Aesthetic rehabilitation of lateral incisor agenesis

Multidisciplinary clinical approach using narrow-diameter implants

Modern dental rehabilitation relies on the convergence of multiple disciplines to achieve biologically sound, functional, and aesthetically harmonious outcomes. Isolated interventions, while sometimes effective, often fail to account for the complex interactions among occlusal forces, soft-tissue dynamics, and smile aesthetics.

Dr Zafer Kazak, Turkey

Orthodontic therapy establishes ideal space and root positioning, while surgical and prosthetic phases must ensure precise implant placement and restoration in harmony with gingival architecture. A multidisciplinary approach integrating orthodontics, oral surgery, implantology, periodontology, and prosthodontics enables customised treatment planning and precision at every stage.

Dental agenesis is more common in females than in males, and the maxillary lateral incisors are the second most commonly affected teeth in congenital hypodontia.[1] This can have a significant impact on aesthetics, occlusal balance and self-esteem, especially in the youth. In such cases, achieving symmetry and proportion requires both careful space management and strategic restorative planning. The challenge intensifies when limited interdental width constrains implant placement. Narrow-diameter implants, such as the bredent medical copaSKY 3.0, offer a reliable, minimally invasive solution that does not require bone augmentation, while maintaining stability and aesthetic integration. Literature indicates that narrow-diameter implants are a predictable treatment option, since they afford clinical results comparable to those obtained with implants of greater diameter.[2]

This report presents a coordinated, interdisciplinary rehabilitation of a young female patient with bilateral lateral incisor agenesis, deep bite, and multiple diastemas, managed through a sequence of orthodontic, surgical, periodontal, and prosthetic interventions.



01
Preoperative frontal view of the facial profile.

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NEOSS PROACTIVE® IMPLANTS

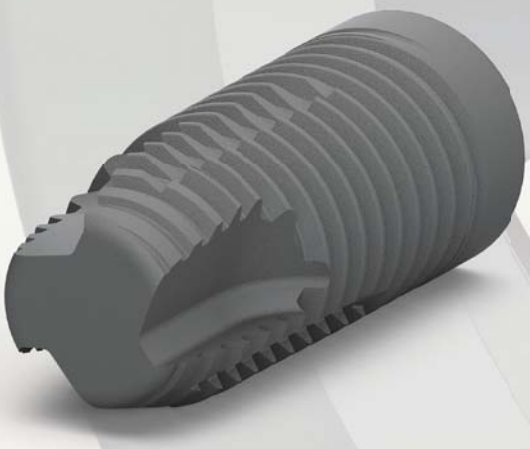
Simply *successful* treatment



FOLLOW-UP PERIOD: OVER 10 YEARS
STUDY DATASET: 1,648 IMPLANTS



98.4% Implant Survival rate
after 10 years.



Long term clinical performance of superhydrophilic dental implants with more than 10 years follow-up, Clinical Oral Implants Research, Hassfurther ND, Hassfurther N., EAO-332/PO-SU-022



