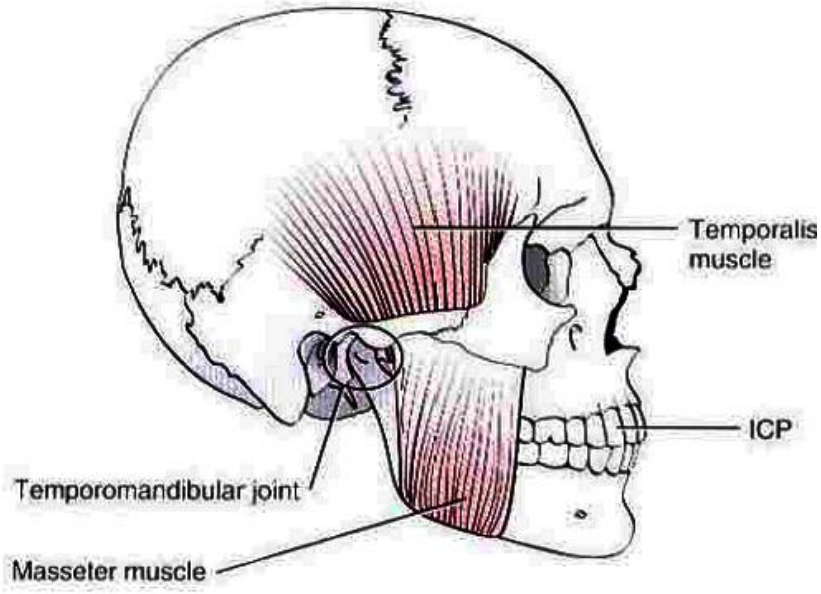
TRAUMA FROM OCCLUSION IN THE HEALTH AND PERIODONTITIS

Assoc. Prof. Dr. Theodora Bolyarova, DDM, PhD

Trauma from occlusion is a term used to describe pathologic alterations or adaptive changes which develop in the periodontium as a result of excessive force produced by the masticatory muscles.

In addition to producing damage in the periodontal tissues, excessive occlusal force may also cause injury in:

- the temporomandibular joint,
- the masticatory muscles, and
- the pulp tissue.



Carranza's Clinical Periodontology, Eleventh Edition, 2014

Trauma from occlusion was defined by Stillman (1917) as a condition where injury results to the supporting structures of the teeth by the act of bringing the jaws into a closed position".
In "Glossary of Periodontic Terms" (American Academy of Periodontology, 2001), occlusal trauma was defined as "Injury resulting in tissue changes within the attachment apparatus as a result of occlusal force(s)".

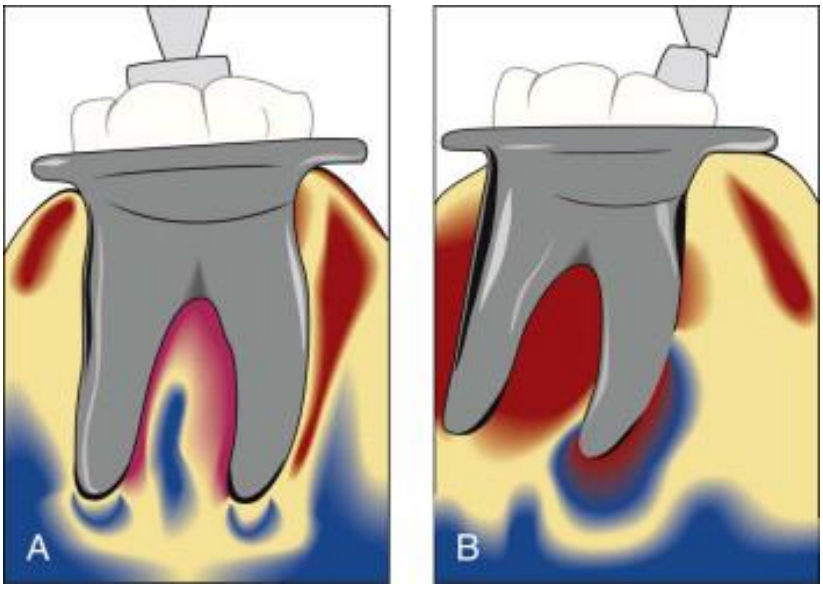
OCCLUSAL TRAUMA AND TRAUMATIC OCCLUSAL FORCES

