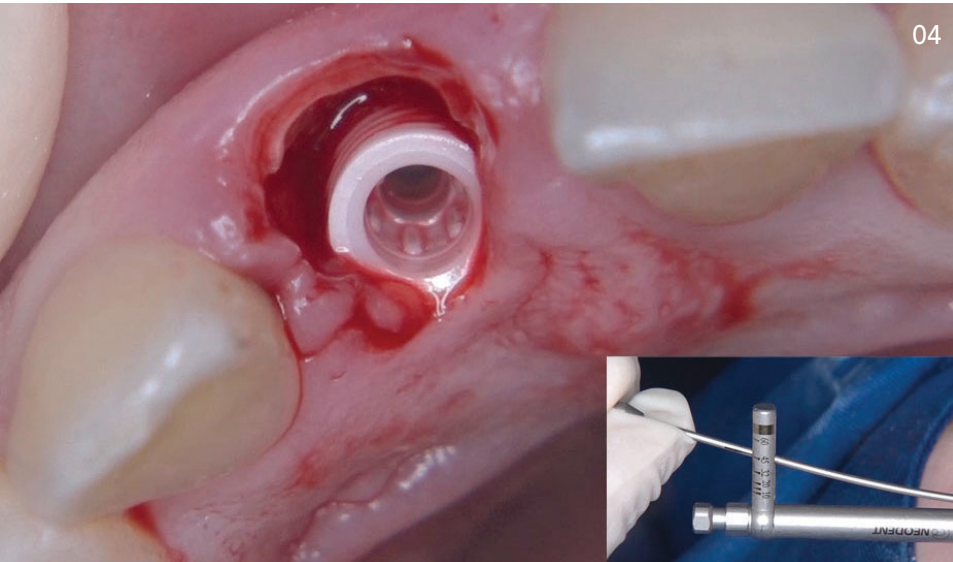
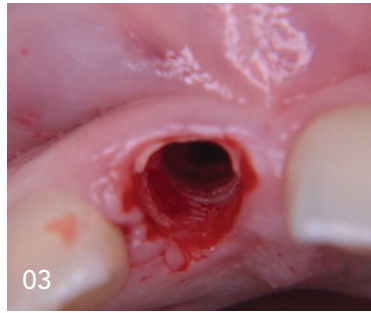
01a-c
Patient's initial situation: patient's smile, occlusal view and periapical X-ray (tooth 11).

“The Socket Shield prevents bone loss and gingival recession while enhancing implant stability and producing a more natural-looking outcome.”

Introduction

To restore teeth to their natural appearance and function, aesthetic rehabilitation in dentistry requires accuracy. The selection of methods and materials is essential. Due to their exceptional biocompatibility and attractive features, two-piece injection-molded zirconia implants have gained enormous attention.^{1,2}

High biocompatibility of zirconia implants lowers the risk of rejection and inflammation, among other benefits.³ Compared to standard titanium implants, their white hue closely matches natural teeth, offering greater aesthetics.⁴ The injection molding technology in their production ensures perfect adaptation and long-term durability due to its high accuracy and strength.⁵ Because of these qualities, zirconia implants combine practical and aesthetic advantages, making them a promising alternative for dental restorations.⁶



02-04

Steps of the surgery: occlusal view after dental section and maintenance of the buccal fragment. Evidence of thread formation in the dental socket. Neodent® Zi 4.3 x 13mm implant installed (45Ncm).

The Socket Shield method preserves a portion of the native tooth root after implant insertion, the alveolar bone and surrounding soft tissues are kept intact. This prevents bone loss and gingival recession while enhancing implant stability and producing a more natural-looking outcome.⁷ Inject-molded zirconia implants combined with the Socket Shield method are a significant break-through in cosmetic dentistry that provides excellent aesthetic and functional outcomes.^{7,8}

In addition to their visibility and aesthetic requirements, dental operations in the maxillary aesthetic areas can be extremely difficult. To guarantee immediate loading, long-term functionality, and harmonious soft tissue aesthetics, these procedures require meticulous and customised planning.⁹ Considering the functional and aesthetic requirements of the clinical case, this study uses a two-piece ceramic implant with the Socket Shield technique to treat the right central incisor region.

General aspects and health conditions

Female, 37 years old, with aesthetic complaints due to the presence of diastema between the upper central incisors with a progressive increase in the space between the teeth over time. (Figs. 1a & b). After the clinical evaluation and periodontal probing, periodontal involvement of the right incisor was ob-



Variety of Choices



“Ceramic implants have been indicated more frequently over the years, especially in cases of rehabilitation in anterior regions (upper jaw) in patients who have high aesthetic expectations.”

served: deep probing (more than 6 mm in 03 sites) and grade I mobility. After carrying out imaging exams: panoramic, periapical radiographs and CBCT, crestal bone resorption and periapical lesion were observed (Fig. 1c). Considering this diagnostic, the installation of a ceramic implant in the region of tooth 11 was proposed for the patient, using the Socket Shield technique followed by upper lip frenectomy and immediate loading.