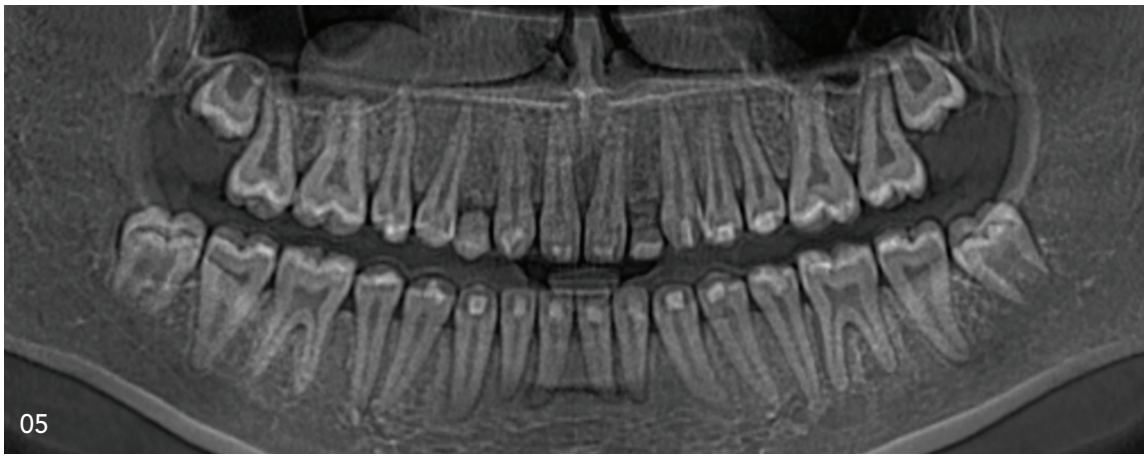


02
Preoperative right lateral intra-oral view.

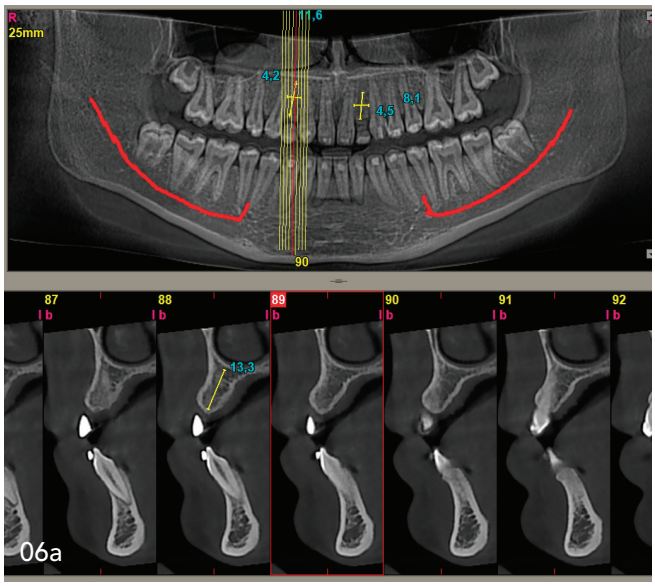
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Preoperative left lateral intra-oral view.



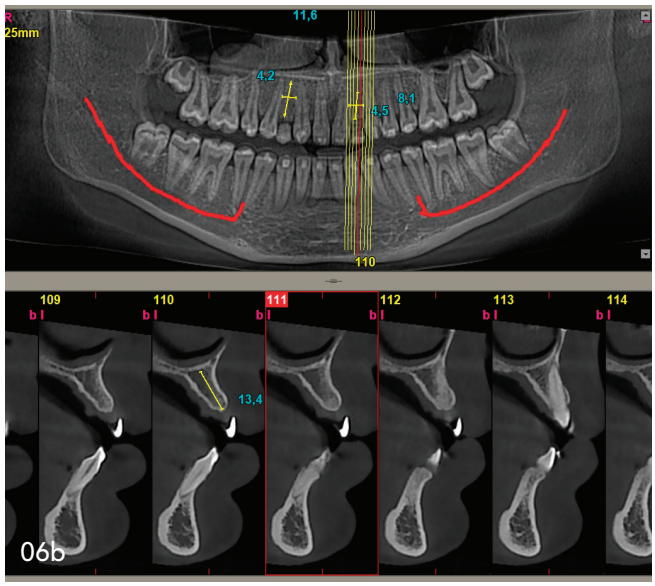
04
Preoperative frontal intra-oral view.



05
Preoperative OPG.



06a
CBCT evaluation of the right canine region.



06b
CBCT evaluation of the left lateral incisor region.

Case presentation

An 18-year-old, systemically healthy female patient presented with aesthetic and functional concerns. Extraoral examination revealed an acceptable facial profile (Fig. 1) with minor lip incompetence, while intra-oral findings included bilateral missing maxillary lateral incisors, multiple anterior diastemas, slightly proclined incisors, an accentuated curve of Spee and a deep bite along with a Bolton discrepancy (Figs. 2–4).

