

## AN INTERDISCIPLINARY SOLUTION TO A COMPLEX PERIODONTAL CASE

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In most developed countries of the world, the dental IQ of the average patient has changed considerably in the last decades, as society has become more health conscious. People are living longer in a youth-oriented society, and patients expect dental solutions where not only function is restored, but health, aesthetics, and self-esteem as well.

Dentistry itself has evolved from the aggressive and resective procedures of the past which, by contemporary standards, could often be classified as imprecise and invasive. There is ample evidence today that periodontal disease can be arrested in the majority of instances, and that teeth—with proper maintenance—can be maintained for many years in health, function, and comfort, even when severely affected.<sup>1,2</sup> The etiology of periodontitis and the role of the known risk factors are much better understood. Innovative surgical approaches that maintain a biological basis allow periodontists to regain support and restore tissue in affected areas. Additionally,

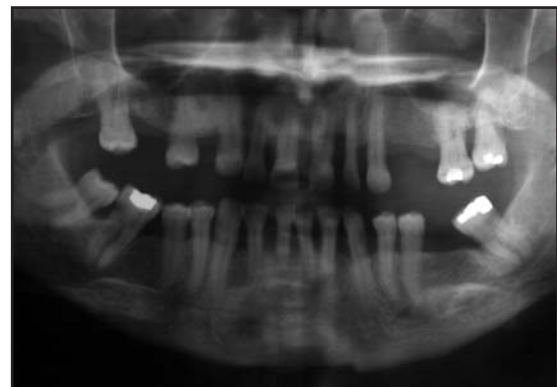
the development and success of osseointegrated implants have permitted their incorporation into routine practice, facilitating the restorative aspects of treatment.

To address the increasing aesthetic expectations of today's patient, however, the clinician should consider moderate-to-severe periodontitis more frequently, and envision its relationship to the desired outcome—particularly in the aesthetic zone. Hence, orthodontics must be included in the treatment plan. Once primarily associated with adolescent patients, orthodontic treatment has become common among a significant proportion of adults.<sup>3,6</sup>

Consequently, dentistry needs to develop an interdisciplinary approach to treatment for such cases. Since it is challenging for one individual to master the various facets of therapy required to achieve excellence, the contemporary dental team should include specialists as well as auxiliaries with similar philosophies and skills.<sup>7,8</sup> All should be convinced of the rationale and



**Figure 1.** Preoperative facial view shows presence of periodontal disease and malocclusion with formation of diastemata.



**Figure 2.** Panoramic radiograph demonstrates severe bone loss and tooth malposition.



**Figure 3.** Diagnostic setup indicating the future position of the teeth and restorations.

objectives of the interdisciplinary approach and be able to convey to the patient the benefits of embarking on a comprehensive, extensive, time consuming, and at times, expensive treatment. Once completed, satisfaction with the results achieved, an improved self-esteem, and a positive social response will be worthwhile rewards for the patient.

The following case report illustrates treatment performed, with the cooperation of different specialists, on a female patient with advanced periodontal disease and severe malocclusion.

## Case Presentation

### Diagnostic Phase

A 48-year-old female patient presented for consultation regarding her dental health. The patient, who was a non-smoker in excellent systemic health, hoped to retain some of her teeth. In two previous consultations, she was advised to extract all of her teeth and replace them with implant-supported overdentures. The patient's dental history indicated she had never received dental treatment, except for extractions. Clinical examination revealed severe malocclusion, with tooth migration and malposition, diastemata, and the collapse of vertical dimension as a consequence of extractions performed 10 years previously (Figure 1). Her oral hygiene habits were deficient, and periodontal examination revealed moderate-to-deep pockets and loss of clinical attachment. The deepest involvement affected the maxillary anterior teeth



**Figure 4.** Following orthodontic treatment, the diastemata were nearly closed.



**Figure 5.** Metal-ceramic restorations were seated on the implants. Periodontal surgery was performed on the maxillary left implants to improve their gingival contour.



**Figure 6.** Aesthetic gingival recontouring was performed on the maxillary central incisors.

and the molars, where furcation defects were detected. This resulted in a diagnosis of generalized moderate and localized advanced chronic periodontitis (Figure 2). Loss of attachment ranged from 2 mm to 10 mm; 72% of



**Figure 7.** At the maintenance visit following surgery, the condition of the gingival tissues was evaluated.



**Figure 8.** Panoramic radiograph prior to veneer placement shows the improvement of the alveolar bone around the teeth and implants.



**Figure 9.** A waxup of the porcelain laminate veneers was performed in the dental laboratory.

the pockets were 4 mm or deeper and 43% were at least 6 mm in depth. Nearly half (48%) of the teeth had grade 1 mobility, 26% had grade 2 mobility, and the remaining 26% had no mobility.



