

CLINICAL REPORT

Staged extractions and implant placement in a periodontally compromised patient: A clinical report



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Providing a complete-arch, implant-supported rehabilitation can be challenging, and many factors should be considered before establishing a diagnosis and treatment plan.¹⁻³ One of the first factors should be analyzing the etiology of hopeless teeth.⁴ The treatment of active disease should be addressed before implant placement.^{5,6} Scaling and root planing, extraction of hopeless teeth, debridement of the socket, and delayed implant placement may be common options in these situations.⁷ This sequence of treatment may prevent cross infection between periodontally infected teeth and dental implants.⁸

After the stabilization of hard and soft tissues and before implant placement, the patient's tooth display at rest and during smiling should be examined in combination with upper lip support, length, and mobility.⁹ Calculating the amount of tooth display at rest and during smiling is an important step in determining the type of fixed prosthesis.^{10,11} Chiche and Pinault¹² have stated that maxillary central incisors should have a 75% to 80% width-to-length ratio to generate an esthetically pleasing smile. In patients who have less than 14 mm distance from the desirable incisal edge to the final implant head position, implant-supported fixed dental

ABSTRACT

Staging the extraction of selected teeth in a periodontally compromised patient during complete mouth rehabilitation has advantages, including avoiding a transitional complete denture, keeping the patient with a fixed prosthesis throughout the treatment without the need to immediately load the implants, maintaining the interdental papillae, and providing comfort for the patient. The need for a multistep extended treatment and additional cost are the main disadvantage of this approach. This clinical report describes the clinical steps and follow-up of a staging approach and implant placement in a periodontally compromised patient with excessive gingival display to achieve a good functional and esthetic result. (*J Prosthet Dent* 2019;121:206-11)

prostheses without gingiva-colored restorative material could be considered.^{13,14} However, when the distance is more than 14 mm, prostheses made with the addition of gingiva-colored restorative material play a significant role in creating pleasing proportions.^{15,16}

In such clinical situations, the highest position of the upper lip during a complete smile should be analyzed to avoid showing the interface between the pink ceramic and the gingiva.¹⁷ The type of prosthesis should be decided before implant placement because it affects the implant position and depth and the need for bone reduction.^{14,18,19}

Implant-supported fixed dental prostheses are challenging, and consideration should be given to the soft tissue architecture and gingival levels that could be exposed during smiling.²⁰⁻²² The extraction of multiple adjacent teeth could be a traumatic procedure for the soft and hard tissues, which may collapse.²³⁻²⁵ If the alveolar bone becomes flat and papillae are lost, the outcome of the rehabilitation may be poor.^{23,26}

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Staging the extraction of selected teeth, retaining strategic abutment teeth, and fabricating an interim restoration may improve the outcome.²² Patients with thin phenotypes react differently than those with thick phenotypes on extraction and implant placement.^{27,28} In patients with a thin phenotype, multiple soft tissue grafts might be indicated to achieve stable gingiva.^{27,28}

Fixed interim restorations provide patient comfort while maintaining the vertical dimension of occlusion and allow soft tissue management.^{5,22} Maintaining some abutment teeth will enable the clinician to fabricate a tooth-supported, radiographic, and surgical guide.²² The purpose of this clinical report was to describe the treatment of a patient using staged extractions and implants to achieve good functional and esthetic results.

CLINICAL REPORT

A 43-year-old woman presented to the Martinez-Benazet dental office hoping to improve her oral health, function, and esthetics. Her medical history was noncontributory. She had been a smoker (20 cigarettes/day) but stopped 5 years previously. The intraoral examination revealed endodontic treatment of the maxillary left first molar and the mandibular left and right first molars and composite resin restorations in some maxillary and mandibular teeth. Her plaque index was 35% and probing depths were as shown in [Figure 1](#).

Class III furcation defects were observed in the mandibular left and right first to third molars; there was 75% bone loss in the maxillary arch and the mandibular posterior teeth with class II mobility, 50% bone loss in the mandibular left and right second premolars with no mobility, and generalized bleeding upon probing. Radiographically, there was generalized bone loss and periapical radiolucencies, indicating active infection in the maxillary right first molar, maxillary left first molar, mandibular left first molar, and mandibular right first molar ([Fig. 2A](#)). Bilateral sinus pneumatization was present.

Esthetically, the patient had 5 mm of maxillary central incisor display at rest and 4 to 6 mm of gingival display during an exaggerated smile ([Fig. 2B](#)). Her gingival margins were not symmetrical. Functionally, she had generalized mild occlusal dysfunction, creating attrition. From an esthetic and functional perspective, she had a good prognosis. Biomechanically, dental caries and open margins were present on the maxillary right and left first molars and composite resin restorations on the mandibular left and right first molars; these teeth were not in occlusion and had a poor prognosis. She had generalized severe chronic periodontitis²⁶ with guarded prognosis for the mandibular left and right second premolars and a poor prognosis for all maxillary teeth and mandibular left and right first to third molars.