Traumatic occlusal force is defined as any occlusal force resulting in injury of the teeth and/or the periodontal attachment apparatus (Consensus report of workgroup 3 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions). These were historically defined as excessive forces to denote that the forces exceed the adaptive capacity of the individual person or site.

Occlusal trauma is a term used to describe the injury to the periodontal attachment apparatus, and is a histologic term. Nevertheless, the clinical presentation of the presence of occlusal trauma can be exhibited clinically.

TABLE 3 Classification of traumatic occlusal forces on the periodontium

1. Occlusal trauma
A. Primary occlusal trauma
B. Secondary occlusal trauma
C. Orthodontic forces



Carranza's Clinical periodontology, 11th Edition.

Stress patterns around the roots changed by shifting the direction of occlusal forces (experimental model using photoelastic analysis).
A) Buccal view of a molar subjected to an axial force. The shaded fringes indicate that the internal stresses are at the root apices.
B) Buccal view of molar subjected to a mesial tilting force. The shaded fringes indicate that the internal stresses are along the mesial surface and at the apex of the mesial root.

Classification of trauma from occlusion based on the duration:

Acute trauma from occlusion

Results from an abrupt occlusal impact, such as that produced by biting on a hard object.
(Carranza's clinical periodontology 9th edition)
Clinical features:

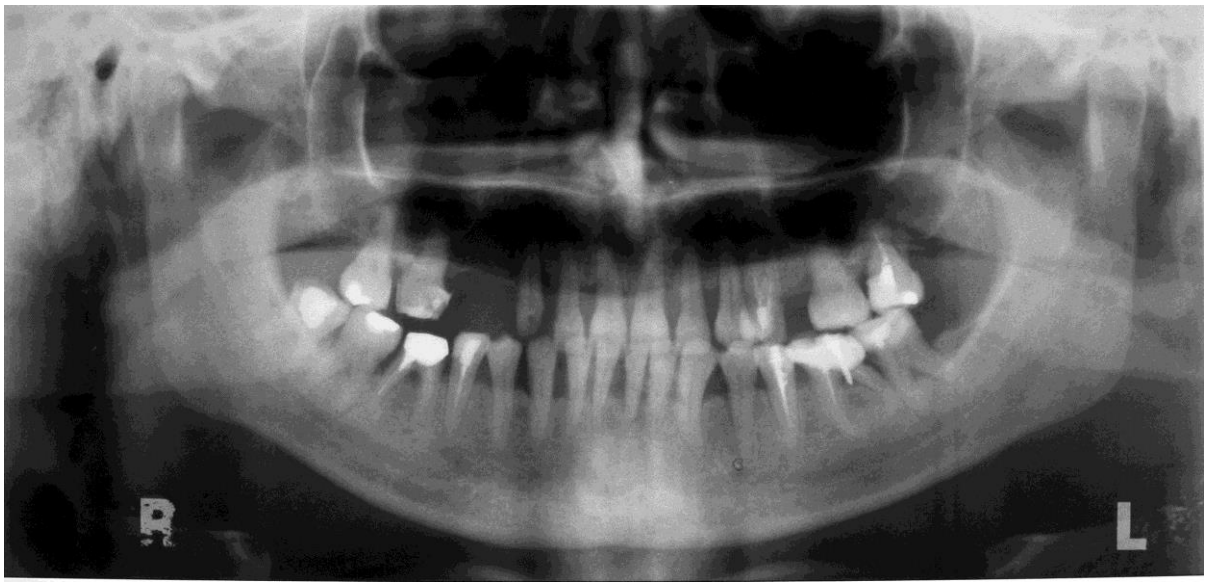
1. Tooth pain.
2. Sensitivity to percussion.
3. Tooth mobility.

