Ask the Experts

IMPLANT PLACEMENT

Guest Expert
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QUESTION: A colleague of mine recently heard a speaker present a lecture about the "six dimensions of dental implant placement." Would you describe those for me?

ANSWER: "Precise three-dimensional placement" is a phrase we have heard in dental implant placement for many years; it stresses the importance of proper implant positioning faciolingually, mesiodistally, and apicocoronally. If these three aspects are not respected by the implant surgeon, then both the restorative doctor and dental laboratory can have difficulties or even complete failure in achieving minimal structural, functional, phonetic, and esthetic goals.

The phrase "fourth, fifth, and sixth dimensions in implant placement" is one that I coined and presented at the 2004 Academy of Esthetic Dentistry Annual Meeting. The fourth dimension involves temporomandibular junction/condylar head position; the fifth dimension is the arrangement of teeth in the arch and interarch relationships; and the sixth dimension involves gingiva and gingival issues. I offer below some simple examples of how we can get into major problems if we do not properly evaluate these dimensions *before* implant placement.

Picture a patient with a Class II Division 1 malocclusion who has a severe anteriorly positioned acquired bite, extensive wear, and a nonrestorable mesiodistal fracture of an upper left first premolar. The patient wants an implant and, in an emergency, receives one—but without a complete evaluation and treatment plan. The correct treatment might actually have been removal of an upper right premolar, orthodontic therapy to retract all the maxillary anterior teeth, and then restoration of any structurally compromised teeth. Because, in reality, the implant often is placed without complete evaluation or interdisciplinary treatment, there is the potential that it will need to be removed later to correct worsening occlusal problems. Therefore, the final "restorative position," as well as the health and stability of both temporomandibular joints, must be determined before an implant is placed.

For the tooth position/interarch relationship dimension (the fifth), there are countless examples. A simple one is a patient with overerupted central incisors who traumatically loses one of them—another common occurrence. What service would we perform for this patient if we were to do a "great job" of implant dentistry and match the missing tooth to the remaining central? The service that should be performed is proper evaluation of the occlusion/tooth position and to inform, educate, and treat the patient (if he agrees) with correction of the malocclusion *before* implant placement. If this step is not performed, the patient might decide later that he wants to correct the malocclusion and have the adjacent central intruded into a more esthetic, functional, and stable relationship. However, he potentially has an implant crown that cannot be moved, does not match the other central in location, and is most likely unesthetic because it is positioned too coronally relative to the orthodontically repositioned teeth.

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The sixth dimension involves the gingiva and the issues of having too much gingiva (usually related to altered eruption), having too little gingiva (recession), discolorations (of the implant site and adjacent teeth), and gingival/periodontal health. The classic example is the patient with short clinical crowns owing to altered eruption who presents to the implant surgeon for an implant to replace a missing maxillary lateral incisor. The surgeon places an implant precisely faciolingually, mesiodistally, and apicocoronally (the first three dimensions), and the restorative dentist restores it after osseointegration. The problem occurs when the patient says the crown "looks funny"; probably its odd appearance is because the tooth dimensions are 7.5 mm wide and 6 mm high, obviously negating any reasonable crown form. The restorative dentist realizes the crown does look like an elongated Chiclet and requests an esthetic crown-lengthening procedure from the periodontist! How does one deal with the shoulder of the implant that is now at or coronal to the free gingival margin after 3 mm of crown lengthening is performed?

These few brief examples demonstrate how "precise three-dimensional implant placement" alone may not result in precise or acceptable treatment results. We must properly evaluate the fourth, fifth, and sixth dimensions *before* we evaluate the first, second, and third—and definitely before we make a hole in the bone for titanium!

Editor's Note: A more complete discussion of this topic will appear in a future issue of the Journal of Esthetic and Restorative Dentistry.

SUGGESTED READING

Chiche G, Pinault A, eds. Esthetics of anterior fixed prosthodontics. Chicago: Quintessence Publishing Co Inc, 1994.

Dawson P, ed. Evaluation, diagnosis, and treatment of occlusal problems. Baltimore: C V Mosby Co, 1989.

Linde J, Karring T, Lang N, eds. Clinical periodontology and implant dentistry. Munksgaard: Blackwell Publishing Ltd, 2003.

Rufenacht C, ed. Fundamentals of esthetics. Chicago: Quintessence Publishing Co Inc, 1990.

Editor's Note: If you have a question on any aspect of esthetic dentistry, please direct it to the associate editor, Edward J. Swift Jr, DMD, MS. We will forward questions to appropriate experts and print the answers in this regular feature.

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