Achieving Longevity in Esthetic Dentistry by the Proper Diagnosis and Management of Occlusal Disease

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Abstract

By using a methodic diagnosis system, such as the Dento-Facial Esthetic Diagnosis System, excellent esthetic results and patient satisfaction can be achieved. Before any case is started, it is important to properly diagnose the etiology of the condition needing the esthetic treatment or rehabilitation. It is important to properly diagnose and manage occlusal disease because it often results in a shorter life for restorations. Occlusal disease is responsible for unnaturally severe tooth wear and fractured restorations, which cost millions to repair. It is also responsible for many undiagnosed and untreated migraines, temporomandibular dysfunction, and secondary occlusal trauma, which amplifies periodontal destruction and ultimately speeds up tooth loss. For this reason it is paramount that we properly diagnose and manage occlusal disease before we start any esthetic treatment.

Learning Objectives

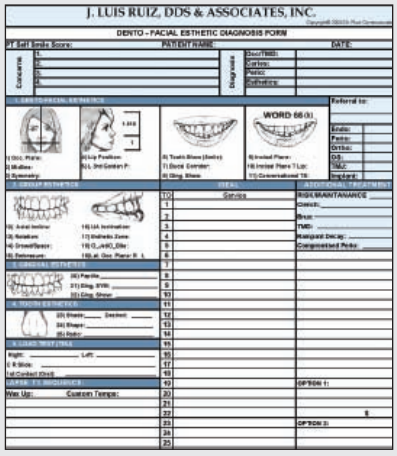
After reading this article, the reader should be able to:

- explain the benefits of properly diagnosing the etiology of the condition needing the esthetic treatment, before the treatment phase starts.
- describe the benefit of naming the problems associated with occlusal disease.
- identify a new methodic data gathering system: the Dento-Facial Esthetic Diagnosis System.

To satisfy our patients' high esthetic expectations, and to ensure predictable long-term results, it is necessary to perform a dento-facial diagnosis and to have clear communication with the patient before beginning the case.[1,2] The Dento-Facial Esthetic Diagnosis (DFED) System, developed by the author, uses a series of dental records and forms to give the dentist the ability to methodically record the patient's goals, personality, preferences, and conditions and then blend them with the clinical findings and the 25 parameters of dentofacial esthetic design.[3,4] This systematic approach also includes the proper diagnosis of the etiology of the unesthetic condition needing repair (Figure 1). No case should ever be started without first having diagnosed the etiology of the problem to be treated, because if we understand the cause, it becomes easier to educate the patient on how to minimize or prevent the re-occurrence of the problem and increase the longevity of our restorative work. For example if the esthetic rehabilitation is the result of rapidly progressing, rampant decay (Figures 2 and 3), we can educate the patient about the problem, counsel him or her to manage or modify diet and/or sugar intake, and place the patient on a regimen to include fluoride trays and proper oral hygiene. Similar actions should be taken if the etiology is periodontal disease or occlusal disease. Whenever we consider any esthetic treatment or oral rehabilitation, we should also consider using this systematic approach.

Occlusal Disease

One of the major reasons why an esthetic rehabilitation may have a short life is occlusal disease. The definition of disease is an abnormal condition of an organism as a consequence of infection, inherent weakness, or environmental stress that impairs normal physiological function.[5] Occlusal disease fits that definition perfectly. Millions of dollars are spent every year to treat cervical erosions and hypersensitivity, which is rarely recognized as occlusal disease. Severe cervical hypersensitivity and cervical erosions of the teeth (abfractions) are often treated with restorations without properly attributing this damage to occlusal disease. Evidence points to the fact that occlusal trauma (one form of occlusal disease) is often the primary cause of hypersensitivity and severe pain.[6] Millions of Class 5 restorations are performed every year to treat cervical abfractions without properly diagnos-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DENTO - FACIAL ESTHETIC DIAGNOSIS FORM

Figure 1—DFED form requires a diagnosis to follow with a preventative regimen based on the etiology of the condition.

