Skeletal anchorage units: manifold benefit and savings

An interview with Prof. Dr. Flavio A. Uribe regarding ‘Biomechanics in the orthodontic treatment of complex multidisciplinary problems’

Please describe the major aspects of your treatment concept for mutilated dentition.

In recent years, the purview of orthodontics has grown to include an increasing number of adult patients, many of whom present with complex malocclusions which demand complicated treatment plans. Often, these more mature patients are referred by the prosthodontist. In such cases, a prosthetic solution is not possible due to lack of intermaxillary space, proper distribution of the edentulous spaces, canted occlusal planes, etc.

To achieve an optimal occlusion, a multidisciplinary team effort is necessary, but orchestrating and integrating the different disciplines is of paramount importance and must start with the outcome in mind. In order to visualize this outcome, the team has to go through a process of highlighting the problems. Once clear, precise objectives are determined then a mechanical means to obtain that objective can be formulated.

At the University of Connecticut, we first construct our 3-D objective model from a combination of treatment planning tools such as the visualized treatment objective (VTO) and the occlusogram. These are produced on paper and are used to sketch the initial malocclusion and ultimate final outcome (see article).

Based on these “blueprints,” a 3-D model diagnostic wax up is constructed. Since these patients are missing numerous teeth, edentulous open spaces can be difficult, but is managed by relying on the already fabricated 3-D model. The interdisciplinary team uses this model in conjunction with the clearly outlined objectives of treatment to transfer the final position of the implant to the patient. By implementing this course of treatment the implants can be placed prior to any orthodontic appliance and their dual benefit exploited.

What are critical success factors in your concept?

The key to success is a clear and complete understanding of the objectives of treatment by the team of specialists intervening, namely the orthodontist, periodontist and restorative dentist. All the members of the team should have a full understanding of the end result and the shortest path to get there. From the orthodontist’s perspective, the mechanics plan is designed to achieve the objectives with the minimum amount of side effects. Remembering Newton’s third law, “for every action there is an equal and opposite reaction,” the orthodontist must be mindful both of the desired action but also of the repercussion of highlighting the problems. Once clear, precise objectives are determined then a mechanical means to obtain that objective can be formulated.

Where do borderlines have to be set in the use of dental implants for skeletal anchorage, which would later be restored with a prosthesis. Therefore, the patient would have a twofold benefit from a single skeletal anchorage unit. By understanding biomechanics, placement of mini implants would not be necessary and thus the patient would be spared another procedure and expense. For example, it has been shown that intrusion of the incisors can be readily done without the use of direct anchorage of a mini-screw. Dental implants in the posterior can be used to obtain different movements within the posterior buccal segments and simultaneously used as anchorage from which cantilevers are placed to achieve this same intrusion anteriorly.

An understanding of biomechanics allows for a reduction in the number skeletal anchorage units employed. As described, there is a manifold benefit and savings in using skeletal anchorage units. The benefit is in patient comfort, treatment time, patient time spent in the dental chair, patient’s expense and exposure to surgical procedures; overall a clear advantage to the clinician, as well as the patient.

“The key to success is a clear and complete understanding of the objectives of treatment by the team of specialists intervening …”

References