Chronic trauma from occlusion

- is more common than the acute form and is greater clinical significance.
- it most often develops from gradual changes in occlusion produced by tooth wear, drifting movement, extrusion of teeth, combined with parafunctional bruxism and clenching.

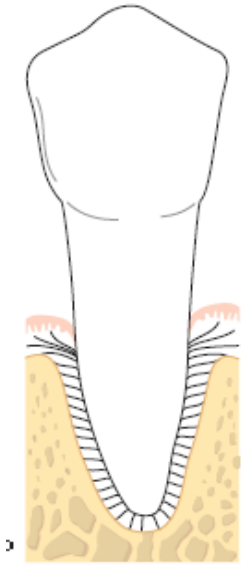
Trauma from occlusion is often divided into primary and secondary.
Primary occlusal trauma has been defined as injury resulting in tissue changes from traumatic occlusal forces applied to a tooth or teeth with normal periodontal support. This manifests itself clinically with adaptive mobility and is not progressive.
Secondary occlusal trauma has been defined as injury resulting in tissue changes from normal or traumatic occlusal forces applied to a tooth or teeth with reduced support.
The Working group (Consensus report of workgroup 3 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions) considered the term *reduced periodontium* related to secondary occlusal trauma.
A "reduced periodontium" with active periodontitis is meaningful when mobility is progressive indicating the forces acting on the tooth exceed the adaptive capacity of the person or site.
Teeth with progressive mobility may also exhibit migration and pain on function.





Clinical case (T. Bolyarova). Secondary occlusal trauma in a patient with severe periodontitis, tooth migration.

Symptoms of trauma from occlusion may develop only in situations when the magnitude of the load elicited by occlusion is so high that the periodontium around the exposed tooth cannot properly withstand and distribute the resulting force with unaltered position and stability of the tooth involved.



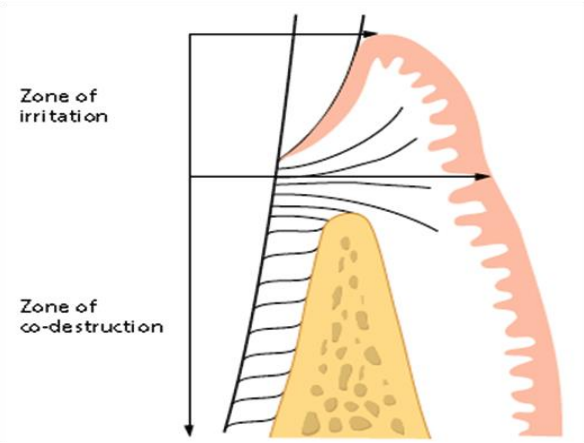
In cases of severely reduced height of the periodontium even comparatively small forces may produce traumatic lesions or adaptive changes in the periodontium.

Glickman (1965, 1967) claimed that the pathway of the spread of a plaque-associated gingival lesion can be changed if forces of an abnormal magnitude are acting on teeth harboring subgingival plaque.

Glickman's concept:

The periodontal structures can be divided into two zones:

1. The zone of irritation.
2. The zone of co-destruction.



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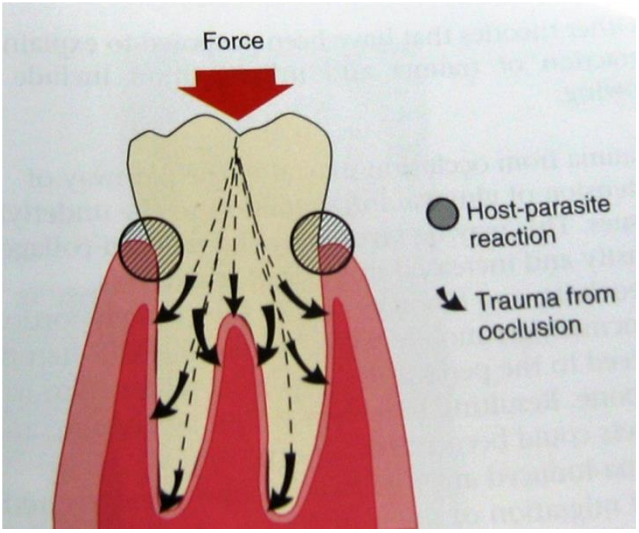
The zone of irritation includes the marginal and interdental gingiva. Gingival inflammation is the result of irritation from microbial plaque.

The plaque-associated lesion at a “non-traumatized” tooth propagates in the apical direction by first involving the alveolar bone and later the periodontal ligament area. The progression of this lesion results in a horizontal bone destruction.

The zone of co-destruction includes the periodontal ligament, the root cementum, and the alveolar bone, and is coronal demarcated by the transseptal (interdental) and the dentoalveolar collagen fiber bundles.

The fiber bundles which separate the zone of co-destruction from the zone of irritation can be affected from two different directions:

1. From the inflammatory lesion maintained by plaque in the zone of irritation.
2. From trauma-induced changes in the zone of co-destruction.

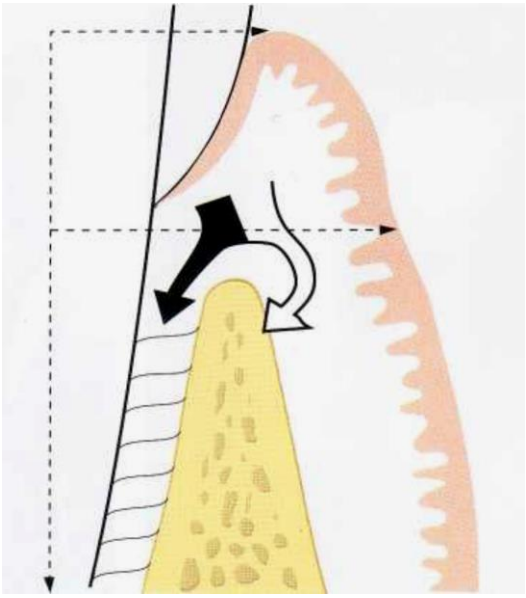


Carranza's Clinical Periodontology, Eleventh Edition, 2014

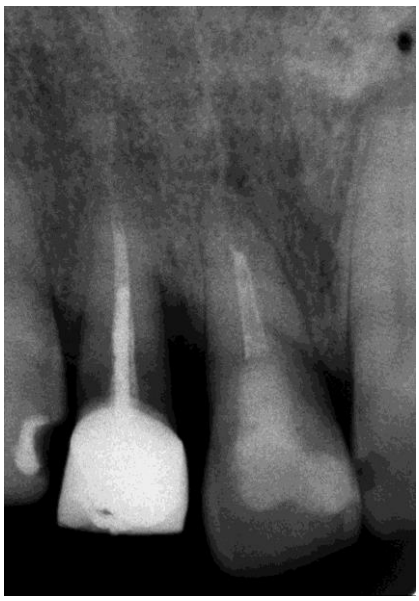
Accumulation of bacterial plaque affect marginal gingiva.

Trauma from occlusion causes changes in the supporting tissues.

Occlusal stress increases the prevalence and progression of periodontal destruction; adversely affects the healing results. The spread of an inflammatory lesion may be facilitated and development of angular bony defects.