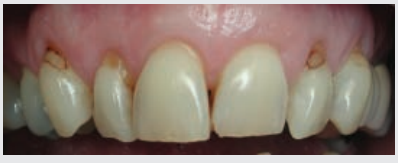

Figure 2—Patient who wanted esthetic restorations has rapidly progressing uncontrolled caries.

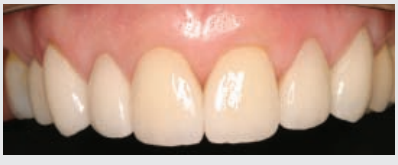

Figure 3—A 4-year follow-up picture showing excellent health and caries control.

ing or treating the cause of the problem—occlusal disease. Clinical experience and evidence points to a link between this cervical lesion and occlusal trauma.[7-10]

On a daily basis, patients come to the dental office seeking treatment for damage to their dentition caused by occlusal disease, but the patient and even the dental professional rarely identify the true enemy. Direct and indirect restorations can fracture and have to be repaired or replaced at great financial cost as a consequence of occlusal disease and often the etiology goes unrecognized. Studies also point out that rapidly progressing localized periodontal destruction, mobility, and early tooth loss can be attributed to occlusal disease (occlusal trauma).[11] Muscle pain and temporomandibular dysfunction (TMD) are other signs and symptoms of occlusal disease that go unrecognized and untreated.[12,13]

Dentists treat occlusal disease everyday, but it is usually not diagnosed as such. For this reason, patients do not see occlusion conditions as threats to their dental health or as a disease needing attention—they see it as a process of wear and aging. Calling these occlusal conditions occlusal disease would bring more urgency to the condition and would help patients understand that it is not aging or natural wear, but rather a serious disease that requires treatment.

Clinical Applications

Patients often present to the dental office with unesthetic dentition that they wish to have corrected quickly and with the least amount of complication possible. Sometimes, in a rush to provide patients with what they want, dentists may overlook comprehensively diagnosing the etiology behind the unesthetic condition.

The price of overlooking the diagnosis phase and not educating the patient can be high, as shown in Figure 4. This patient reported having had "notches" on her teeth and gum recession. Veneers were placed 7 years before. The patient reported not having had any explanation about the source of the problem and never received an occlusal splint or bite equilibration. Only a couple of years after treatment did more recession occur, and new "notches" with stains started to form.

Occlusal disease is one of the main reasons for a restoration's short clinical life. The patient in Figure 5 presented with the desire to improve esthetics and repair existing damage to his teeth. Instead of quickly moving into the treatment phase, the patient was informed of the importance of proper diagnosis and occlusal evaluation using the DFED System. To perform a dentofacial evaluation, it is imperative to have the appropriate records, which must be of excellent quality. The records included a full set of periapical x-rays, a panoramic x-ray, 6-point periodontal charting, casts mounted on a semi-adjustable articulator (Panadent) with specific esthetic features mounted using the Kois face bow (Panadent), and a set of 11 digital photographic views including a key view "conversational tooth reveal."[14]

The DFED form (Figure 6) uses drawings of the photographs to systematically organize and asses the 25 parameters of dentofacial esthetics.[15-19] An important part of this system is the assessment or diagnosis of the etiology of the condition, which leads to the "risk/maintenance" box and to the management of the risk before the treatment is started (Figure 6). (The reader may develop a form similar to the one described in this article, or may contact the author for a

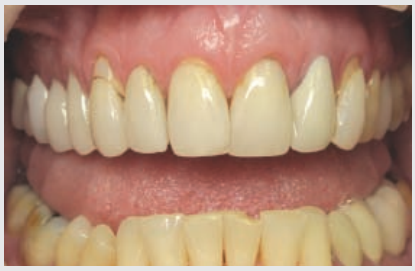

Figure 4—The patient reported having recession and staining of the gingival margins within a few years after the veneers where placed.

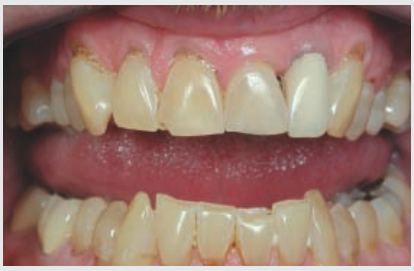

Figure 5—The patient desired esthetic rehabilitation. Observe the damage on teeth consistent with a diagnosis of occlusal disease (restricted envelop of function).

