

PerioDontaLetter



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From Our Office to Yours...

Altered passive eruption is characterized by excessive gingiva in relation to the crown of the tooth. This condition may be localized or generalized, may exist in conjunction with or without periodontal disease and should be considered in planning for restorative, orthodontic and esthetic dentistry.

While altered passive eruption is usually diagnosed by clinical observation, this condition is often overlooked or unrecognized. Failure to recognize this condition can result in compromised clinical outcomes.

*Correct diagnosis of altered passive eruption and proper therapy will result in improved dental care and esthetic results for our patients. This issue of **The PerioDontaLetter** will address these considerations.*

As always, we welcome your questions and suggestions.

Altered Passive Eruption -- The Undiagnosed Condition

Tooth eruption consists of an active and a passive phase. Active eruption is the movement of the teeth in the direction of the occlusal plane, whereas passive eruption is related to the exposure of the teeth by apical migration of the gingiva.

Originally thought to be a normal physiologic process, passive eruption can at times be considered a pathologic process.

Gottlieb et al divided passive eruption into four stages based upon the relationship between the

epithelial attachment and the cemento-enamel junction (CEJ).

- In Stage 1, the teeth reach the line of occlusion and the junctional epithelium lies totally on the tooth enamel.

- In Stage 2, the epithelial attachment rests partially on the enamel and partially on the cementum apical to the CEJ. The base of the sulcus is still on the enamel.

- In Stage 3, the entire junctional epithelium lies totally on the cementum with the base of the sulcus at the CEJ.



Figure 1. This 16-year-old female exhibited very short clinical crowns as a result of altered passive eruption. (See photos page 2)



Figure 2. Upon flap reflection, the anatomic crowns have just barely erupted through the alveolar process. The bone is at the cemento-enamel junction which prevents gingival attachment to the root surface.



Figure 3. 3mm of bone was removed to create room for a normal biologic width attached to the cementum and the gingival margins were repositioned apically with papilla retention.



Figure 4. Two-weeks post operatively, the teeth have a pleasing cosmetic appearance and the dimensions of the clinical crowns are normal.

• Finally, in Stage 4, the epithelial attachment lies totally on the cementum, the base of the sulcus is on the cementum, and a portion of the root may be clinically exposed. Proliferation of the junctional epithelium onto the root is accompanied by degeneration of gingival and periodontal ligament fibers and their detachment from the tooth. It is currently believed this degeneration is the result of chronic inflammation and therefore represents a pathologic rather than a physiologic process.

When passive eruption does not progress past stage one or two, it is referred to as altered or delayed. This creates a clinical crown that appears short due to the presence of excess gingiva which covers the enamel.

Occurrence of altered passive eruption is unpredictable, but the incidence in the general population is about 12 percent.

Diagnosing Altered Passive Eruption

Clinically, the most obvious sign of altered passive eruption is a

short-looking tooth. Altered passive eruption is a physiologic variation with excess gingiva covering the crown of the tooth.

Normally, the CEJ lies just apical to the gingival margin of the anatomic crown. Sulcus depth usually measures 1 to 3mm. In cases of altered passive eruption, the CEJ might be up to 10mm apical to the gingival margin.

There may be no other clinical signs of disease such as bleeding upon probing, suppuration, inflammation or radiographic bone loss.

In some cases, excess gingival tissue interferes with oral hygiene and contributes to plaque accumulation. Probing depth often reveals a deep sulcus associated with marginal inflammation of the gingival tissues.

Restorations and orthodontic appliances placed in or near the sulcus may contribute to an exaggerated inflammatory response. Increased probing depth may be the result of excessive soft tissue rather than attachment loss. However, in the periodontally susceptible patient, attachment loss and bone resorption may occur as well.

Eruption does not cease when teeth make occlusal contact with teeth in the opposing arch but continues throughout life. If the junctional epithelial tissues do not recede to the CEJ by adulthood, corrective measures may be required to maintain health or enhance esthetics.

The Biologic Width

Gargiulo et al established a definite dimensional relationship between the crest of the alveolar bone, connective tissue attachment, epithelial attachment and sulcus depth. They called this relationship the **biologic width**.

Gargiulo found that the width of the connective tissue attachment, however, remains fairly constant with a mean average of 1.07mm. The junctional epithelium normally averages 0.97mm. The combined dimension of the connective tissue attachment and the epithelial attachment averages 2.04mm.

When contemplating any surgical, restorative or orthodontic pro-

cedure, maintenance of the biologic width is essential.

Periodontal Treatment, Esthetic Considerations and Restorative Requirements

Altered passive eruption should be treated if periodontal disease is evident or if there are restorative, orthodontic or esthetic considerations.

Additionally, if excessive tissue following orthodontic therapy is not resolved, gingival surgery is indicated.

It is incumbent upon the orthodontist to recognize that altered passive eruption will not resolve itself and will require a corrective periodontal procedure.