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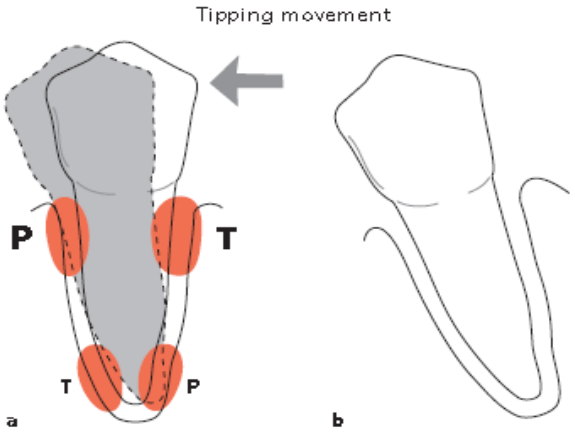
Clinical case (T. Bolyarova)

In the early 20th century authors suggest that occlusal trauma is a factor in the etiology of "alveolar pyorrhea" but many studies have provided evidence that there is no such relationship. In patterns of study when acting occlusal trauma and there is available healthy periodontium (absent gingival inflammation or periodontal pocket formation), the results show varying degrees of functional adaptation to increasing occlusal forces.

A number of authors tend to accept Glickman's conclusions that trauma from occlusion is an aggravating factor in periodontal disease.

When a tooth is exposed to unilateral forces of a magnitude, frequency or duration that its periodontal tissues are unable to withstand, certain reactions develop in the periodontal ligament. These reactions eventually resulting in an adaptation of the periodontal structures to the altered functional demand.

If the crown of a tooth is affected by such horizontally directed forces, the tooth tends to tilt (tip) in the direction of the force. This tilting force results in the development of pressure and tension zones within the marginal and apical parts of the periodontium.



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The tissue reactions which develop in the pressure zone are characterized by increased vascular permeability, vascular thrombosis, and disorganization of cells and collagen fiber bundles. Bone-resorbing osteoclasts appear on the bone surface of the alveolus in the pressure zone. A process of bone resorption is initiated. The supra-alveolar connective tissue remains unaffected by force application.

Concomitant with the tissue alterations in the pressure zone, apposition of bone occurs in the tension zone in order to maintain the normal width of the periodontal ligament in this area.

The tooth moves (tilts) in the direction of the force. When the tooth is no longer subjected to the trauma, complete regeneration of the periodontal tissues takes place. There is no apical downgrowth of the dentogingival epithelium.

In orthodontic tilting (tipping) movements, neither gingival inflammation nor loss of connective tissue attachment will occur in a healthy periodontium and there is no apical migration of the dentogingival epithelium.

STAGES OF TISSUE RESPONSE WITH INCREASED OCCLUSAL PRESSURE AND HEALTHY PERIODONTIUM

Stage I – Injury:

- Varying degrees of pressure or tension create varying degrees of changes.

Slight pressure:

- resorption of bone
- widened periodontal ligament space
- blood vessels reduce in size.

Slight tension:

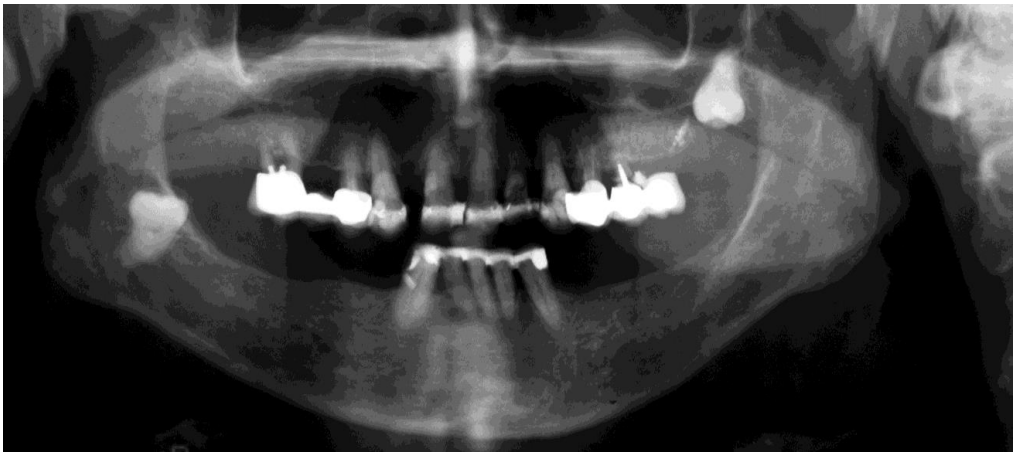
- periodontal ligament fibers elongate
- apposition of bone
- blood vessels enlarge.