**Figure 10.** Provisional restorations were fabricated from acrylic resin and seated in place.

Upon complete and comprehensive analysis, a multidisciplinary treatment was offered to the patient. A waxup remount was performed to determine the position the teeth would have following orthodontic therapy, the shape and size of the definitive fixed prosthesis, and the location of the implants that would support the reconstruction (Figure 3).<sup>9</sup>

#### **Treatment Protocol**

The first phase of therapy was periodontal treatment, which included periodontal debridement (ie, scaling and root planing) of the entire dentition as well as oral hygiene instruction. After reevaluation, 34% of the sites still showed bleeding upon probing, and mucoperiosteal flaps were raised in the four quadrants. Once the supportive phase of periodontal therapy was underway and the patient demonstrated hygiene compliance and stable results, the orthodontic treatment was initiated.

Implants were inserted at this stage to provide, upon osseointegration, anchorage that would permit activation of the orthodontic appliances (Figure 4). The diastemata in the mandibular anterior region were closed by mesializing the teeth from premolar to premolar, which would maintain the inclination and position of the mandibular incisors. In this way, her facial profile was not altered. To replace tooth #30(46) with an implant, where no space was available, the anterior diastemata were increased by stripping. Hence, the mesialization of the premolars was increased and, at the same



**Figure 11.** Preparation was completed for the feldspathic veneers. Note the wear of the provisional restorations and teeth.



**Figure 13.** Postoperative view of the veneers following cementation. The papillae are filling the interdental space. Minor inflammation is still present.

time, a better interradicular distance was achieved among the remaining teeth. The diastemata in the maxillary anterior region were closed through retrusion of the teeth, since they were in an excessively protruded position. These movements were performed over a period of approximately nine months. They generated a minimal increase in the vertical dimension of occlusion and created additional space where the remaining implants were to be installed. All the implants placed were 3.75 mm or 4 mm in width, 10 mm to 15 mm in length, and featured a sandblasted, acid-etched surface. The orthodontic appliances were removed approximately 10 months thereafter.

During treatment, provisional restorations were placed to maintain not only aesthetics but also to provide healthy gingival contours and function. These provisional



**Figure 12.** View of the definitive feldspathic veneers on the laboratory model prior to try-in and cementation.



**Figure 14.** Facial view at completion of treatment demonstrates gingival contours obtained and the occlusal relationships achieved.

restorations were later replaced by definitive implant-supported metal-ceramic restorations. Previously, a subepithelial connective tissue graft was placed at the site of the maxillary left implants to correct a gingival margin defect. Black triangles, however, remained (Figure 5).<sup>10</sup>

Satisfied with the results achieved, the patient requested further treatment to improve her dental aesthetics. Periodontal plastic surgery was performed to correct the uneven gingival contour affecting the maxillary anterior teeth (Figure 6). The condition of the gingival tissue and alveolar bone was evaluated (Figures 7 and 8), and direct composite veneers were placed on the mandibular anterior teeth. The maxillary anterior would be restored with feldspathic veneers to achieve optimal aesthetics. A diagnostic waxup for these porcelain laminate veneers was created in the laboratory. This waxup would guide tooth





**Figure 15.** Right lateral view of the definitive implant restorations and healthy periodontal tissues.



**Figure 16.** Postoperative left lateral view. The subepithelial connective tissue graft placed on the implants is still maturing and shows "creeping attachment."

preparation and aid in the fabrication of two sets of provisional restorations needed to achieve the patient's aesthetic goals (Figures 9 through 11). Following the blueprint provided by the provisional restorations, the definitive feldspathic veneers were fabricated and cemented in place (Figures 12 and 13).<sup>11</sup>

#### **Patient Recall**

Six years following the initial periodontal examination, only 7% of the pockets remained 6 mm or deeper, with total absence of bleeding upon probing. Eighty percent of the periodontal pockets measured less than 4 mm in depth. Seventy-five percent of the pockets had reduced, 4% had not changed, and 1% showed a minor increase in depth. While furcations were still present, 97% of the teeth had no mobility, and 3% had a mobility of grade 1. The patient continued to demonstrate excellent compliance with her oral hygiene regimen (Figures 14 through 16).

#### **Conclusion**

This extensive and comprehensive multidisciplinary treatment has permitted the resolution of a severely compromised patient with a conservative approach. All of the patient's teeth were maintained, and the health of the remaining periodontium was preserved. The patient was pleased with the aesthetics achieved and thankful for the services provided by the members of the restorative team. She continues to be diligent in a routine maintenance program that controls all the aspects of

the treatment rendered. Function, stability, and aesthetics have been achieved, and the patient's self-esteem has been reaffirmed.

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