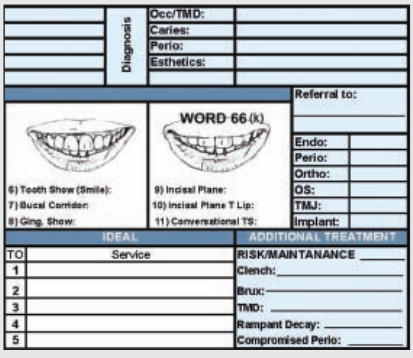

Figure 6—The DFED form has a window on the upper right side that requires a diagnosis with the box below requiring an assessment of the risks/maintenance.

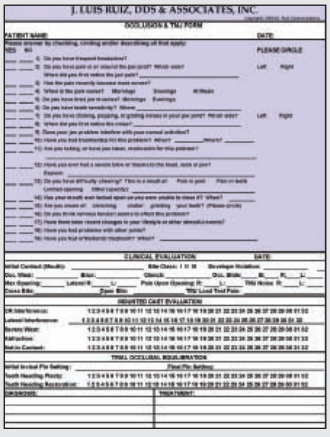

Figure 7—The occlusion and TMJ form should be filled out whenever occlusal disease is the etiology.

complimentary copy). If the risk is related to occlusal disease, the system requires the use of the Occlusion and TMJ (temporomandibular joint) form (Figure 7), which helps guide the clinician through an efficient and complete clinical occlusal evaluation to allow for further diagnosis and management.

After the full DFED, the patient was re-appointed for a final treatment presentation and explanation of the results. By using the photographs and mounted cast, it is easier to explain the signs and symptoms of occlusal disease—clenching and obstructed envelop of function[20] (Figure 8). A treatment was recommended that included occlusal equilibration, periodic occlusal adjustments, and an occlusal guard.

When the patient understands that the damage to his or her teeth is not a result of aging or natural wear, the dentist may be able to manage complex cases more predictability. Even if more fragile, tooth conserving esthetic restorative materials, such as porcelain, are used excellent longevity can be expected.[21,22]

Figures 9 through 11 show a 7-year follow up of a patient who presented with severely worn teeth as a result of bruxism. Before the treatment was started, the patient was educated about occlusal disease and the consequences this condition can have on restorations. When deciding which restorative materials to use, a choice was given between bonded porcelain onlays or full-coverage, porcelain-fused-to-metal (PFM) crowns. The patient chose to have the porcelain onlays, hoping to increase the longevity of the tooth by avoiding the excessive tooth drilling needed for PFM crowns, (even if the longevity of the restoration themselves may be shorter).

The patient was equilibrated and then treated with a full-mouth rehabilitation using bonded porcelain onlays and veneers with minimal tooth preparation, even in the most distal teeth. The patient also received periodic occlusal equilibrations and was given an occlusal splint. Although this patient was a bruxer, with proper diagnosis and management of his occlusal disease, 7 years after placement, the restorations look great. The teeth and surrounding structures are very healthy, and the long-term prognosis is good (Figure 9).

Conclusion

Esthetic rehabilitations are very rewarding and desirable for patients as excellent results and longevity can be achieved by using proper diagnosis. The DFED System makes patient satisfaction predictable by prompting a methodical recording of the patient's goals, personality, preferences, and conditions allowing for excellent results.

The signs and symptoms of occlusal disease are evident early in

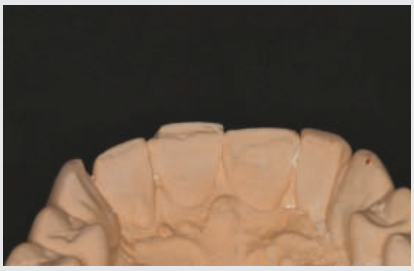

Figure 8—Casts are very useful for educating patients. The severe wear on the linguals of teeth Nos. 8 and 9 is visible to the patient and creates a sense of impact and urgency.