The initial therapy treated the active periodontal disease with scaling, root planing, and oral hygiene instruction

([Fig. 3](#)). Dental implants were planned, and the distance from the intended incisal edge to the implant head position was 13 mm. A fixed implant-supported prosthesis was planned, and all maxillary teeth and mandibular left and right first to third molars were to be extracted as these had a poor periodontal prognosis.

Maxillary right and left lateral incisors, maxillary right and left first premolars to right and left third molars, and mandibular left and right first to third molars were atraumatically extracted. Site development in the extraction areas was completed in conjunction with subepithelial connective soft tissue graft in the area of the maxillary right and left lateral incisors and maxillary right and left first and second premolars. The same day, a polymethyl methacrylate (New Outline; Anaxdent) maxillary interim restoration reinforced with a 0.20-mm metal wire (Patterson Stainless Steel Archwire; Patterson Dental Supply) was inserted from maxillary right and left second premolars.

Three months later, the interim restoration was duplicated and fabricated in a radiolucent material (acrylic infused with barium, Fluorescent X-ray barium sulphate; Acryline X-ray) for a tooth-supported radiographic guide. A cone beam computed tomography scan with radiographic guide was performed to evaluate the implant sites. The implants were placed using a tooth-supported surgical guide.

In the maxillary arch, the implants (Brånemark System Mk III RP 3.75×18 mm; Nobel Biocare) were placed in the right and left pterygoid fissures. NobelReplace Tapered RP Tri-Channel Connection 4.3×10 mm (Nobel Biocare) implants were placed in the area of maxillary right and left first premolars using a surgical guide and a flapless approach. Subepithelial soft tissue grafts were placed at the facial surfaces of maxillary right and left first premolar implants. Resorbable simple sutures (VICRYL, polyglactin 910; Johnson & Johnson) were used to stabilize the soft tissue graft. In the mandibular arch, NobelReplace Straight Tri-Channel Connection RP 4.3×10 mm (Nobel Biocare) implants were placed with a flapless approach using a surgical guide in the areas of mandibular left and right, first and second molars.

Three months later, a maxillary surgical guide and a complete-arch metal-reinforced interim restoration were fabricated. Maxillary right and left central incisors and canines were atraumatically extracted, and NobelReplace Tapered RP Tri-Channel Connection 4.3×13 mm implants (Nobel Biocare) were placed with a flapless approach in these areas using the surgical guide. Subepithelium soft tissue grafts from the patient's palate were used to gain tissue thickness on the facial aspect of the implants and on the facial aspect and over the ridge of the maxillary right and left lateral incisors. The implant-supported, complete-arch interim restoration was inserted and tightened on the posterior implants ([Fig. 4](#)).