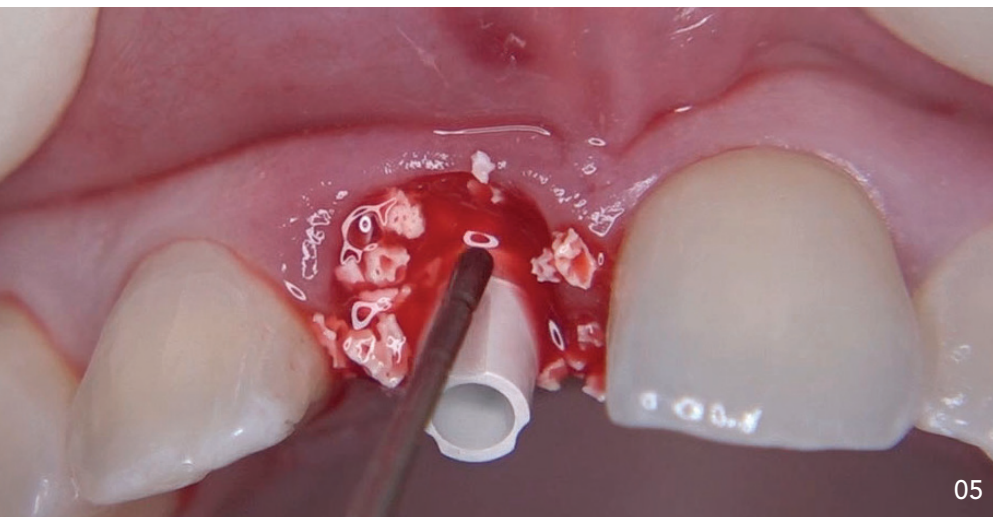
Surgical technique

Initially, an anaesthetic infiltration block was performed in the anterior portion of the right superior alveolar nerve and complemented by palatal with subperiosteal infiltration. To preserve the buccal bone wall and maintain the thickness of connective tissue on the same face, it was decided to perform the Socket Shield surgical technique, preserving the buccal fragment of the root (infraosseous). Started with a dental section (Zeckria drill), remo-

tion of the palatal portion of the root and curettage of the periapical lesion, followed by grinding and finishing (conical diamond drill with rounded end) of the buccal root fragment (Fig. 2). Then the drilling protocol was made according to the manufacturer’s instructions: Spear drill, conical drill Ø 2.0, Ø 3.5, Ø 4.3 and drill for threading (tapping) with Ø 4.3 respectively (Fig. 3). The Neodent® Zi 4.3 x 13 mm implant was installed in the region reaching 45Ncm of torque, allowing immediate load. The space (gap) between the implant surface and the root portion was filled with particulate bone (Cerabone Straumann®; Fig. 4).

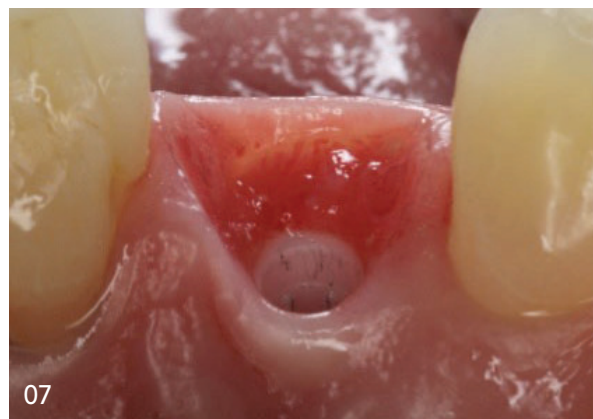
Prosthetic rehabilitation

After implant installation, the narrow PEEK CR abutment (4.0 x 1.5 mm) was selected (Fig. 5). A temporary cylinder was installed to capture the acrylic resin crown, using resin cement, for subsequent installation of the screw-retained crown (torque of 32Ncm,



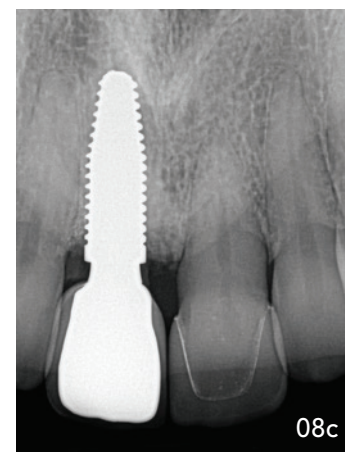
05 + 06
Surgical step: CR abutment installed and insertion of the bone graft (Cerabone Straumann) into the gap. Patient’s smile after implant installation and immediate temporary prosthesis.