Stage II – Repair

Reparative activity includes formation of new connective tissue cells and fibers, bone and cementum.

Stage III – Adaptive remodeling

With remodeling, forces may no longer be injurious to the tissues. The result is thickened periodontal ligament with no pocket formation.



Adaptive remodeling in region of upper incisors

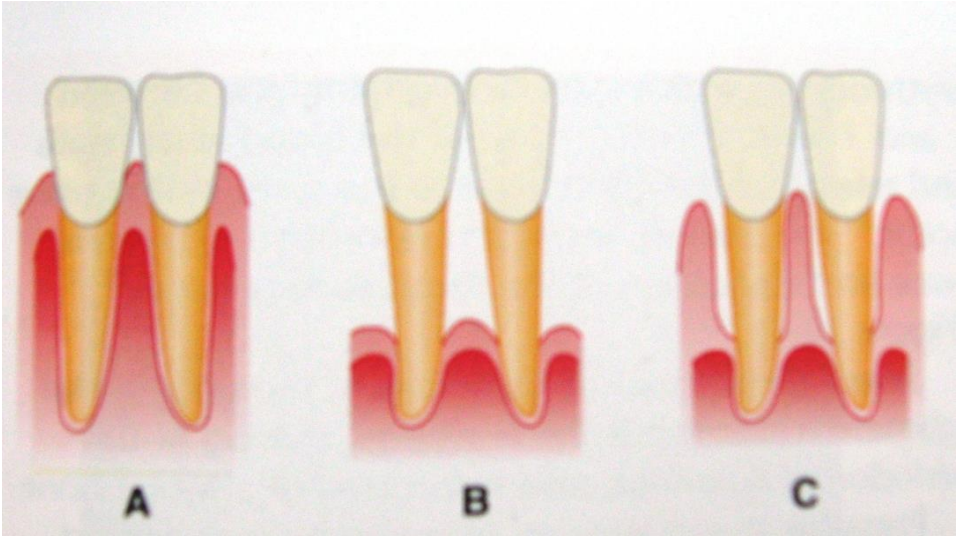
Trauma from occlusion is reversible

Repair or remodeling occurs if teeth can escape from force.

Inflammation inhibits potential for bone regeneration – inflammation must be eliminated.

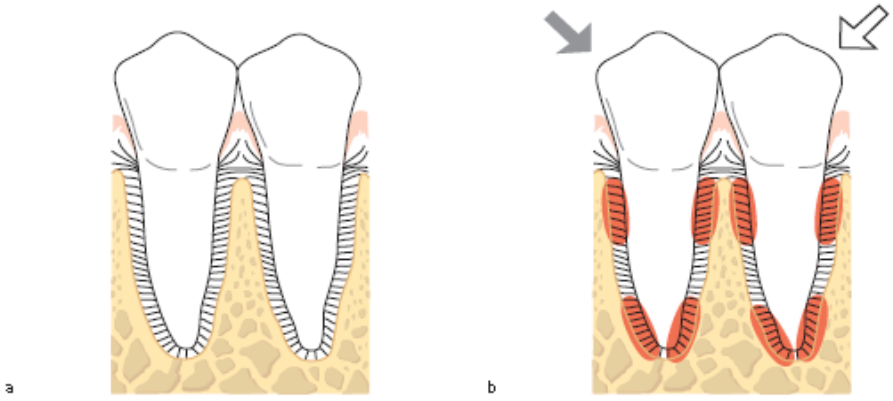
The supra-alveolar connective tissue is not affected by the force, either in conjunction with tipping or in conjunction with bodily movements of the tooth.

