P21

Immediate Implant Placement Using a Custom Healing Abutment Utilized as a Scanbody: One-time, One-abutment Approach

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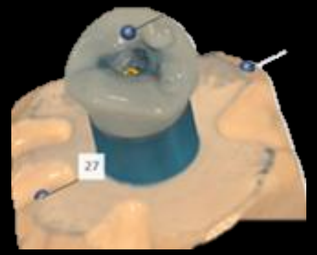

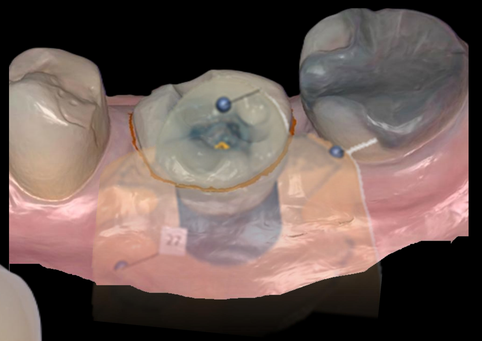

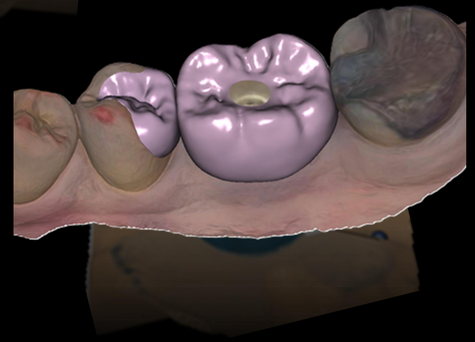

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Introduction:

To achieve stable peri-implant soft tissue morphology from the early healing phase, minimizing prosthetic interventions is essential. In immediate implant placement, maintaining the transmucosal contour and preserving the mucosal seal are critical for long-term success. This case report describes a clinical approach that integrates the one time one abutment concept using a custom healing abutment utilized as a scanbody, enabling predictable soft-tissue guidance and digital reproducibility.

Method:

A 54-year-old female presented with root caries in the mandibular first molar, which was deemed non-restorable. Following atraumatic extraction, a tapered implant with a moderately rough surface (Ø5.5 × 10 mm) was placed using dynamic navigation. A low-profile base abutment (Ø1.75 mm / wide platform) was connected, onto which a custom healing abutment was fabricated chairside and finalized by the dental technician. The abutment was designed with reference points, allowing it to be utilized as a scan body for intraoral scanning. Postoperative intraoral data were matched with the preoperative digital index model, enabling correlation between implant position and soft-tissue contour without abutment removal. After the healing phase, a provisional restoration was fabricated, followed by the final restoration designed from the integrated digital data.

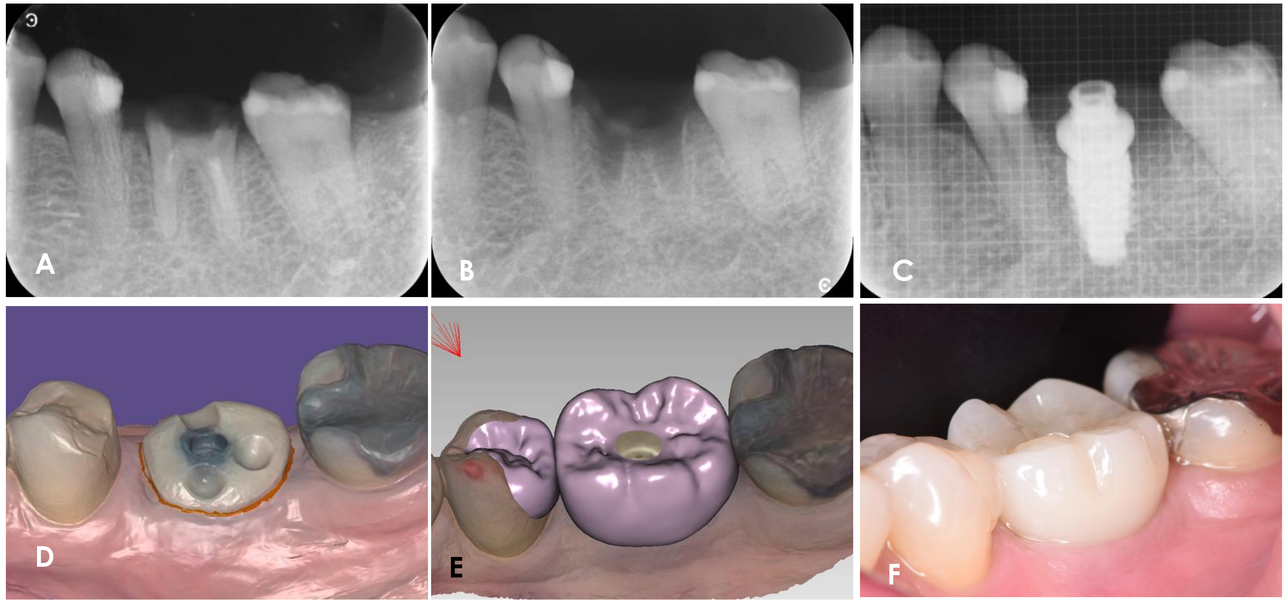
Results:

This approach enabled predictable soft-tissue contouring and stable transmucosal morphology. The continuously retained abutment minimized abutment disconnections, preserving the mucosal seal and supporting peri-implant tissue stability. The custom healing abutment used as a scan body allowed accurate transfer of the emergence profile and simplified the restorative workflow.

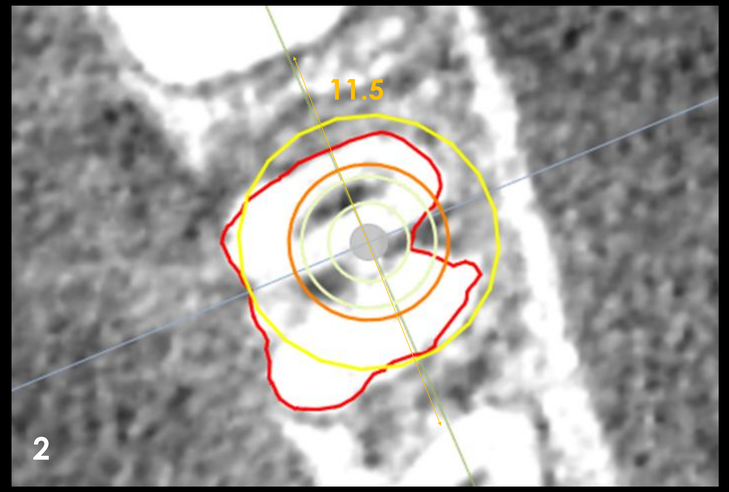
Conclusion:

The present approach combines the one time one abutment concept with a custom healing abutment utilized as a scan body, optimizing the digital workflow and preserving peri-implant soft-tissue stability in immediate implant placement.

A PA of #19 **B** PA after extraction **C** Implant placement at #19
D Custom healing abutment utilized as a scanbody **E** Provisional restoration **F** Final restoration



TREATMENT PLANNING



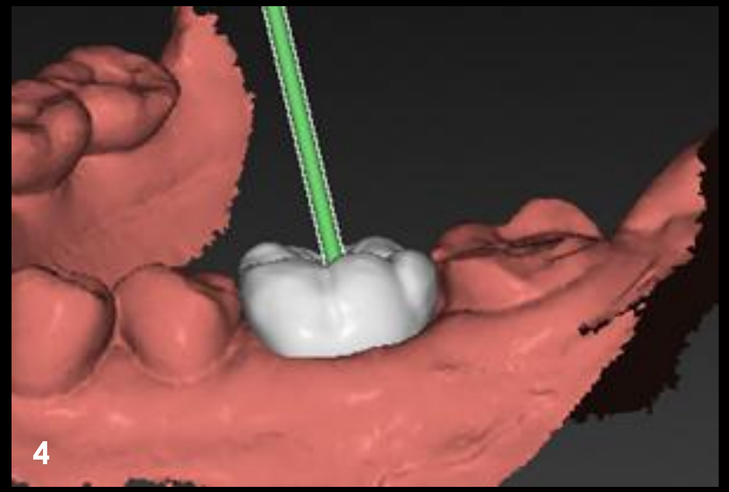


Fig.1 3d-view of #19 before extraction : non-restorable root caries incomplete vertical fracture

Fig.2 Pre-extraction coronal CBCT section showing a tooth planned for atraumatic extraction, expected to result in a Type B socket, with planned implant positioning to maintain ITD < 4 mm.

