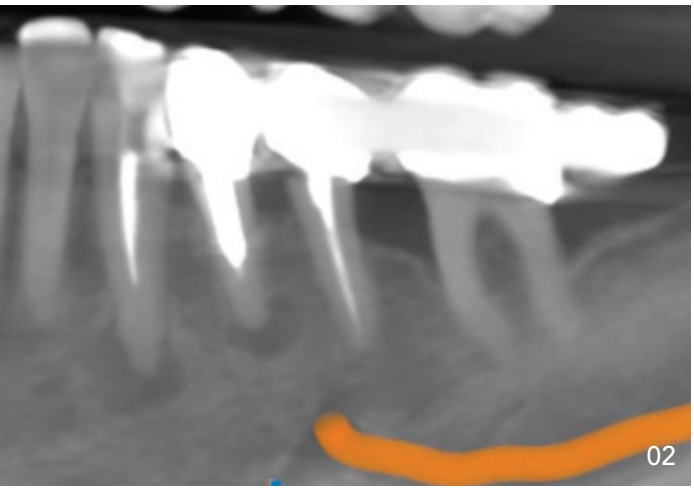
Immediate implantation with two-piece ceramic implants in the mandibular premolar region

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01
Preoperative clinical view showing secondary caries beneath existing crowns on teeth #34–36.

02
Periapical radiograph revealing large periapical lesions and fenestration defects at teeth #33, #34, and #35.

Abstract

A 65-year-old female patient presented seeking a metal-free dental implant solution to replace infected root canal-treated teeth #33, #34, and #35. The patient expressed concerns about possible immune or allergic reactions to metallic materials. This case demonstrates the use of a fully digital workflow, from diagnosis and guided surgical planning to immediate placement of two-piece AWI G-Line zirconia implants and provisional restoration. The treatment highlights the system's biocompatibility, mechanical stability, and natural aesthetic integration.

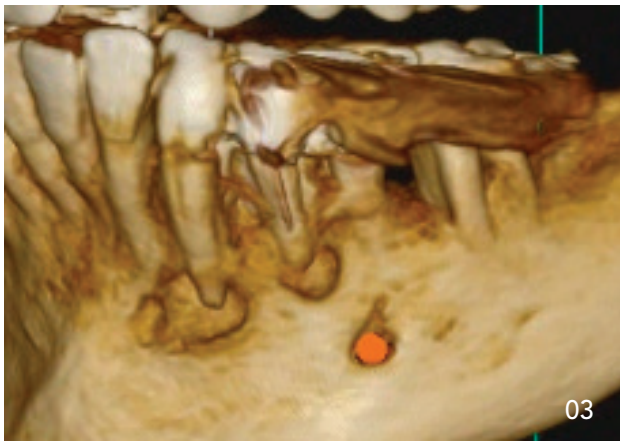
Case description

A 65-year-old woman presented with discomfort and swelling in the lower left mandibular region. Her chief complaint was discomfort around the existing splinted bridge and a desire to replace it with a metal-free restoration due to allergy concerns. She was otherwise in good general health with no systemic disease but reported a history of metal sensitivity.

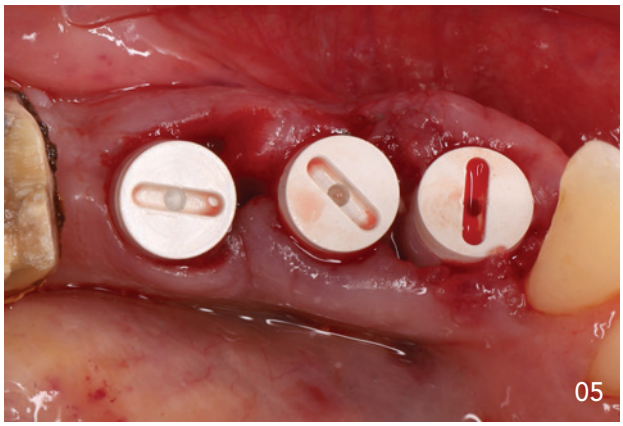
Clinical and radiographic examination revealed that teeth #33, #34, and #35 had previously undergone root canal treatment. Tooth #33 presented a large periapical lesion with buccal fenestration, while teeth #34 and #35, which were splinted together with #36 under a single bridge, also showed large periapical lesions and fenestration-type bone defects. Tooth #36 was a vital natural tooth, acting as the distal abutment for the old bridge that extended as a cantilever to #37.