Radiographic evaluation (Panoramic and CBCT) confirmed bilateral agenesis of the maxillary lateral incisors and adequate bone volume for narrow-diameter implant placement following orthodontic space redistribution (Figs. 5–6b).

Treatment planning

Following cephalometric and model analysis, an interdisciplinary plan was developed. Orthodontic correction was initiated to create space for implant placement at sites #13 and #22, establish appropriate canine guidance, and reduce the deep bite through controlled intrusion of the anterior teeth and extrusion of the posterior teeth. The orthodontic phase was scheduled for approximately 20 months, followed by the surgical placement of two narrow implants, soft-tissue optimisation, and final prosthetic rehabilitation.

Orthodontic phase

Orthodontic treatment aligned both arches, corrected the deep bite, redistributed space symmetrically to create ideal mesiodistal dimensions for implant placement, and corrected the axial inclinations of the teeth. Hence, occlusal correction was performed, and aesthetic space proportions were established for surgical and prosthetic rehabilitation (Figs. 7+8).

Surgical phase

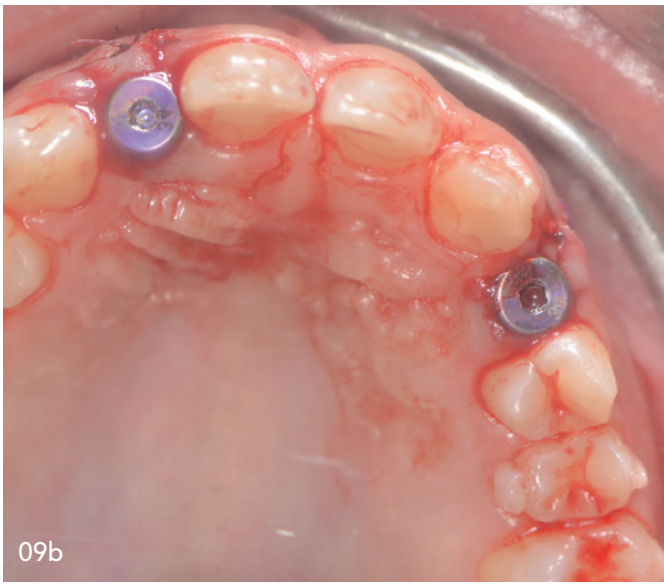
Implantology

After creating space orthodontically, two narrow-diameter implants (copaSKY, 3.0 mm, bredent medical) were placed (Figs. 9a+b) using a roll-flap technique in sites #13 and #22, with lengths of 12 mm and 8 mm, respectively.[3] The copaSKY 3.0 implants were ideal in the current clinical situation as they can successfully be used in mesiodistal spaces of approximately 6 mm with high primary stability and subcrestal placement for immediate restorations owing to the unique compression thread with a blasted and etched surface characteristic of the implant design.









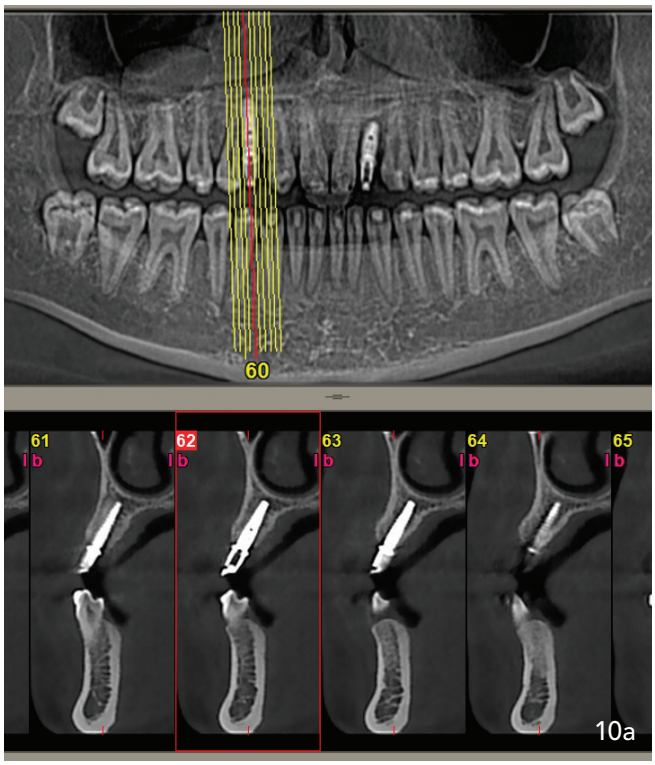
07
Postorthodontic space creation for implant placement in the right canine region.

