

A Review On Trauma From Occlusion- A Major Factorinfluencing The Periodontium

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ABSTRACT

Any occlusal force that exceeds our periodontium's adaptive capacity causes injury to periodontal structures, and the resulting trauma is known as trauma from occlusion (TFO). There are several schools of thought on whether TFO is an etiological factor or a cofactor in the occurrence of periodontal diseases. The current review paper aims to clarify the true meaning of TFO, as well as its historical context, etiological variables, important terminology, signs and symptoms, and advanced diagnostic approaches.

KEYWORDS: *Trauma from Occlusion, Parafunctional Habits, Occlusal Recontouring*

I.Introduction

Occlusion trauma is characterised as microscopic modifications of periodontal structures in the area of the periodontal ligament that manifest clinically as tooth mobility elevation. As previously stated, all tissues have an intrinsic "margin of safety" that allows for some fluctuation in occlusion without harming the periodontium. Tissue injury occurs when occlusal forces surpass the adaptive capability of the tissues. Trauma from occlusion, also known as occlusal trauma, is the outcome of the occlusion.

II. Other names of TFO:

Occlusal trauma, Traumatizing occlusion Occlusion causing trauma, Periodontal trauma, often known as periodontitis, is a type of periodontal disease that Occlusal overabundance, Discord in the occlusion, Unbalanced functionality, Occlusal dystrophy is a condition that affects the teeth.

III.Classification of trauma from occlusion Glickman's classification (1953)

Acute trauma:

Periodontal alterations caused by an abrupt occlusal contact, such as biting on a hard item, are referred to as acute trauma from occlusion (e.g., an olive pit). Acute trauma can also be caused by restorations or prosthetic appliances that interfere with or change the direction of occlusal forces on the teeth. Acute trauma causes tooth discomfort, percussion sensitivity, and increased tooth movement. The injury heals and the symptoms lessen if the force is removed by a shift in the location of the tooth or by the wearing away or adjustment of the

restoration. Otherwise, periodontal injury may increase, leading to necrosis and the formation of a periodontal abscess, or it may remain asymptomatic for a long time. Cementum tears can also be caused by acute trauma.

IV. Chronic trauma

Periodontal changes associated with gradual changes in occlusion caused by tooth wear, drifting movement, and extrusion of the teeth in combination with parafunctional habits (e.g., bruxism, clenching) are referred to as chronic trauma from occlusion rather than as a sequela of acute periodontal trauma. Chronic occlusion trauma is more common than acute occlusion trauma, and it has a greater therapeutic impact. If occlusion trauma is regarded the primary etiologic cause in periodontal damage and occlusion is the only local modification to which a tooth is subjected, it is referred to as primary trauma from occlusion.

Periodontal damage around teeth with a previously healthy periodontium can occur as a result of the following: The placement of a "high filling"; the placement of a prosthetic replacement that places excessive forces on the abutment and antagonistic teeth; the drifting movement or extrusion of teeth into spaces created by missing teeth that have not been replaced; or (4) the orthodontic movement of teeth into functionally unacceptable positions. Most experiments on the effects of occlusion stress on experimental animals have focused on the primary form of damage.

V. Primary trauma from occlusion

The amount of connective tissue attachment is not altered by original trauma, and pocket development is not initiated. This is most likely because the supracrestal gingival fibres are unaffected, preventing the junctional epithelium from migrating apically.

VI. Secondary trauma from occlusion

Secondary trauma from occlusion occurs when the adaptive capacity of the tissues to withstand occlusal forces is impaired by bone loss that results from marginal inflammation. This reduces the periodontal attachment area and alters the leverage on the remaining tissues. The periodontium becomes more vulnerable to injury, and previously well-tolerated occlusal forces become traumatic. A traumatogenic occlusion will lead in increased mobility, widening of PDL, and crestal bone loss along with bone volume but no attachment loss in the absence of inflammation. Excess jiggling forces did not produce higher attachment loss in squirrel monkeys when gingival inflammation was present, but accelerated occlusal forces may promote attachment loss in beagle dogs. Even though there will be no difference in attachment level, addressing the inflammation in the presence of mobility would at the very least reduce tooth mobility and aid in bone density increase.

VII. Stages of tissue response

Stage I Injury:

Improper pressure causes resorption of the alveolar bone and enlargement of the periodontal ligament space, which results in alterations in the PDL, such as fibre compression and hyalinization. Excessive tension causes elongation of the periodontal ligament fibres and

apposition of the alveolar bone. There are various blood vessels that are reduced in size in places of excessive pressure, whereas they are increased in areas of severe tension.

Stage II Repair:

TFO stimulates increased reparative activity in the typical periodontium, which occurs on a regular basis. When bone is resorbed as a result of high occlusal stresses, the body replaces the thinned bony trabeculae with new bone. Buttressing bone growth is the process of compensating for the missing bone. Central buttressing refers to bone production within the jaw, while “peripheral buttressing” refers to bone formation on the bony surface. Peripheral buttressing, often known as "lipping," can result in a shelf-like thickening of the alveolar edge or an obvious bulge in the facial and lingual bone.

Stage III Adaptive remodeling of the periodontium

If the occlusion's destruction exceeds the mending procedure, the periodontium is redesigned to restore the structural link. If the occlusion's destruction exceeds the mending procedure, the periodontium is redesigned to restore the structural link. The teeth that are involved become movable. There will be a rise in vascularization as well.