Fig.3 The top of the septum bone is used as vertical position of the implant approximately 4mm apical to the buccal crest of tissue. Wide platform implant (Ø5.5 × 10 mm) and a low-profile base abutment (1.75mm) were selected for the "one-abutment/one-time" approach.

Fig.4 Prosthetically driven digital wax-up and implant positioning were planned using a smart wax-up function in implant planning software.

Chu SJ, Tarnow DP, Salama MA. The Single-Tooth Implant: A Minimally Invasive Approach for Anterior and Posterior Extraction Sockets. Hanover Park, IL: Quintessence Publishing; 2023.

SURGICAL PROCEDURE

Fig.5,6 After atraumatic extraction, Er:YAG laser was used for socket debridement.

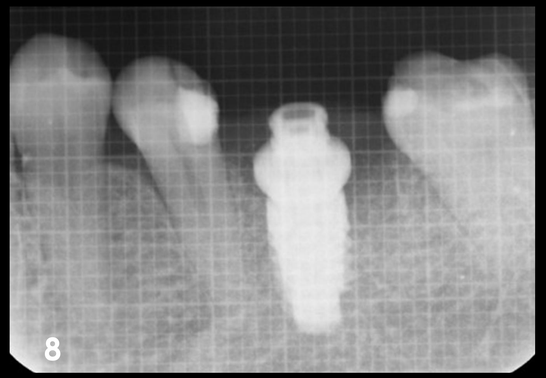
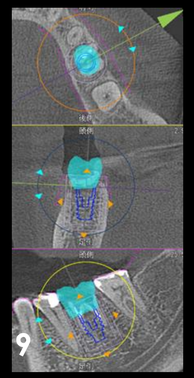


Fig.7,8 Periapical radiograph of extraction socket: the septum bone is preserved and the implant was placed that engaged both the septum and mesial socket.



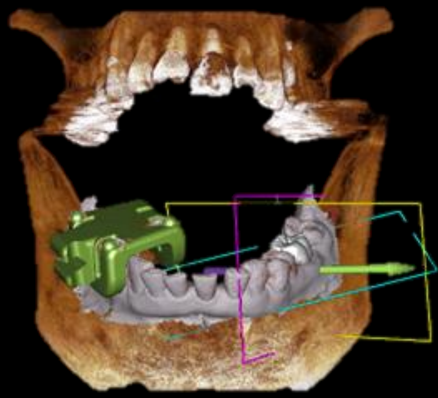


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Fig.9 Dynamic navigation was used for real-time monitoring of anatomical structures, such as the interradicular septum and socket walls, during immediate implant placement.

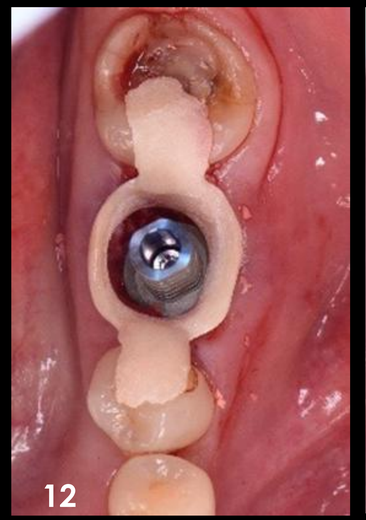
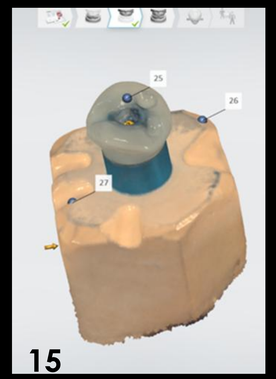


Fig10-13 Ø5.5 × 10 mm implant was placed and a low-profile base abutment was connected. The bone of the socket gaps was to preserve ridge architecture for esthetic. A preformed gingival shell was used to fabricate a custom healing abutment to maintain the peri-implant architecture.