07
Follow-up (five months) showing the healthy appearance of gingival tissue after removing the prosthesis for the scanning of the final crown.





08a-c
Follow-up
(two years of the
installation of the
implant): buccal
and occlusal
views, and X-ray.



“Two-piece zirconia implants also avoid wound healing problems and undesirable loading during the healing period, which are disadvantages of one-piece zirconia implants.”

Fig. 6). In the fifth month of postoperative follow-up, the provisional prosthesis was unscrewed (Fig. 7), and the scanning was done to create the definitive prosthesis. The scan body was installed, and through intra-oral scanning, the definitive prosthesis was manufactured (Zirconia). Thus, using the printed model, the crown was cemented onto the ZiBase (3.75x4.0x1.5) with resin cement and then installed with 32Ncm of torque.

Discussion and final considerations

Ceramic implants have been indicated more frequently over the years, especially in cases of rehabilitation in anterior regions (upper jaw) in patients who have high aesthetic expectations. Clinical performance of two-piece zirconia dental implants after five and up to 12 years.¹⁰ The literature about ceramic implants shows satisfactory results about the biological, mechanical, and aesthetic properties.^{1,2,11}

In this case, it was decided to use the surgical technique called Socket Shield and the use of a Zi System implant (Neodent) to achieve a completely satisfactory result. Maintenance of the buccal root fragment provides anatomical preservation of periodontal structures and prevents long-term recession of the bone

and gingival tissue. During the drilling (sequence of drills) and the installation of the implant, it is necessary to take much care to avoid an excess of pressure at the remaining tooth and consequent displacement of them.¹¹

Most of the clinical investigations describe the use of one-piece zirconia implants instead of the employ of two-piece zirconia implants to treat partial or total edentulous patients.¹² In this case report, the use of two-piece zirconia implants presents several advantages, including the increase of prosthetic versatility due to the variability of abutments options. Two-piece zirconia implants also avoid wound healing problems and undesirable loading during the healing period, which are disadvantages of one-piece zirconia implants.¹³

This case shows survival and success during two years of follow-up. Four systematic literature reviews^{14–17} cited a few clinical cases about the use and survival of two-piece zirconia implants. Haro Andanez et al.¹⁴ and Hashim et al.¹⁸ described the clinical studies performed by Cionca et al. and Payer et al., which were previously described. Haro Andanez et al. also described the clinical studies from Becker et al.¹⁹ and Brüll et al.²⁰ and performed a meta-analysis. Considering only the two-piece zirconia implants the implant survival rate was 94% between one and three years of follow-up.

“Periodic clinical and radiographic monitoring is essential for the control of peri-implant tissues and the success of the rehabilitation.”

Periodic clinical and radiographic monitoring is essential for the control of peri-implant tissues and the success of the rehabilitation. The present case has 24 months of follow-up with great results. It was possible to observe clinical (Figs. 8a & b) and radiographic (Fig. 8c) images of the implant and prosthesis about the following factors: complete osseointegration, maintenance of the marginal bone level (no signs of peri-implantitis), excellent aesthetics and soft-tissue function, reflecting the success of this treatment. Further research is required to evaluate the long-term outcomes.



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Dr Thomé holds a degree in Dentistry from the Federal University of Santa Catarina, a specialisation in Periodontics and Implantology, and a Master’s and Doctorate in Implantology. Dr Thomé is currently the Scientific President of Neodent, Chairman of the Board of Directors of Neodent, and General Director of ILAPEO College.

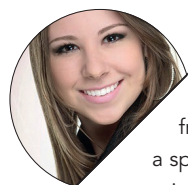
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Dr Bernardes holds a degree in Dentistry from the Federal University of Rio de Janeiro (1995–1999), a specialisation in dental prosthetics from APCD/Bauru (2000–2002), a specialisation in Implantology recognised by the CFO (2007), a master’s degree in Dentistry (Oral Rehabilitation) from the Federal University of Uberlândia (2003–2005) and a PhD in Dentistry (Oral Rehabilitation) from the School of Dentistry of Ribeirão Preto, University of São Paulo, with research in collaboration with the Eastman Dental Institute, London (2005–2008). Dr Bernardes holds a post-graduate degree and an MBA in Business Management from the Getulio Vargas Foundation (2009–2011). Dr Bernardes is certified by the Portuguese Dental Association for passing the equivalence exam (2007). He is a member of the review board of the *International Journal of Oral and Maxillofacial Implants* and Editor-in-Chief of *Prosthesis Laboratory in Science*. He is currently a professor at the Latin American Institute of Dental Research and Education (ILAPEO) and Head of Global Research & Education at Neodent.

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Literature





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