The management of altered passive eruption may include periodontal surgery, crown lengthening, and in selected cases, forced eruption.

As with all periodontal treatment, the initial phase involves a proper diagnosis and control of etiology.

When periodontal surgical procedures are indicated, the objective is to apically position the soft tissue to the appropriate esthetic height while producing sufficient sound tooth structure so the biologic width will not be violated when restorative procedures are implemented.

Altered passive eruption can cause anterior teeth to appear too short and contribute to excessive gingival display.

When full exposure of the anatomic crown is achieved surgically to eliminate excessive gingival display, there is a dramatic improvement in esthetics.

Crown lengthening is an integral component of the esthetic



Figure 5. Orthodontic therapy in altered passive eruption creates a large gingival appearance with short teeth.



Figure 6. Two weeks post operatively, the teeth have a much more pleasing, natural appearance and orthodontic movement is facilitated.

armamentarium for treating these situations because it provides adequate tooth structure while simultaneously assuring the integrity of the biologic width.

When periodontal surgical procedures are indicated to enhance restorative dentistry, it is imperative the surgeon and the restorative dentist have excellent communication, to ensure the most favorable clinical outcomes for their patients.

In summary, altered passive eruption may present as a non-pathologic entity or as a pathologic condition requiring various forms of more aggressive treatment.

The indications for surgical intervention may include periodontal, restorative, orthodontic or cosmetic issues and all of these must be respectful of the biologic width.

We hope this discussion of altered passive eruption will help in the diagnosis and treatment of this often overlooked and unrecognized condition.

As always, we look forward to collaborating with you in the diagnosis and treatment planning of these interesting cases and thank you for the opportunity to participate in the care of your patients.



Figure 7. A gummy smile is the result of altered passive eruption.



Figure 8. Two weeks following osseous resection and apical flap positioning, the smile is cosmetically pleasing.

Saving Smiles -- Saving Lives

Recent studies suggest that people with periodontal disease have nearly twice the risk of a fatal heart attack and three times the risk of stroke as those without periodontal disease. This may be because oral bacteria attach to atherosclerotic plaques in arteries, thus contributing to their rupture and subsequent clot formation.

A two-year study of 144,000 insured patients by Aetna and the Columbia University College of Dental Medicine released in March, 2006, found that earlier periodontal treatment reduced overall medical care costs by 16 percent for coronary artery disease and 11 percent for cerebrovascular disease or stroke!

Since periodontal disease is treatable and almost 100 percent preventable, our patients now have a vital, even potentially life-saving reason -- beyond just a pretty smile and comfortable chewing -- to make sure they have healthy mouths.

Death from cardiovascular disease has become epidemic. Heart disease and stroke cause more than 50 percent of all deaths in the United States. That's almost one million deaths per year -- 335,000 sudden deaths -- one every two minutes! Preventing many of these deaths is possible if we encourage our patients to follow these 6 D's:

1. Diagnose!

The most common major signal of angina and possibly an impending heart attack is a feeling of pressure under the sternum brought on by exercise and relieved by rest. Sudden sweating, shortness of breath and referred pain to the left arm, lower jaw or other areas may occur. It is not a sharp pain over the heart.

2. Don't Deny or Delay!

Most of the time there are warning signs before a heart attack. (See Diagnose.) Don't take the attitude: "Don't worry, honey, it's only indigestion!" Half of all heart attacks occur in people with no risk factors; 70 percent occur when a smaller non-occluding plaque ruptures and a clot forms. It Can Happen to You!

3. Do Call 911 with one or more of the above signs and get to an emergency room immedi-

ately. Early clot dissolving therapy can greatly reduce heart and/or brain damage in some types of heart attacks. Balloon angioplasty of blocked heart attacks within 90 minutes will also greatly reduce heart damage.

4. Defibrillate immediately if unresponsive with no pulse. In cardiac arrest, the best chance of survival occurs in the first three minutes. Survival drops ten percent per minute. It is 90 percent at one minute and 0 percent at ten minutes. Emergency Medical Response is unlikely to arrive in time. Train yourself and others how to use a defibrillator. It's easy. Immediately after one shock, begin CPR. The new American Heart Association CPR guidelines call for five cycles of 30 hard and fast chest compressions **first** followed by two short one-second breaths.

5. Develop a Doctor Relationship.

Get annual physicals. Don't say: "I'm too busy, I'll do it later." Take statins and aspirin if advised. A recent study of 59,094 new statin users published in the *European Heart Journal* documented a 30 to 40 percent reduction in heart attacks after two years of statin use compared to those who didn't take their recommended dose of statins. The American Heart Association recommends an optimum LDL of under 100.

6. Do Make Life Style Changes Early

to prevent heart attack! Twenty percent of adults age 30-34 already have advanced plaque formation. The incidence of heart attacks can be reduced by two-thirds with a low fat diet, weight control, exercise, not smoking, moderate alcohol consumption and blood pressure control.