Effects of insufficient occlusal force:

The supporting periodontal tissues may also be harmed by insufficient occlusal force. Insufficient stimulation results in periodontal ligament weakening, fibre atrophy, alveolar bone osteoporosis, and bone height loss. Hypofunction can be caused by an open bite, a lack of functional antagonists, or unilateral eating patterns that ignore one side of the mouth.

VIII. Diagnosis of TFO:

Increased tooth movement is the most common symptom of primary TFO. Mechanical and electronic instruments can be used to test mobility. Subjective mobility tests are performed using the Miller classification system, which assigns a score from 0 to 3. Individual tooth or whole segments can tilt and migrate. If there is primary TFO in attachment apparatus, the percussion of teeth on tapping with a blunt object changes from a resonant note with a healthy supporting framework to a dull note. Palpation of the masticatory muscles to determine if there is hypertrophy or signs of hypertonicity, as well as probable spasm of one muscle group.

TMJ palpation and observation of any mandibular deviation in distinct closure paths. The Fremitus test (Hallmon WW 1999) assesses the vibratory patterns of the teeth during touch and movement.

The following classification system is used:

Mild vibration or movement has been recorded in Class 1.

Class II: Vibration is easily felt but there is no visible movement.

Movement that can be seen with the naked eye is classified as Class III.

IX. Signs(Glickman I 1972, Reinhardt RA, 2015)

Mobility and periodontal ligament expansion are two clinical symptoms. The fremitus test came back positive. Lamina dura thickening can be detected in the apical region and bifurcation locations.,Prematurities of the occlusion.

X. Radiographic signs(Carranza fa 2004)

The lamina dura thickens along the root's lateral face, apical area, and bifurcation, causing periodontal ligament expansion. The interdental septum is destroyed vertically. Alveolar bone condensation and radiolucency. The root is resorbing. Teeth are migrating. Fracture of a tooth
Sensitivity to heat

XI. Treatment plan for TFO

Occlusal adjustment

Occlusal adjustment is the process of establishing functional relationships that are appropriate for the periodontium by procedures such as coronoplasty, dental restorations, tooth removal, or orthognathic surgery. The proper diagnosis of bruxism can be obtained by adjusting sleep arousal or anxiety levels, as well as using gadgets to stabilise the maxilla. by taking a thorough medical history and evaluating the patient's clinical characteristics

Parafunctional habits

Treatment options for patients with bruxism include: Medication, electromyographic biofeedback, and a physical therapy course A splint is a device that is used to immobilise or stabilise a person's body. (Joe McCall, 1964). Splinting is the process of connecting two or more teeth together to strengthen resistance to the forces that are applied. Short-term splints, medium-term splints, and long-term splints are the three varieties. Occlusal reconstruction is required when no other treatment can accomplish occlusal equilibration.

Occlusal recontouring

It entails the use of crowns, bridges, or implant-supported prostheses to reshape the occlusal contacts.

Extraction

When a tooth has a bad prognosis and extraction improves the prognosis of the other teeth, the tooth in issue should be extracted.

XII. Conclusion

The lack of clear evidence based on well-controlled prospective human research has led to uncertainty in the management of TFO-affected periodontium. The most important therapy for teeth damaged by TFO is the removal of abnormal occlusal forces and stability of the affected tooth/teeth.

References

1. Lascala NT, Moussalli NH. Contemporary of periodontal therapeutics. 2nd ed. São Paulo: ArtesMédicas; 1995.
2. Carranza FA. Clinical Periodontology. 9th ed. Rio de Janeiro: GuanabaraKoogan; 2004.
3. Hallmon WW, Harrel SK. Occlusal analysis, diagnosis and management in the practice of periodontics. *Periodontol 2000* 2004;34:151-64.
4. Lindhe J. Clinical Periodontology and Implant Dentistry. 3rd ed. Rio de Janeiro: Guanabara Koogan; 2004.
5. Gher ME. Changing concepts. The effects of occlusion on periodontitis. *Dent Clin North Am* 1998;42:285-99.
6. Harrel SK. Occlusal forces as a risk factor for periodontal disease. *Periodontol 2000* 2003;32:111-7.
7. Reinhardt RA, Killeen AC. Do mobility and occlusal trauma impact periodontal longevity? *Dent Clin North Am* 2015;59:873-83.
8. Stillman PR. The management of pyorrhea. *Dent Cosmos* 1917;59:405.
9. Glickman I, Smulow JB. Alterations in the pathway of gingival inflammation into the underlying tissues induced by excessive occlusal forces. *J Periodontol* 1962;33:7-13.
10. Glickman I, Smulow JB. Further observations on the effects of trauma from occlusion in humans. *J Periodontol* 1967;38:280-93.
11. Glickman I, Smulow JB. Adaptive alterations in the periodontium of the rhesus monkey in chronic trauma from occlusion. *J Periodontol* 1968;39:101-5.
12. Goldman HM. Gingival vascular supply in induced occlusal traumatism. *J Oral Surg* 1956;9:939-41.
13. Waerhaug J. The angular bone defect and its relationship to trauma from occlusion and downgrowth of subgingival plaque. *J Clin Periodontol* 1979;6:61-82.
14. Waerhaug J. The infrabony pocket and its relationship to trauma from occlusion and subgingival plaque. *J Periodontol* 1979;50:355-65.
15. Polson AM. Interrelationship of inflammation and tooth mobility (trauma) in pathogenesis of periodontal disease. *J Clin Periodontol* 1980;7:351-60. 20:693-8.