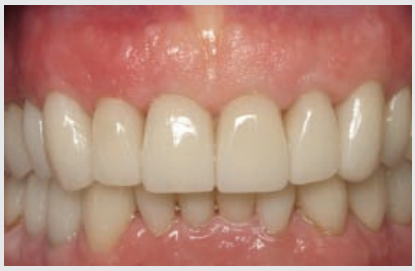

Figure 9—In contrast to Figure 4, observe a 7-year rehabilitation case of a severe bruxer. By properly managing occlusal disease, excellent longevity and prognosis can be attained.

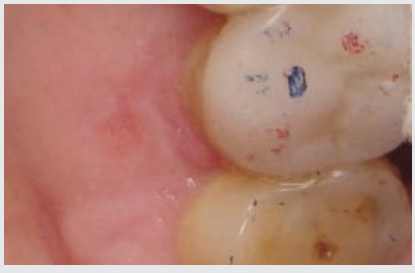

Figure 10—Occlusal view of tooth No. 16 showing the severity of occlusal wear and bruxism present before the rehabilitation 7 years previously. Photo was taken during a periodic occlusal adjustment.

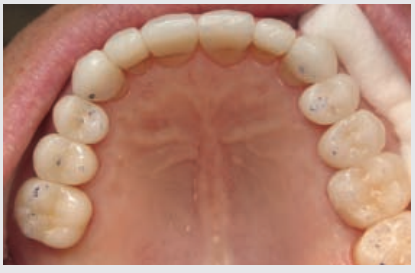

Figure 11—Image taken during periodic occlusal equilibration 7 years after treatment.

life; however, they usually go undiagnosed and untreated until damage occurs. The dental professional must educate the patient about this problem before rehabilitation is started. Clinicians fight an uphill battle to educate and motivate patients. The dental profession would do well to call such occlusal conditions "occlusal disease," thus bringing more urgency to the condition. Patients will also understand that occlusal disease is not a result of aging or natural wear, but a serious disease that requires treatment and maintenance.

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Product References

Products: semi-adjustable articulator, Kois face bow
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1. **How many parameters of dentofacial esthetic design are there?**
   a. 5
   b. 15
   c. 25
   d. 35

2. **No case should ever be started without:**
   a. first having diagnosed the etiology of the problem to be treated.
   b. a physician's supervision of any medical conditions.
   c. at least a 10-year patient history.
   d. at least a 20-year patient history.

3. **Disease is an abnormal condition of an organism as a consequence of:**
   a. infection.
   b. inherent weakness.
   c. environmental stress.
   d. all of the above.

4. **Patients see occlusion conditions as:**
   a. a dental professional conspiracy.
   b. a threat to their dental health.
   c. disease needing attention.
   d. a process of wear and aging.

5. **To perform a dentofacial evaluation, it is indispensable to have:**
   a. appropriate records.
   b. an assistant.
   c. cone beam computed tomography (CT) scan of the patient.
   d. all previous radiographs after permanent tooth eruptions.

6. **The DFED system uses a set of how many digital photographic views?**
   a. 2
   b. 3
   c. 11
   d. 25

7. **This system uses an assessment or diagnosis of the etiology of the condition which leads to:**
   a. the "risk/maintenance" box.
   b. cause/effect of the disease process.
   c. cause/effect of the host response.
   d. standard of care patient/procedural groupings.

8. **What are some of the symptoms of occlusal disease?**
   a. bruxing and tooth discoloration
   b. myofacial pain and clicking
   c. rampant caries and gingivitis
   d. clenching and obstructed envelop of function

9. **Excellent results and longevity can achieved by:**
   a. having a thorough patient history since birth.
   b. setting a proper fee structure.
   c. using proper diagnosis.
   d. having well-trained ancillary staff.

10. **The dental professional would do well to call such occlusal conditions "occlusal disease" because doing so would:**
    a. bring more urgency to the condition.
    b. justify to the patients the need for a procedure.
    c. allow for proper diagnosis of the etiology.
    d. bring dentistry in line with international standards.

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2.	a	b	c	d	**7.**	a	b	c	d
3.	a	b	c	d	**8.**	a	b	c	d
4.	a	b	c	d	**9.**	a	b	c	d
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