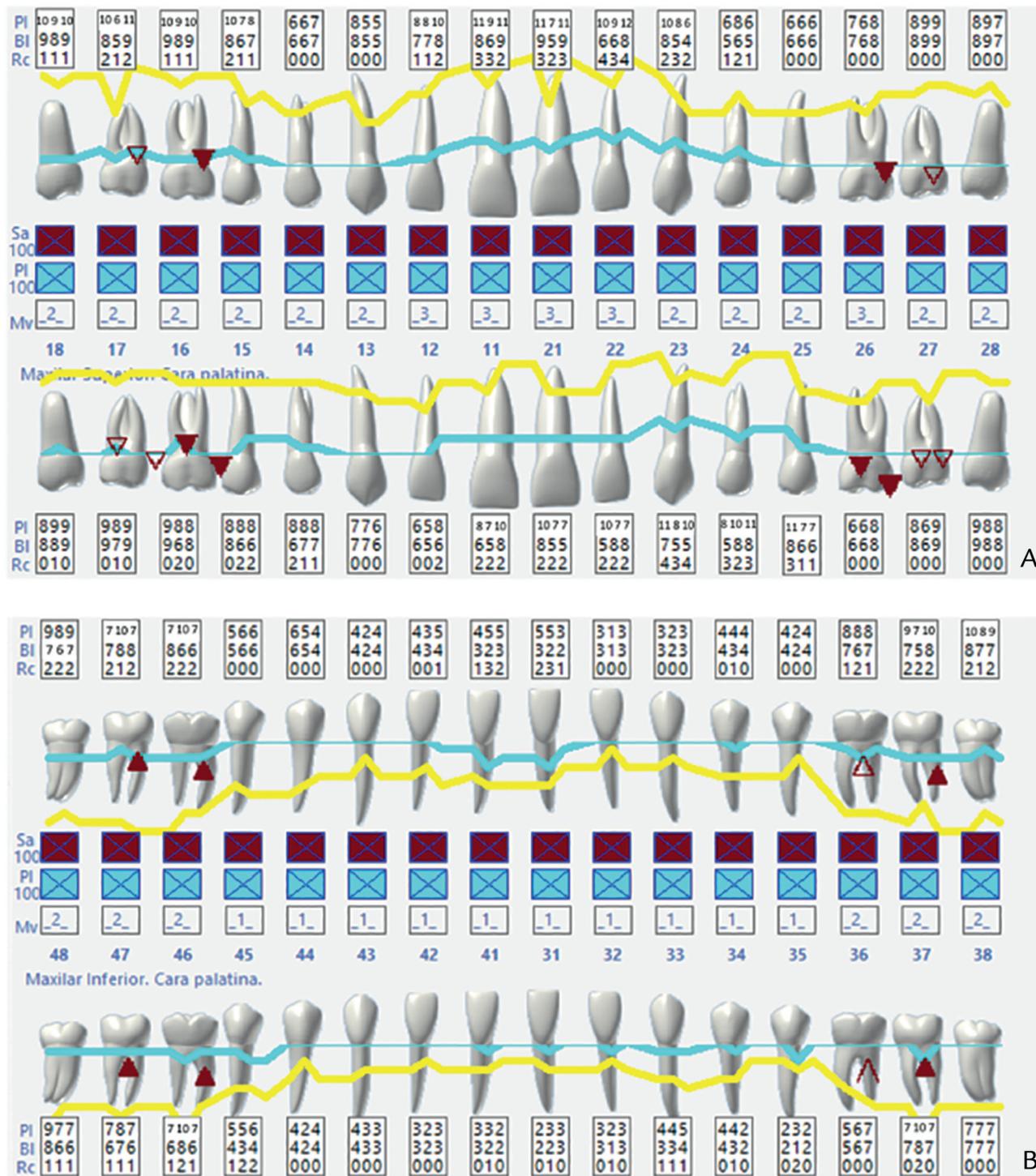


Figure 1. Periodontal charting. A, Maxillary. B, Mandibular.

Four months after implant placement, open-tray impressions of the maxillary and mandibular implants were made with autopolymerizing resin (Pattern Resin LS; GC Europe) to connect the implant impression copings, and an open custom tray was fabricated with acrylic resin (Triad TruTray, VLC custom tray material; Dentsply Sirona) and polyether adhesive (3M VPS Tray Adhesive;

3M ESPE). A soft polyether impression (Impregum; 3M ESPE) material was used.

The mandibular and maxillary posterior implants were restored with multiunit titanium abutment and computer-assisted design and computer-assisted manufacturing (CAD-CAM) cobalt-chromium framework (Createch Medical) with layered porcelain. The

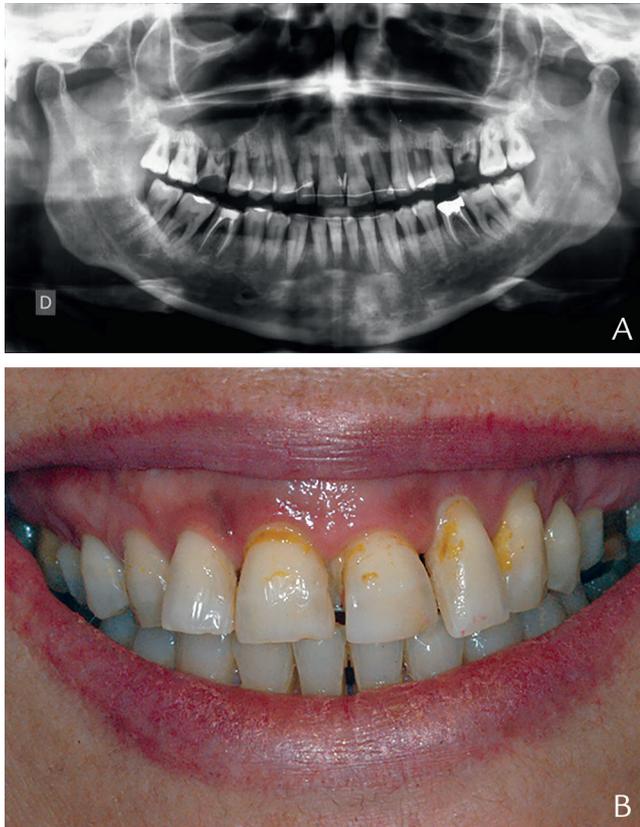


Figure 2. Pretreatment presentation. A, Panoramic radiograph. B, Extraoral image.

maxillary anterior implant-supported zirconia framework layered with feldspathic dental porcelain (Cerabien CZR; Kuraray Noritake Dental Inc) from the maxillary right and left central incisors to right and left canines was cemented using resin cement (Panavia SA Cement; Kuraray Noritake Dental Inc) (Fig. 5).

