

SIGNIFICANT SCIENCE MAGNIFICENT ART

Aesthetics



Volume III



THE AMERICAN ACADEMY OF COSMETIC DENTISTRY MONOGRAPH

Clinical and Laboratory Applications of Dawson's Philosophies and Techniques

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The purpose of this article is to show the systematic process through which the restorative team carries out comprehensive restorative dentistry with both success and predictability. Included in this presentation are scientifically supported concepts of vertical dimension of occlusion, centric relation, concepts for equilibrium of the masticatory system, and case studies that demonstrate the interplay that is needed between the members of the restorative team in order to achieve success.

Today's patients arrive at a dental office expecting to receive aesthetic treatment that will help them in their personal and/or professional lives. It is assumed by patients that there is a seamless process that provides their final dentistry. The patient is not aware of and/or certainly not knowledgeable of the intricate, successful communication that must occur between the dental office and the dental laboratory in order to provide the dentistry that not only fulfills his or her aesthetic objectives but also has the capacity to be anatomically and functionally sound. This article shows the systematic process through which the restorative team carries out comprehensive restorative dentistry with success and predictability. This presentation demonstrates concepts of vertical dimension of occlusion, centric relation, concepts for equilibrium of the masticatory system, and case studies demonstrating the necessary interplay.

To provide comprehensive restorative treatment for a patient, there must be a consensual philosophy and a process of communication that allows the dental office and the dental laboratory to achieve repetitive success. Because of the aesthetic demands placed on the restorative team by today's patient, a great deal of the process requires the clinician and dental technician to determine the shape, size, and shade of the teeth and how they fit a patient's face. For a satisfied patient, one *must*

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FIGURE 1. For optimal results, a case is completed in wax, acrylic, and porcelain.

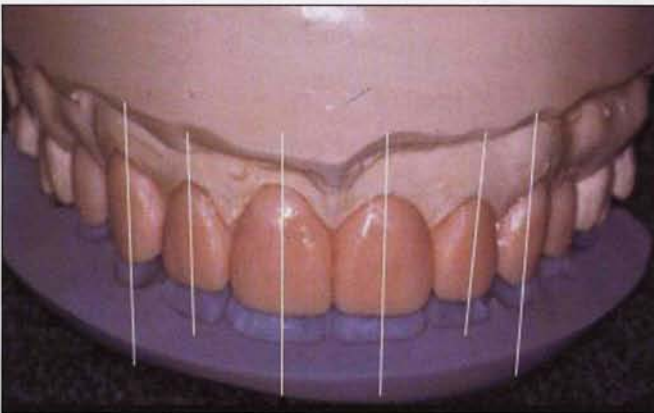


FIGURE 2. Example of three-dimensional case communication between the restorative dentist and orthodontist.

fulfill the patient's aesthetic objectives. This cannot be accomplished unless the restorative team utilizes sound philosophical concepts to create the synergy between aesthetics and function that is necessary to allow a case to feel natural and ensure its longevity.

THREE-DIMENSIONAL COMMUNICATION

Contemporary dentists would like to take credit for creating processes for the evolution of the aesthetic case. In order to have success with the comprehensive restorative case, the restorative team should complete the case a minimum of three times: the first time in wax, the second time in acrylic, and the third time in the restorative material of choice (Figure 1).¹ The authors utilize this concept extensively for three-dimensional communication

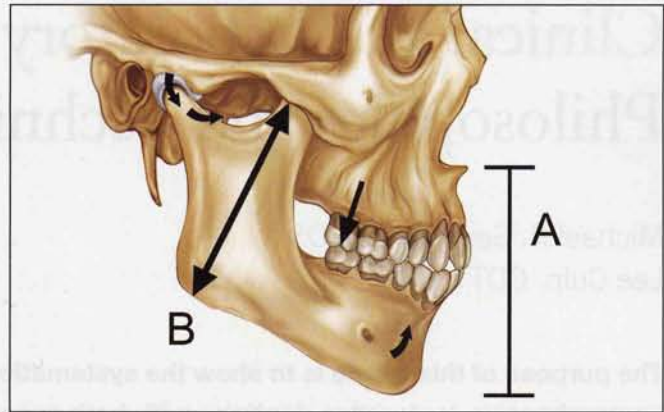


FIGURE 3. Illustration of patient in MIP in concert with a forward condylar position.

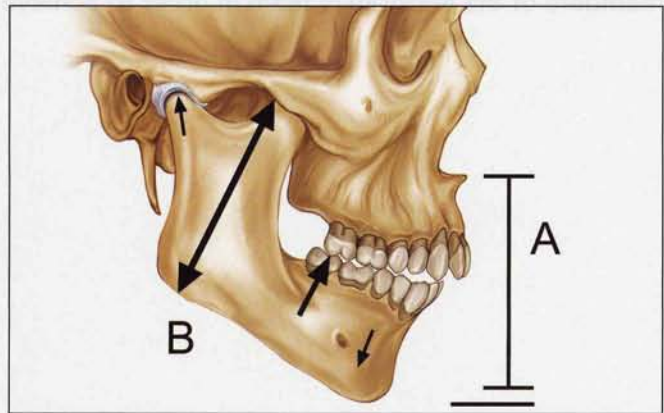


FIGURE 4. Illustration of mandibular position after the condyle finds centric relation, resulting in anterior open bite.

and verification between the patient, the dental office, and the dental laboratory. In addition, the clinician sends a cast of the diagnostic waxup and laboratory putty guides to other specialists (eg, orthodontists, periodontists) when needed for succinct three-dimensional communication (Figure 2).