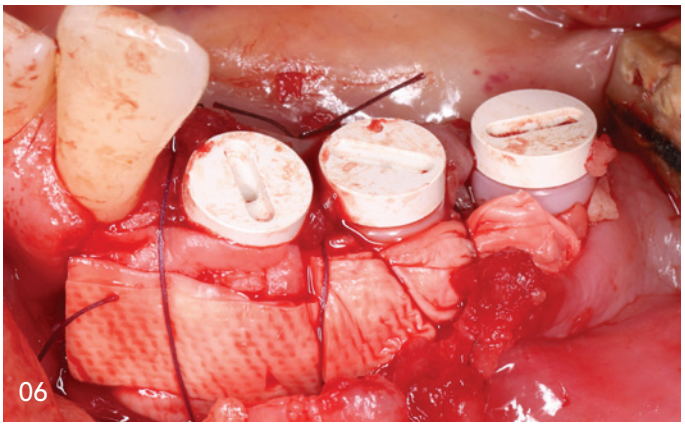
Digital planning and surgical preparation

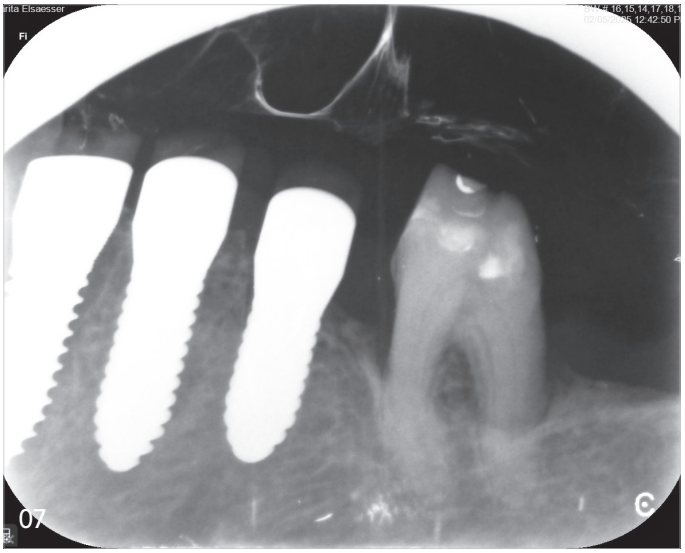
All diagnostic data—including CBCT, panoramic radiograph, and a 3D intra-oral scan (TRIOS, 3Shape)—were integrated into 3Shape Implant Studio for digital guided implant planning. Radiographic analysis showed limited bone height between the apical socket and the inferior alveolar nerve, especially in the premolar area. Therefore, the treatment plan aimed to achieve











primary stability from the intact socket walls rather than extending apically.

A prefabricated PMMA temporary bridge was digitally designed, supported by a temporary abutment on tooth #36 and a wing extension to tooth #32. The temporary was designed with a 2 mm gingival clearance to minimise disturbance to soft- and hard-tissue healing and maintain functional occlusal anatomy.

Surgical procedure

On the day of surgery, the existing crowns on teeth #34–36 were removed. Teeth #33, #34, and #35 were extracted atraumatically, with particular care taken to preserve the alveolar socket walls. The extraction sockets were thoroughly curetted and degranulated using a round diamond degranulation bur and curettes to eliminate granulation tissue and residual infection.

Under digital guidance three AWI G-Line two-piece zirconia implants were placed immediately into the extraction sockets—#33 (3.9 × 10 mm) and #34, #35 (3.9 × 12 mm). Each implant achieved an insertion torque of 35 Ncm, confirming excellent primary stability.

The residual bone defects were grafted with cortico-cancellous allograft and covered with an Osteobiol peritoneum membrane. An additional OSSIX Volumax collagen scaffold (GLYMATRIX® technology) was posi-

03
3D digital simulation showing buccal fenestration, apical lesions, and bone defect prior to planning.

04
Clinical view after crown removal on teeth #34–36 before extraction.

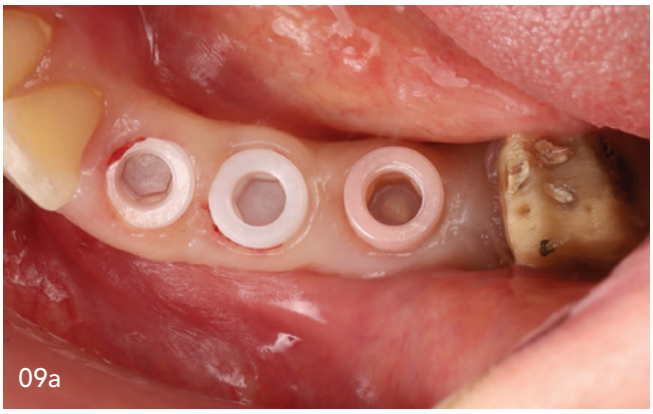
05
Placement of two-piece AWI G-Line zirconia implants (#33–35) prior to grafting, illustrating immediate implantation.

06
Surgical site after placement of cortico-cancellous bone graft, Osteobiol peritoneum membrane and OSSIX Volumax collagen scaffold, followed by suturing with nylon 4/0 and PGA 5/0.

07
Prefabricated PMMA temporary bridge fixed between implant #33 and tooth #36 using TempBond Clear, designed out of occlusion.