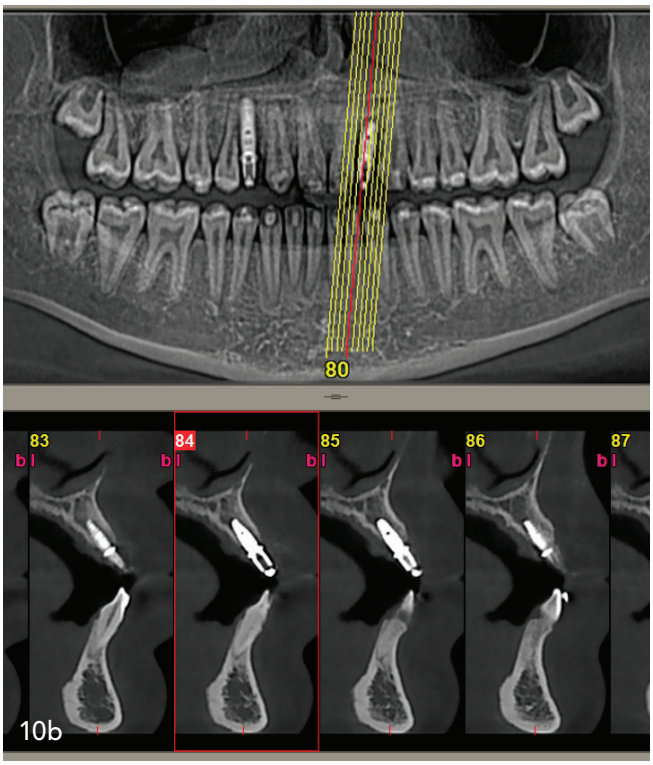
08
Postorthodontic space creation for implant placement in the left lateral incisor region.

09a
Implant placement with concomitant soft-tissue manipulation using the roll-flap technique.

09b
Occlusal view demonstrating implant placement for the missing teeth.

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10a
Postoperative evaluation of site #13 demonstrating optimal implant positioning.

10b
Postoperative evaluation of site #22 demonstrating optimal implant positioning.

"When congenital agenesis presents with limited interdental space and altered occlusal relation, narrow-diameter implants become a biologically respectful alternative that preserves tissue architecture while avoiding unnecessary augmentation."





