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Compendium

of Continuing Education in Dentistry

Dental Sleep Medicine

Diagnostic, evaluation, and treatment approaches

Stephen Poss, DDS

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Implant Treatment in Maxillary Posterior: Determining the Path to Success

Barry Levin, DMD, PC; Barry Wagenberg, DMD; and Samuel Lee, DDS, DMSc

Q: Sinus grafting vs. short dental implant: What approach would you take?



A: Dr. Levin

When considering “sinus graft versus short dental implant,” there is no clear, singular solution, as both approaches are substantiated in the scientific literature. The question could be posed as,

“Which technique are surgeons more comfortable with in maxillary posterior sites?”

With the majority of occlusal forces on implants concentrated in crestal bone, short implants *should* be acceptable in most situations. This concept is mainly supported in finite-element models. In patients with meticulous oral hygiene, physiologically restored occlusions, favorable bone trabecular patterns, and adequate maintenance, short implants serve a purpose.

In patients with pre-existing periodontal diseases, excessive occlusal forces, poor bone density, and less-than-optimal hygiene, peri-implant bone loss can occur. Also, implant design may predispose patients to crestal bone modeling. Most implants are placed level to crestal bone. In posterior sites, the cortical bone at the crest is thin and is lost after functional loading in many situations, particularly those cases without platform-switched connections. In posterior edentulous sites, the length of clinical crowns can be significantly greater than natural teeth prior to tooth loss and alveolar bone resorption. Unfavorable crown-to-implant ratios may compromise prognoses of these implants.

What is often overlooked with short implants is the potential for peri-implantitis. When several millimeters of bone is lost around a 6-mm to 8-mm implant, the overall percentage of loss of osseous support can be significant, whereas with 10-mm or longer implants, the loss of 1 mm to 2 mm of bone may not significantly impact the long-term prognosis of the implant(s) and restorations. With short implants, 20% to 50% bone loss and unfavorable crown-to-implant ratios are cause for concern.

Sinus grafting is normally predictable, safe, and not associated with significant morbidity. For experienced surgeons, sinus lift surgery is typically a short, minimally traumatic procedure. No longer is there a need to harvest autogenous bone, which is often from mandibular sites. Numerous studies^{1,2} support various “out of the bottle” bone grafting materials for sinus elevations, and

recombinant growth factors increase bone formation and shorten treatment time significantly. However, with a staged approach, treatment time, the number of procedures, and costs are increased. This is the main reason why shorter implants have grown in popularity.

Offering patients expedient, more economical options of posterior tooth replacement, such as short implants, frequently results in greater case acceptance. Also, more extensive surgical therapy requires stable systemic and localized sinus health, occasionally necessitating otolaryngologic therapy to treat antral polyps, chronic inflammation, etc., prior to sinus grafting. Additionally, patients on anticoagulant therapy often need to temporarily discontinue their medication prior to dental surgery, and minimizing the number of procedures reduces cardiovascular risks.

Evidence supports the use of short and wide-diameter implants as viable alternatives to sinus graft surgery and delayed placement of longer implants.^{3,4} Bone-to-implant contact with newer implant surfaces is substantially greater compared to older implant surfaces. Also, wide-diameter implants not only provide more appropriate restorative platforms, but they also increase the overall bone-to-implant contact compared to standard-diameter implants.

There are many variables that must be appreciated for each patient’s situation; therefore, one uniform approach is not realistic. After evaluating the patient’s systemic and periodontal condition, then diagnosing the occlusal and parafunctional situation, both options have a place in the treatment of posterior edentulous maxilla.



A: Dr. Wagenberg

In cases in which the maxillary sinus extension leaves minimal bone available for dental implant placement, the clinician faces at least four choices in deciding how to restore the posterior dentition. The four options for consideration are: a fixed bridge, if there are both mesial and distal potential abutments; a maxillary sinus lift (window approach); an internal sinus lift, if there is adequate bone available to lift; and short dental implants, if at least 4 mm of bone is available.

Most patients do not wish to have their existing dentition altered for a fixed bridge. This option is also dependent on the potential strength and viability of both abutments. However, because this approach is likely the least invasive and costly for the patient, it is an option that must be considered.

In the past, I frequently used maxillary sinus lifts with a window approach to increase the amount of bone available to support an