PROSTHETIC WORKFLOW



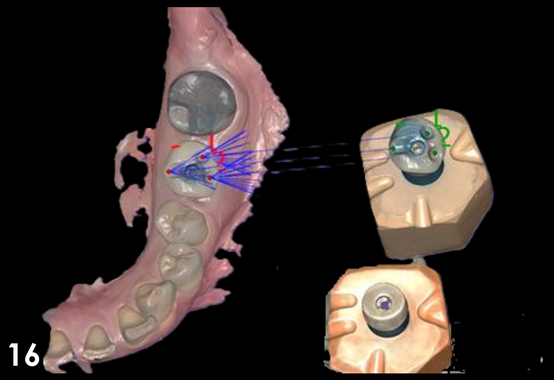
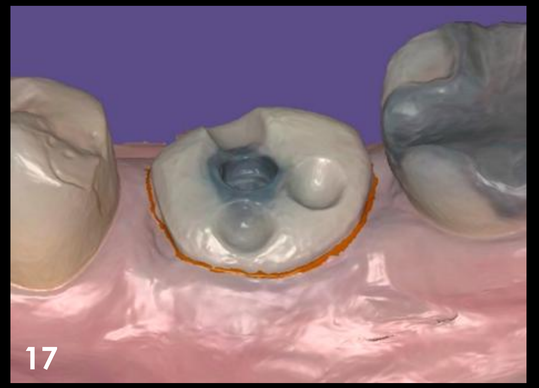


Fig14-16 The custom healing abutment was designed with reference points, scanned on the index model, and used as a scanbody for reference-point matching with the intraoral data.



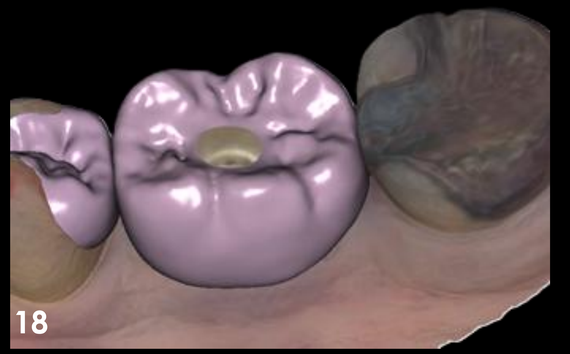


Fig17,18 The margin of the custom abutment was defined by extracting the margin line from the scanned soft-tissue contour, and a provisional crown was designed with distal contour modification of the adjacent tooth to improve proximal contact and support papilla formation.

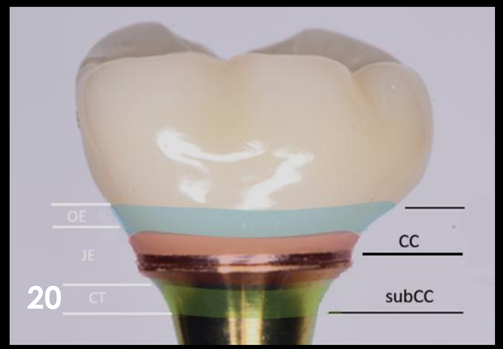


Fig. 19-23 Pre-sintering coloration and ultra-polishing of the zirconia margin (15,000 rpm) to support soft tissue attachment. The contact between the apical one-third of the junctional epithelium and the surface-treated abutment may create a biologically favorable environment for soft tissue attachment due to the presence of hemidesmosome-like structures.

Fabbri G, Sorrentino R. A Biologically Driven Concept to Design the Emergence Profile Around Dental Implants: Surgical and Prosthetic Considerations to Optimize Hard and Soft Tissue Integration. Int J Periodontics Restorative Dent. 2021 Nov-Dec;41(6):913-921. doi: 10.11607/prd.5063. PMID: 34818401.

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