11
Immediate implant-supported provisional crowns.

12
Definitive prosthetic rehabilitation with IPS e.max veneers and all-ceramic crowns on BioHPP abutments.



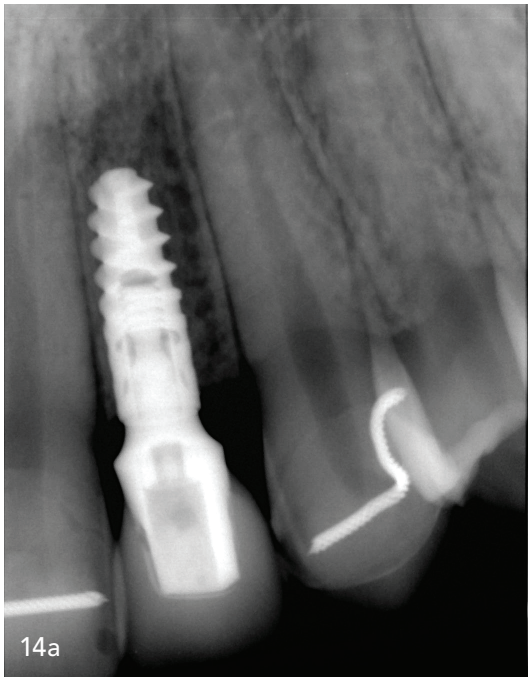


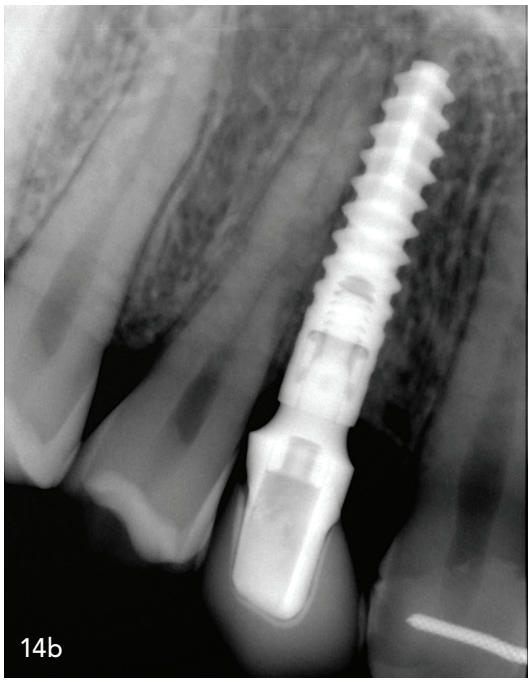


13a
Immediate posttreatment frontal view of the facial profile.

13b
Immediate post-treatment right lateral view of the facial profile.

13c
Immediate post-treatment left lateral view of the facial profile.





14a
Periapical radiograph of site #22 demonstrating stable crestal bone levels at the six-month follow-up.

14b
Periapical radiograph of site #13 demonstrating stable crestal bone levels at the six-month follow-up.

A minimally invasive, laser-assisted approach (Fotona® Er:YAG) was used to aid soft-tissue management during surgery. Implant placement was confirmed with postoperative CBCT scans to ensure accurate angulation and emergence profile (Figs. 10a+b).

Periodontology
Gingivectomy was performed on the upper anterior teeth to contour gingival zeniths and optimise crown lengths following orthodontic treatment. This helped achieve a harmonious balance between white and pink aesthetics.

Prosthodontics
Immediate function and aesthetics were established by providing implant-supported provisional crowns on the day of surgery (Fig. 11). The final restoration was full ceramic crowns on BioHPP abutments (bredent). BioHPP is a ceramic-reinforced polymer derived from polyether ether ketone (PEEK). Its inherent structural characteristics and surface morphology provide distinct mechanical and biological advantages for prosthetic rehabilitation, achieving a clinical balance between elasticity and rigidity, low weight and high fracture resistance, along with excellent biocompatibility and reduced plaque accumulation.[4] IPS E.max (Ivoclar Vivadent) laminate veneers were placed in the anterior region to re-establish aesthetics and functional harmony (Fig. 12). The patient was satisfied with the smile-makeover achieved (Figs. 13a–c).