In secondary occlusion trauma, the adaptive capacity of the tissues to resist the occlusal pressure is altered by the loss of attachment and bone loss as a result of destruction with existing periodontitis. The periodontium becomes more vulnerable and the occlusal forces that were well tolerated before the injury in this situation become traumatic (B, C).



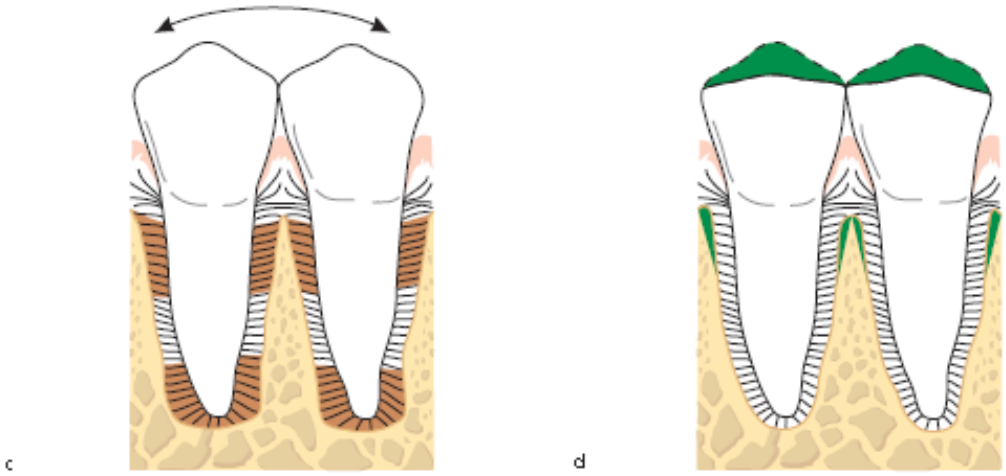
Carranza's Clinical Periodontology, Eleventh Edition, 2014

Effects of jiggling forces



Lindhe J, N Lang, T Karring, Clinical Periodontology and Implant Dentistry, 2008, Fifth Edition

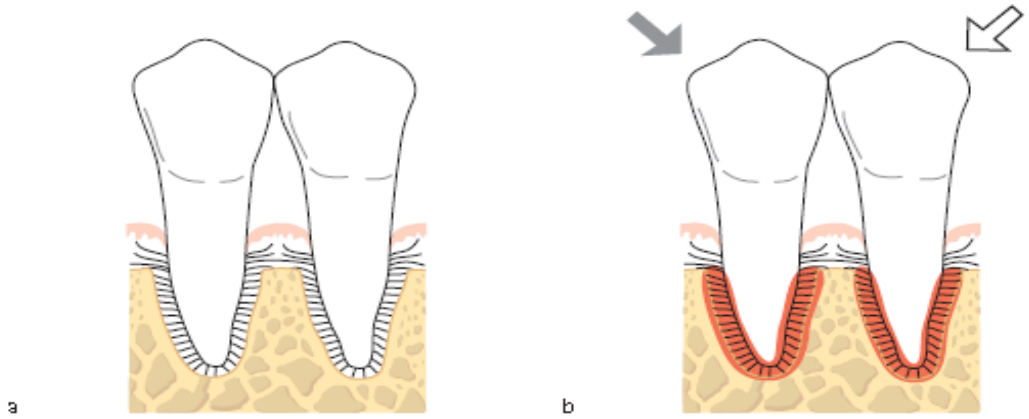
Two mandibular premolars with normal periodontal tissues are exposed to jiggling forces. The combined tension and pressure zones (encircled areas) are characterized by signs of acute inflammation including collagen resorption, bone resorption, and cementum resorption. As a result of bone resorption the periodontal ligament space gradually increases in size on both sides of the teeth as well as in the periapical region.



