

Dr. Dale M. Gallagher, Oral and Maxillofacial Surgeon, presents

# Practical Practice Pearls

## For Dental and Medical Professionals

This newsletter is published monthly and contains useful information about current pharmacology and therapeutics, pathology, techniques, and procedures used for the management of diseases and conditions of the hard and soft tissues of the face and mouth. Please contact us to be added or removed from our fax list, and/or with your comments and suggestions for "Pearl Topics". Copyright 2004 by Dale M. Gallagher, DDS, PA, 12210 Pecan Street, Austin, Texas 78727 phone: 512 258-1636; fax: 512 258-6352; email: dgallagher@jawpain.com

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### Alveolar Ridge Deformities... ...Definition, Prevention and Management

The alveolar ridge is the foundation for an esthetic smile, tooth stability, and chewing function. This principle of "foundation" is an important one that concerns all dentists. The orthodontist moves teeth within the alveolus. The restorative dentist enhances the occlusion over the alveolus, whether with fixed or removable prosthetics. The periodontist stabilizes teeth within, and reshapes, the alveolus. The oral surgeon changes the morphology and position of the alveolar bone, even when teeth may or may not be present.

Obviously, dental reconstructive endeavors will fail if the alveolar bone is defective, deformed, or in an improper position. For example, implant failure is commonly attributed to alveolar bone deformities, either due to abnormalities of bony morphology or the mal-relationship of the alveolar ridge of one dental arch to the other. Dental relapse following orthodontic therapy can occur if the teeth are not properly positioned within the alveolus.

This newsletter is about defining alveolar ridge deformities. Alveolar deformities are categorized according to dimension, volume, and position.

Dimensional deformities are deficiencies and/or excesses of the width, height, and contour of the alveolar ridge. A common width deficiency is the facially concave ridge that occurs after traumatic loss of a maxillary incisor tooth. A combined deficient width and height deformity is often present when a tooth has been missing for a long time, hence producing a "saddle" ridge. Examples of excessive alveolar ridge deformities are large maxillary tuberosities and large buccal tori, which often must be removed to make room for occlusal vertical dimension reconstruction, or placement of a denture.

A "knife-edge" alveolar ridge is an advanced deformity of great deficiency in three dimensions, a true volumetric deformity. The most challenging alveolar ridge volume deformities that the dentist may encounter are the atrophic maxilla and mandible. More subtle, but equally problematic, is the deficient posterior maxillary alveolus with minimal bone which is often attributed to a "large maxillary sinus", but it is actually just deficient bone.

Positional alveolar bone deformities are often poorly recognized by dentists. Most posterior cross-bites are not due to problems of tooth position within bone, but are due to *horizontal deficiencies of bone growth*. That is, when the posterior maxilla does not grow wide enough, then there will be a "narrow" maxilla with posterior cross-bites. This can occur unilaterally or bilaterally, but if either is not corrected by moving the alveolus then any restorations placed upon or within it are doomed to have problems.

Hyper-eruption of posterior teeth is an excellent example of a vertically excessive alveolar ridge deformity. How many times have you seen a patient that has lost mandibular molars and the maxillary molars have hyper-erupted? It is difficult, if not impossible, to replace the missing mandibular molars (either with implants or a removable prosthesis) because there is inadequate vertical space for the prosthetic crowns. The solution begins with recognizing that the maxillary alveolus *with the teeth in it* has grown too far down. Treatment is moving the alveolus *with the teeth in it* upwards, a procedure called posterior maxillary segmental osteotomy with superior repositioning. More about alveolar osteotomies in a future newsletter.

The next time you look in a patient's mouth, evaluate their alveolar bone according to its dimension, volume, and position. Then, chart your evaluation as part of the diagnostic record. In future newsletters we will discuss how to prevent some alveolar deformities (dental extraction techniques) and how to treat/manage alveolar problems you may discover. But first, a few words about alveolar bone...

Bone responds to the forces that are (or are not) placed upon it. This is very true with alveolar bone. Bone is present around teeth because of the forces that are transmitted through the teeth to the bone. Also, dental implants help maintain bone because the forces of occlusion are carried into the bone through the implant. When teeth are gone bone resorption occurs. Resorption (and eventual atrophy) is accelerated when external (not internal) forces are placed upon the alveolus. This is why the edentulous anterior maxilla rapidly shrinks to the level of the anterior nasal spine when the maxillary denture is opposing a natural lower anterior dentition. Poorly fitting dentures that rotate upon the alveolar ridge cause bony atrophy often with excessive soft tissue hyperplasia (epulis). The lesson here is: Maximize alveolar bone by restoring the dentition so that occlusal forces place force *within* bone, either with the natural teeth, dental implants, or dentures that fit very well.

Other causes of alveolar deformities include alveolar clefts, cysts, tumors, and trauma.

***The most common cause of alveolar bone deformity is tooth extraction, and the way the resultant socket/alveolus is (mis)managed.***

The next several **Practical Practice Pearls** will cover several topics very thoroughly. These topics will include dental extractions, dentoalveolar trauma, alveolar ridge augmentation, bone grafts and membrane barriers, alveolar osteotomies, dental segmental osteotomies, accelerating orthodontic tooth movement, and other topics with tips and tricks that can help you care for your patients.

Have a great month, and tell your friends about us.