The occlusion was adjusted, and the patient was provided with a group function occlusal scheme, and a laboratory-processed occlusal device was fabricated. The treatment sequence is shown in Figure 6.

The patient was recalled every 6 months. At the 6-year recall appointment, the hard and soft tissues remained stable. Furthermore, the papillae from the maxillary right central and lateral incisors had filled in the space. The periodontal condition of the patient remained stable with no sign of inflammation or bleeding (Fig. 7).

DISCUSSION

Staged extractions are a valuable treatment for a periodontally susceptible patient. During this approach, periodontal disease should be treated, and the patient's oral hygiene should be monitored before and after implant placement. Otherwise, cross infection is likely to occur.⁸ This clinical report has demonstrated that the distance from the final incisal edge to final implant head



Figure 3. Intraoral view after periodontal treatment.



Figure 4. Intraoral view of implant-supported interim restoration using maxillary pterygoid and first premolar implants and soft tissue grafts.



Figure 5. Extraoral view after treatment.

position is important for determining the correct type of prosthesis. One of the advantages of this approach is providing the patient with a fixed interim prosthesis throughout the treatment without the need to immediately load the implants and with the possibility of managing and modifying the interdental papillae. The patient was comfortable while waiting for the bone and soft tissue graft and implant osseointegration. The need for a bone graft and multiple soft tissue grafts around the implants to compensate for the future loss of buccal plate thickness has been described.^{29,30} Furthermore, when the



Figure 6. Treatment sequence.

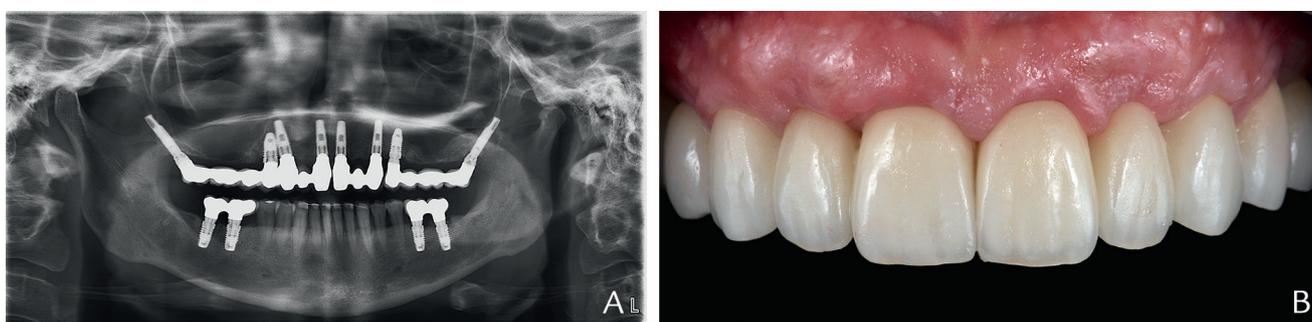


Figure 7. Six-year recall appointment. A, Panoramic radiograph. B, Intraoral view.

patient has a thin phenotype, they tend toward midfacial recession and papillary height loss if immediate implants are placed.³¹ Maintaining strategic teeth will help to minimize the trauma, and the bundle bone will be temporarily preserved so that additional blood supply can be provided during implant osseointegration.²³ At the same time, a flapless approach may minimize the trauma without compromising the blood supply from the periosteum.²⁶ From a restorative perspective, zirconia abutments were used in the anterior implants to improve the esthetics because the patient had a thin, soft tissue phenotype and zirconia may retain less plaque than titanium.²⁸ A CAD-CAM cobalt-chromium framework was the material of choice for the posterior implants because of its strength and precision.¹⁵

The need for a multistep, long treatment, length of time, potential for multiple hard- and soft-graft surgeries because pink prosthetics are typically not used, patient acceptance, and additional cost are the main disadvantages of this approach. This approach is not applicable in all patients because sound strategic abutment teeth are needed. At the 2-year recall, the papilla had filled the interproximal space between the maxillary right central and lateral incisors. When the distance from the contact area to the underlying bone is less than 5.5 mm from an implant to a pontic, the papilla will tend to fill the space,

even if there is no papilla after 1 month of insertion of the prosthesis.^{23,26}

SUMMARY

Staged extractions are a valuable treatment for a periodontally susceptible patient. This approach provides esthetics and comfort and improves the success of implant restorations for selected patients. Different factors, including analyzing the etiology of hopeless teeth and the situation of the strategic abutment teeth, should be considered before establishing a diagnosis and treatment plan.

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