VERTICAL DIMENSION OF OCCLUSION AND ACHIEVING CENTRIC RELATION

Of particular importance for restoration of the comprehensive case is an understanding of the patient's vertical dimension of occlusion (VDO). Proper assessment is essential in order to arrive at the right diagnosis. Knowledge of how the VDO is physiologically determined and altered in life is of paramount importance



FIGURE 5. Prerestorative smile image showing tetracycline staining and anterior wear.



FIGURE 6. Postrestorative smile image showing fulfillment of patient's aesthetic objectives.

for the clinician performing extensive restorative dentistry. Essentially, the VDO is represented by a dimensional equilibrium established between the maxillary and mandibular segments through the dynamic balance of equality that exists between the contracted length of the elevator muscles, most notably the masseters and the alveolar processes of the dental arches.¹

Case Presentation

A case study illustrates that knowledgeable practitioners can change a patient's facial features while still maintaining a physiologically sound masticatory system, without indiscriminate opening of the VDO. Alteration of this patient's dentition to harmonize with properly seated condyles in centric relation allowed for the opening of the patient's anterior occlusion,



FIGURE 7. The clinician performs bimanual manipulation on a patient to observe centric relation occlusion.



FIGURE 8. Prerestorative smile image of patient with multiple aesthetic and functional concerns.

creating the space necessary for the patient's new aesthetic restorations after judicious equilibration of the patient's posterior teeth (Figures 3 and 4). The case clearly illustrates that a dental professional can implement dental changes that improve a person's facial features without the need to open his or her VDO (Figures 5 and 6), thereby maintaining the patient's masticatory equilibrium.

Centric relation (CR) is defined as the relationship of the mandible to the maxilla when the properly aligned condyle/disk assemblies are in their most superior position against the eminentiae, irrespective of the VDO or of the tooth relationship (eg, whether or not the maxillary and mandibular teeth are in occlusion). At the most superior position, the condyles are braced medially.¹ The authors confirm the validity of CR as a measurable,





FIGURE 9. Postrestorative smile image showing results of aesthetic and functional treatment.



FIGURE 11. View after recapture of anteriorly displaced disc and restoration of proper condylar position.



FIGURE 10. Retracted view of patient showing adaptive malocclusion from intra-articular disorder.



FIGURE 12. Postrestorative image showing the restored cuspid-rise anterior guidance with lateral mandibular movements.

repeatable starting point for any dental work between the dental office and the laboratory. They emphasize that CR is a physiologically dynamic position where the muscles of mastication are at their working length, in a contracted state and, if recorded, would obviously have positive electromyogram (EMG) readings. Although there is a learning curve, the restorative dentist has found Dawson's bimanual manipulation technique (Figure 7) to be an effective clinical technique with a vast majority of his patients, and finds it to be an easy, repeatable method consistent with the findings of McKee.²

EQUILIBRIUM OF THE MASTICATORY SYSTEM

A practitioner must always acknowledge the existence of five basic components that make up the equilibrium

of the masticatory system (Table). It is critical to understand that any change to one of the components of the masticatory system affects all of its other components,¹ so much so that a significant imbalance of equilibrium can occur that could exacerbate detrimental effects in multiple areas of the system. At the recent AACD Scientific Session in Nashville, Tennessee, the authors presented an interdisciplinary case study, evaluating the equilibrium of various parts of a patient's dentition and their influence on the treatment plan for that patient (Figures 8 and 9).

SEQUENCING THE COMPREHENSIVE RESTORATIVE CASE

The lecturers showed a comprehensive case study of a 46-year-old female who presented for aesthetic dental



FIGURE 13. Postrestorative images showing the restored cuspid-rise anterior guidance with lateral mandibular movements.

treatment. A series of practical, systematic processes which were designed for the diagnosis of the case, constructive treatment planning, and effective treatment by both the dentist and the laboratory technician were demonstrated. The authors detailed how a patient with extenuating physical disabilities (ie, adaptive malocclusion, secondary intra-articular disorder) from a prior trauma could be properly treated in order to fulfill the patient's aesthetic objectives (Figures 10 through 14).

Extensive photographic documentation of the case was completed, including video of successive Doppler recordings so that the effects that were created by each step in the process, whether it was for aesthetic or functional purposes, could be seen. He utilized this case to show the extensive role he must assume as a codiagnostician if the ultimate treatment is to be realized. His segments illustrated the involvement of the laboratory

Table. Equilibrium of the Masticatory System

- Orthopedically stable TMJs;
- Anterior guidance in harmony with the mandibular function;
- Noninterfering posterior teeth in mandibular movements;
- All teeth in vertical harmony with the contacted length of the elevator muscles; and
- All teeth in horizontal harmony with neutral zone.



FIGURE 14. Accuracy of the restorations in protrusive movement demonstrated excellent communication.

technician, from analysis of the patient's premodels to fabrication of the ultimate diagnostic waxup that will serve as the prototype for the provisional restorations and, ultimately, the porcelain restorations. He also injected his thoughts on the current state of anterior and posterior aesthetic materials and where professionals will be going in the future in regards to their properties and how they would be fabricated. Included in his material segment was the significant role that CAD/CAM will play in fabricating the dental restorations of tomorrow, as well as how porcelain materials are evolving to complement the revolution seen in fabrication techniques.

CONCLUSION

Form and function are interdependent. Complete dentistry is performed through comprehensive examination and evaluation, application of definitive rules of science that are drawn from the study of the natural human form, systematic processes for the purpose of patient-dental and office-dental laboratory communication, and precise methodologies carried out in the operatory and the laboratory by dedicated professionals. When dentistry is done in this manner, it can be extremely rewarding for everyone involved.

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