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Satisfactory Occlusal Relations for the Individual with a Craniofacial Anomaly

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Introduction

It is possible to describe in a biologic and mechanical way the elements of a "perfect" occlusion. This is a valuable concept for diagnosis and planning the correction of variations from the ideal. However, since perfect occlusions are relatively rare in normal populations, it would seem that nature does not require such perfection. The clinical problem is to know what compromises will still provide a fully functional, healthy, and esthetic dentition for a lifetime.

What Do We Know?

Providers of dental services often apply unrealistic criteria as treatment goals. Surgeons and speech pathologists know they cannot achieve perfection and accept excellence or worse, depending on the original condition. When the malocclusion is mild, it is reasonable for the clinician to disdain treatment that would produce a less-than-ideal result. For many clinicians, this occurs for reasons of personal pride, and not necessarily with the patient's best interests in mind. Yet an analysis of the dentitions of a large group of orthodontists or prosthodontists would reveal a large percentage with untreated, imperfect occlusions.

The individual with a congenital anomaly of the craniofacial complex, whether it is a deficiency, excess, or deformation, has problems that are somewhat unusual. Treating the extremes of malocclusion, however, provides great insight into the nature of a satisfactory occlusion and the minimum requirements for achieving it. Actual problems, not deviations from normal, should be treated. In hemifacial microsomia, for example, the condition is usually unilateral, often with a mandibular condyle and ramus that are severely dysplastic or even absent, no temporomandibular joint, no temporal fossa, and severely hypoplastic or virtually absent muscles of mastication. Yet these patients routinely have an occlusion that has developed well in this distorted environment, have no associated pain or discomfort, can chew and swallow efficiently, and can speak with normal articulation. Apart from the loss of hearing on the affected side, there may be no dysfunction except in the narrowest of definitions: that the temporomandibular joint is absent or grossly dysplastic and mandibular function is not "normal." The primary goal of treatment is to establish optimum facial esthetics, in the course of which there is usually very favorable surgical repositioning of the jaw(s) that permits the orthodontist to realign the teeth in the new jaw position and achieve an excellent occlusion. Treatment is usually for sociologic rather than biologic indications.

The patient's priorities must be given primary importance. In cleft lip and palate, for example, the top priorities are good speech and a healthy self-esteem. With these, the child can grow to enjoy a normal life. The next priority is the appearance, which is a function of the extent of the original nose and lip deformity and the skill of the reconstructive surgeon. Further down the list is the need for a healthy, reasonably functional, and esthetic occlusion. While the dentition contributes to self-esteem, appearance, and speech, it is mainly the maxillary anterior teeth that contribute to those goals.

The most satisfactory approach to these complex problems is the multidisciplinary team. Interdisciplinary communication and treatment planning are essential—not only learning what the other specialists are doing, but when they will do it, what their treatment will do for our treatment, and what our treatment will do to assist them. One of the major benefits of the team approach is discovering the capabilities and limitations of each specialty so the clinician can incorporate or seek assistance from surgical, medical, and paramedical specialists and avoid tunnel vision.

In cleft lip and palate, for example, there are several ways to manage the dental problems arising from a congenital cleft of the anterior maxilla and alveolus with the usual absence of the lateral incisor in the cleft region. The surgeon's first commitment is to repair the oronasal fistula. An inexperienced prosthodontist might feel that a fixed or removable prosthesis would then give the best possible result. The instability of the maxillary segments, however, would preclude long-term success, and the surgeon would therefore be induced to include an autogenous bone graft to the repair to unify the segments. The prosthodontist could then proceed, or an osseointegrated

implant might be used to replace the lateral incisor. The orthodontist, however, might feel that the space is amenable to closure by orthodontic tooth movement through the graft, thus negating the need for any prosthesis but leaving the canine to act as a lateral incisor. If the space is very wide, the orthodontist and surgeon might plan on orthognathic surgery to advance the posterior segment so that the canine contacts the central incisor and then unite the two segments with a bone graft. This would result in an intact, stable maxilla and intact natural dentition in excellent occlusion with no prosthesis required. The canine-central situation is not "perfect," but it is excellent with minor adjustments.

Treatment is often undertaken too soon. A good initial result may be obtained, but very often further growth results in relapse and treatment must be redone later. The total time and effort expended on attempting to maintain an excellent occlusion throughout childhood cannot be justified in terms of extra expense, squandering of patient and parent cooperation, and trauma and inconvenience to the child. Compliance is a serious problem with severe malocclusions. After a childhood of almost constant treatment from a wide variety of specialists, rebellion sometimes occurs in adolescence. Orthodontists and prosthodontists are limited to the existing jaw relations, and if a patient refuses orthognathic surgery, it is impossible to treat without great compromise.

What Do We Not Know?

Surprisingly, one serious problem with multispecialist treatment in severe cases is excessive treatment. First, we would like to know the most efficacious method giving the best long-term results. Unfortunately, most treatment is the result of trial and error. Only fairly recently has a major incentive for quality outcomes research arisen. Such research is sparse at present, and sometimes of poor quality. Many clinicians seem inclined to accept only results that confirm their own beliefs. Second, we would like to know the most efficient method providing the best results with the simplest technique and fewest interventions. With severe cases, there is a tendency to micromanage treatment, which is wasteful of personnel and facilities without improving results.

What standards are essential as opposed to merely desirable? Normal teeth and jaws should satisfy certain criteria: *(1)* a well-functioning occlusion (not necessarily perfect) where food is masticated sufficiently (whatever that is) and swallowed; *(2)* unimpeded breathing and speech; *(3)* dentition and supporting structures free from pathology and maintainable in comfort for life; and *(4)* an appearance that is good enough to the person and to the society in which he or she lives. "Good enough" is not necessarily a derogatory term.

What are the long-term factors for success? What predictions of relapse related to the soft tissue effects, especially lips, cheeks, and tongue, can be made? These are known in general, but individual responses are difficult to predict. Relapse tendencies of implants for adolescents are also not fully known.

What Research Strategies Are Needed?

- Expose dental specialists to multidiscipline teams during their training.
- Encourage treatment outcome studies and improve the quality.
- Especially encourage studies on long-term results.