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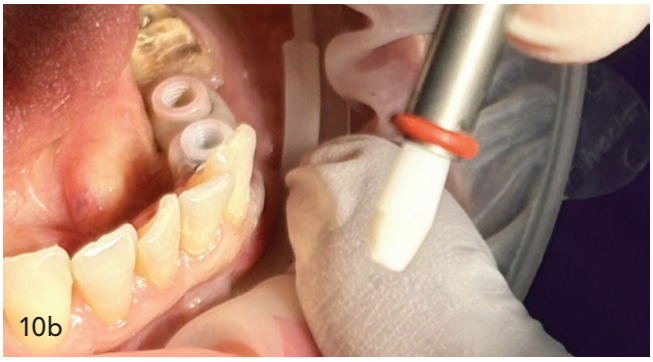
08
Three-month follow-up demonstrating healthy soft-tissue maturation and contour development.

09a+b
Six-month follow-up after cover-screw removal, showing excellent peri-implant tissue health.

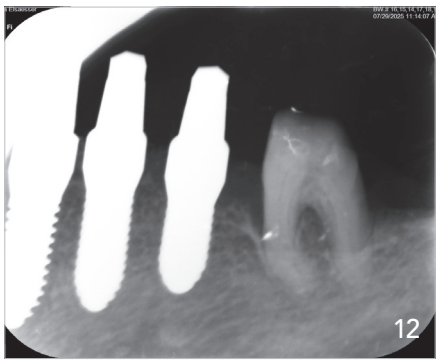
10a+b
Application of mixed 3M Ketac GI cement on abutments prior to final fixation.











11
Prepared abutments before digital scanning, showing precise margins and emergence profile.

12
Radiograph after final fixation of the abutments and prior to intraoral preparation.

tioned over the grafted area to enhance volume stability, support soft-tissue regeneration, and promote gradual ossification.

The implant fixtures were covered, and the soft tissue was sutured using nylon 4/0 and PGA 5/0 sutures. A prefabricated PMMA temporary bridge was then fixed between implant #33 and tooth #36 using TempBond Clear (non-eugenol temporary cement). The temporary restoration was designed to remain out of occlusion to minimise loading and allow undisturbed healing during the osseointegration phase.

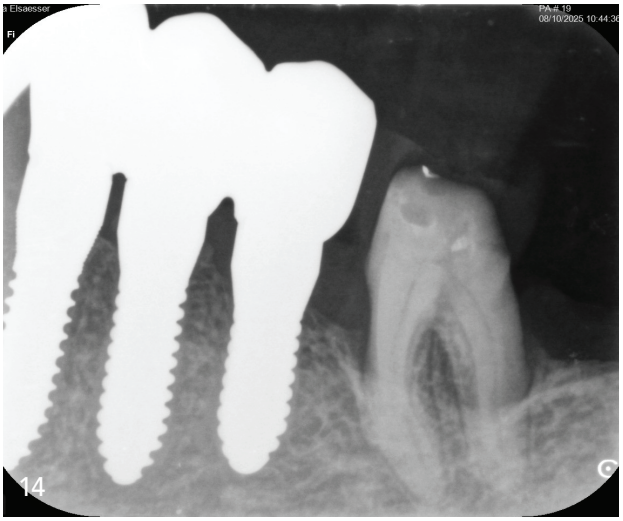
Healing and final restoration

After six months, clinical and radiographic evaluation confirmed uneventful healing, stable bone levels, and healthy peri-implant soft tissue. The temporary bridge was removed, and the definitive abutments were cemented using 3M Ketac Glass Ionomer Cement, torqued to 15 Ncm as per manufacturer guidelines.





13a+b
Final zirconia crowns on implants #33–35 and tooth #36, demonstrating natural colour harmony and healthy gingiva.



14
Postoperative periapical radiograph confirming successful osseointegration and stable bone levels.

The abutments were prepared using a fine red diamond bur, and a digital impression was recorded with the 3Shape intra-oral scanner. Final monolithic zirconia crowns were fabricated and cemented with GI cement. The final prosthetic phase included zirconia crowns on implants #33–35 and a new zirconia crown on the natural tooth #36, restoring function and aesthetics while maintaining a fully metal-free workflow.

What impressed me most was the ability to prepare the implant fixture and abutment just like a natural tooth, allowing for precise margin control and a beautifully natural emergence profile. The pink-white harmony of the zirconia implant base blended seamlessly with the gingiva, avoiding the gray shadow typical of metal implants.

Discussion

This case demonstrates the predictable functional and aesthetic results achievable with AWI G-Line two-piece zirconia implants following immediate extraction. The system's biocompatibility and colour stability promoted natural tissue integration, while digital planning ensured accuracy and reduced surgical trauma. The use of OSSIX Volumax collagen scaffold supported both bone regeneration and soft-tissue architecture, contributing to a stable, healthy peri-implant profile.

For patients with metal allergies or sensitivities, zirconia implants represent a safe, biologically harmonious, and highly aesthetic alternative to titanium systems, offering long-term stability and optimal integration.

Conclusion

This case highlights the successful use of immediate implantation with two-piece AWI G-Line zirconia implants in the mandibular premolar region, demonstrating the effectiveness of a fully digital, metal-free workflow. The outcome achieved excellent aesthetic integration, soft-tissue stability, and patient satisfaction—offering a reliable solution for patients seeking metal-free, biocompatible implant rehabilitation.

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