

CASE REPORT

Digitally-Assisted conventional immediate denture in aggressive periodontitis with limited abutments

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ABSTRACT

Keywords: Aggressive periodontitis, Compromised abutments, Hybrid workflow, Immediate denture, Intraoral scanning

Aggressive Periodontitis (AgP) frequently precipitates premature, multi-unit tooth loss in young adults, imposing substantial esthetic and psychological burdens. While the immediate provision of a prosthesis is critical to preclude the damaging edentulous phase and sustain patient confidence, conventional impression techniques inherently pose a significant risk of iatrogenic trauma to the remaining, often highly mobile, fragile abutments. This report details a hybrid digital-conventional protocol designed to maximize clinical safety and esthetic predictability during immediate removable partial denture (IRPD) delivery amidst fragile abutments. A 35-year-old female diagnosed with generalized AgP necessitated the extraction of eleven teeth, with only periodontally sound canines and premolars retained. Intraoral scanning technology was strategically utilized for anatomical data acquisition, successfully mitigating the risk of inadvertent dislodgment of the mobile abutments. The resulting digital data facilitated a precise pre-extraction simulation of the final ridge contour and esthetic try-in, guiding the subsequent conventional laboratory fabrication. An acrylic IRPD was delivered immediately post-extraction, successfully resolving the pre-existing diastema and restoring patient function. The strategic integration of intraoral scanning into a conventional IRPD workflow offers a cost-effective, clinically safe, and highly predictable solution for managing complex immediate prosthetic cases involving limited and compromised supporting structures, thereby enhancing treatment outcomes. (IJP 2025;6(2):107-109)

Introduction

Aggressive periodontitis is a destructive and swiftly progressing periodontal condition typically affecting younger individuals, resulting in premature tooth loss, severe alveolar bone resorption, and functional deficiency. This pathological process often significantly impairs both esthetics and psychosocial well-being, demanding immediate, comprehensive management.^{1,2} The disproportionate bone loss observed relative to localized factors differentiates it from chronic periodontitis.³

The loss of anterior teeth presents a particularly acute distress, impacting speech and self-confidence.⁴ Immediate dentures are a vital therapeutic modality, as they circumvent the psychologically damaging edentulous period, stabilize esthetics, and promote psychological comfort.^{5,6} Furthermore, these prostheses serve a beneficial function as a surgical splint, offering protection to the extraction sites during the initial healing phase.

Contemporary dentistry increasingly leverages digital tools, such as intraoral scanners, to visualize post-extraction anatomy and greatly enhance esthetic predictability, by using digital simulations that allow clinicians to visualize post-extraction outcomes.⁷⁻⁹ However, the expense associated with a fully digital workflow (e.g., 3D printing of the final prosthesis) remains a significant barrier in many clinical settings. Therefore, a hybrid protocol that utilizes highly accurate intraoral scanning for precise diagnosis and planning, combined with cost-effective conventional laboratory fabrica-

tion, represents a balanced and adaptable clinical strategy.

This case report details the successful rehabilitation of a young female patient afflicted by generalized aggressive periodontitis, employing intraoral scanning for critical digital simulation to guide the subsequent conventional fabrication of an immediate removable partial denture.

Case Report Case Presentation

A 35-year-old systemically healthy female sought treatment primarily due to highly mobile anterior teeth and dissatisfaction regarding her smile esthetics. She reported masticatory difficulties and expressed profound anxiety regarding potential edentulism.

Intraoral examination revealed generalized gingival recession, deep probing depths, and Grade III mobility affecting multiple maxillary and mandibular anterior teeth *figure 1*. Panoramic radiography confirmed generalized vertical bone loss, extending extensively into the middle and apical third of the roots *figure 2*. The diagnosis of generalized aggressive periodontitis was confirmed.

Eleven teeth were considered hopeless and indicated for extraction. Premolars and canines, which retained adequate periodontal support, were preserved to serve as abutments.

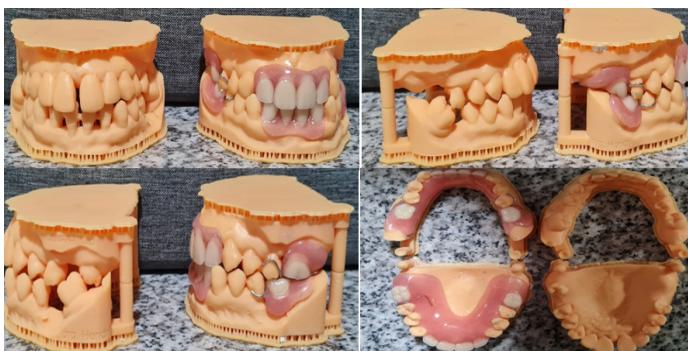
Case Management

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Table 1. Treatment Timeline of the case