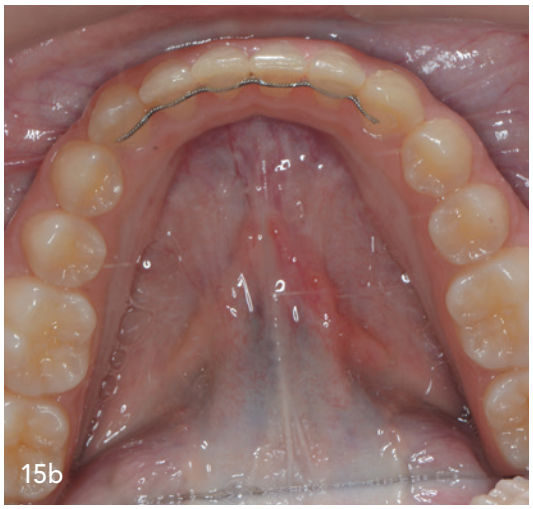
Follow-up assessment

No complications were detected at the six-month routine clinical recall. Radiographic examination revealed stable crestal bone levels (Figs. 14a+b), and clinical evaluation confirmed that the orthodontic

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15a
Occlusal view of the maxillary anterior region at the six-month follow-up.



15b
Occlusal view of the mandibular anterior region at the six-month follow-up.



16
Clinical view at the six-month follow-up demonstrating a healthy gingival profile.

retainers remained in position (Figs. 15a+b), with healthy, firm gingiva and satisfactory pink aesthetics (Fig. 16). The patient was very pleased with her facial profile (Figs. 17a–c) at the follow-up visit.

Clinical implications

This case highlights that predictable aesthetic rehabilitation of lateral incisor agenesis hinges on coordinated interdisciplinary planning. Narrow-diameter implants can be placed safely in reduced mesiodistal spaces (as little as 6 mm) between dental elements, especially when preceded by orthodontic space optimisation to create more space and followed by precise soft-tissue sculpting and prosthetic control. The multifunctional back-tapered microtextured implant neck (copaSKY 3.0) in combination with the abutment material (Bio-HPP, bredent) are essential prerequisites for the 3D formation of bone and a gingival cuff that protects the implant. It is now generally accepted that both mucointegration and osseointegration are important for the successful management of patients with implants. A stable and reversible conical-parallel-walled implant–abutment connection facilitates easy retrievability of the prosthesis should the need arise in this young adult. BioHPP abutments and modern ceramic systems further support long-term tissue stability by promoting favourable biomechanical behaviour and soft-tissue compatibility. For clinicians treating young patients with congenital agenesis, this workflow reduces the need for invasive augmentation and offers a highly conservative yet stable solution.

Future directions

While narrow-diameter implants continue to show promising outcomes in anatomically constrained sites, long-term comparative studies are needed to clarify their performance relative to standard implants in agenesis cases. Additionally, emerging digital workflows—including facially driven implant planning, dynamic navigation, and advanced polymer abutment materials—may further enhance precision and aesthetic predictability. Integrating these technologies into future protocols could refine interdisciplinary treatment standards and expand conservative implant solutions for young adults.



17a
Frontal view of the facial profile at the six-month follow-up.

17b
Right lateral view of the facial profile at the six-month follow-up.

17c
Left lateral view of the facial profile at the six-month follow-up.





Conclusion

This case reinforces the principle that aesthetic implant dentistry succeeds not through isolated interventions, but through the precise orchestration of multiple disciplines. When congenital agenesis presents with limited interdental space and altered occlusal relationship, narrow-diameter implants become a biologically respectful alternative that preserves tissue architecture while avoiding unnecessary augmentation. Their success, however, is dependent on the preparatory phases such as orthodontic creation of symmetrical space, periodontal refinement of gingival contours, and prosthetic control of emergence profile and load distribution.

By integrating these elements, the present rehabilitation achieved stable peri-implant bone levels, harmonious soft-tissue architecture, and natural anterior aesthetics. More importantly, the outcome illustrates that when biologic limitations are acknowledged and respected, minimally invasive implant designs can restore both form and function without compromising long-term stability. This interdisciplinary pathway offers a predictable template for managing lateral incisor agenesis in young patients, where the demand for precision is high and the margin for error is low.

Acknowledgements

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- Dr Seda Gönülay—Periodontology
- Dr Mustafa Gürkan—Prosthodontics



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