Time Point	Clinical Procedures	Findings / Patient Feedback
Day 1 (Initial visit)	Clinical and radiographic examination (panoramic), intraoral and extraoral photographs, intraoral scanning with Runyes V3. STL files sent to laboratory for fabrication of pre-extraction model and digital extraction simulation.	Patient presented with generalized aggressive periodontitis and severe tooth mobility. Expressed concern about esthetics and fear of being toothless.
Week 1 (Treatment day)	Extraction of hopeless teeth, wound suturing, and immediate insertion of removable partial denture.	Prosthesis delivered successfully, restoring esthetics and phonetics immediately after extraction.
Post-op Day 1 (Missed visit)	Patient unable to attend follow-up due to family matters.	—
Week 2 (1st follow-up)	Clinical check-up, adjustment of prosthesis, suture removal.	No significant complaints; swelling reduced; patient reported anxiety about possible suture loosening. Healing uneventful.
Week 3 (2nd follow-up)	Further evaluation of soft tissue healing.	Patient reported increased comfort, able to chew and speak normally. Extraction sites healing well.
Week 4 (3rd follow-up)	Final short-term review.	Patient could chew slightly harder foods, felt normal function restored, expressed satisfaction with esthetic and functional outcomes.

**Figure 1. Patient's extra and intra oral photo (initial condition)****Figure 2. Panoramic Radiograph****Figure 3. 3D model comparison before and after surgery**

Due to the high mobility and frailty of the remaining abutments (canines and premolars), an intraoral scan (Runyes V3) was performed to safely capture the full-arch data and interocclusal relationship, mitigating the risk of inadvertent tooth extraction often associated with conventional impression trays.

The digital files were processed to simulate post-extraction arches, virtually removing hopeless teeth and generating predictive ridge contours. This simulation allowed evaluation of anterior esthetics, midline correction, and smile design, aiding both clinical planning and patient communication.

Despite digital planning, fabrication was performed conventionally for affordability and flexibility. Acrylic denture teeth were arranged in wax according to the digital simulation. A conventional acrylic immediate removable partial denture was fabricated with Gillet clasp retention on premolars.

At the surgical appointment, the hopeless teeth were extracted, and the prosthesis was inserted immediately, restoring esthetics, phonetics, and function while acting as a protective dressing.

Follow-ups were carried out at one week, two weeks, and three weeks. Adjustments were made to relieve sore spots, maintain occlusion, and monitor healing. The patient reported satisfaction with esthetics and regained self-confidence.

Discussion

The immediate restoration of the anterior zone is mandatory in such cases to prevent the esthetic and psychological trauma associated with an edentulous phase.^{2,4,6} This case utilized a hybrid approach, strategically combining the high precision of digital scanning with the proven accessibility of conventional laboratory fabrication. Critically, the use of the intraoral scanner proved essential in achieving clinical safety, as it eliminated the need for force application during impression making, thereby protecting the few remaining, highly compromised abutments from potential iatrogenic dislodgment.

A known limitation of the purely conventional immediate denture technique is the inability to conduct an anterior tooth try-in to verify esthetics and occlusal plane. In this hybrid protocol, the digital simulation of the post-extraction ridge provided a virtual mock-up for evaluating anterior esthetics, midline correction, and smile design prior to fabrication [figure 3](#). This step significantly enhanced the patient's acceptance and improved the predictability of the final esthetic outcome. The intraoral scanner played a critical role in preventing mechanical dislodgment of fragile teeth during impression making, while also capturing accurate occlusion. Digital simulation enhanced esthetic predictability and strengthened patient acceptance, addressing a known limitation of conventional immediate dentures, which lack anterior try-ins.^{7,9}

The decision to preserve the canines and



Figure 4. Post-surgical and insertion of removable immediate denture



Figure 5. Final Condition 3 weeks after insertion

premolars, utilizing them as abutments with Gillet clasps, was pivotal. This approach ensures superior stability and better load distribution, aligning with literature advocating for removable partial immediate dentures over complete immediate dentures when sufficient abutment teeth are available. Retention of premolars provided stability and improved load distribution, consistent with previous literature advocating partial rather than complete immediate dentures when possible.⁵ Psychologically, the immediate esthetic restoration was paramount for this young patient, successfully maintaining her social integration and self-confidence, a major concern in aggressive periodontitis cases.^{2,3}

A limitation of the immediate denture, regardless of the workflow, is the inevitable alveolar bone resorption following extraction, which necessitates periodic relining or eventual rebasing to maintain fit and stability. The patient was thoroughly educated regarding the necessity of continuous maintenance and the long-term plan for a definitive prosthetic solution, such as fixed partial dentures or dental implants, once healing process is complete.

Conclusion

This case successfully demonstrates that implementing a hybrid digital-conventional workflow is a viable and cost-effective solution for challenging immediate denture cases, particularly those complicated by aggressive periodontitis and limited, compromised abutments. The integration of intraoral scanning ensured clinical safety during data acquisition and significantly enhanced esthetic predictability through digital simulation. This approach resulted in the immediate restoration of esthetics, phonetics, and the patient's psychosocial well-being.

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