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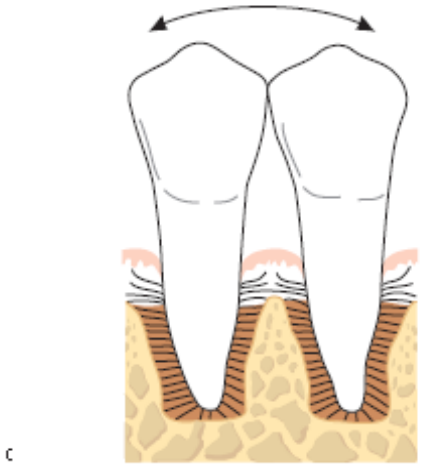
When the effect of the force applied has been compensated by the increased width of the periodontal ligament space, the ligament tissue shows no sign of inflammation. The supra-alveolar connective tissue is not affected by the jiggling forces and there is no apical downgrowth of the dentogingival epithelium. After occlusal adjustment the width of the periodontal ligament becomes normalized and the teeth are stabilized.

In experimental study:



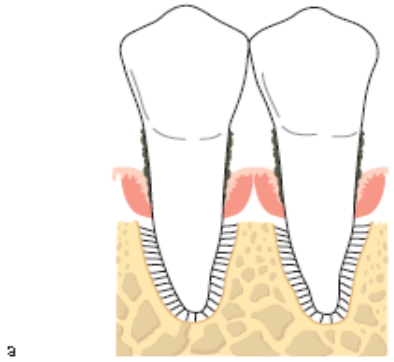
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(a) Two mandibular premolars are surrounded by a healthy periodontium with reduced height.
(b) If such premolars are subjected to traumatizing forces of the jiggling type a series of alterations occurs in the periodontal ligament tissue.
The periodontal tissues in the combined pressure and tension zones reacted to the forces by vascular proliferation, exudation, and thrombosis, as well as by bone resorption.



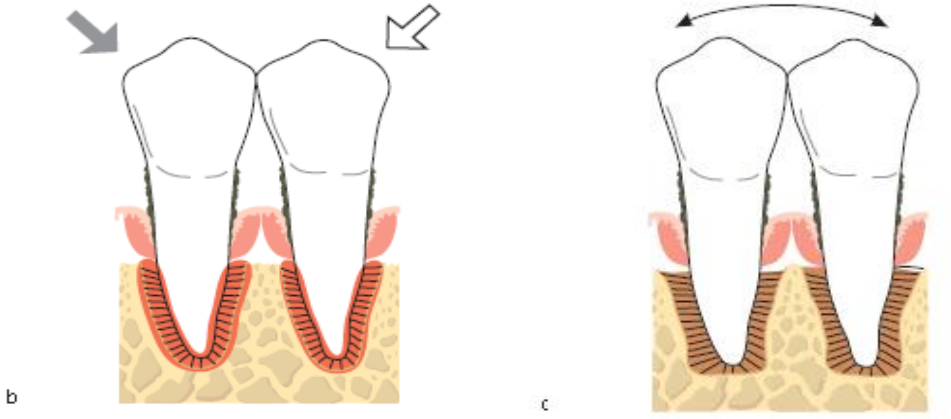
Lindhe J, N Lang, T Karring, Clinical Periodontology and Implant Dentistry, 2008, Fifth Edition
In radiographs – widened periodontal ligaments could be found.
At clinical examination – signs of progressive tooth mobility. Periodontal structures had adapted to the altered functional demands. There was no further loss of connective tissue attachment and no further downgrowth of dentogingival epithelium.

Plaque-associated periodontal disease



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(a)Two mandibular premolars with supra- and subgingival plaque, advanced bone loss and periodontal pockets of a suprabony character. The connective tissue infiltrate only in free gingiva (shadowed areas) and the uninflamed connective tissue between the alveolar bone and the apical portion of the infiltrate.

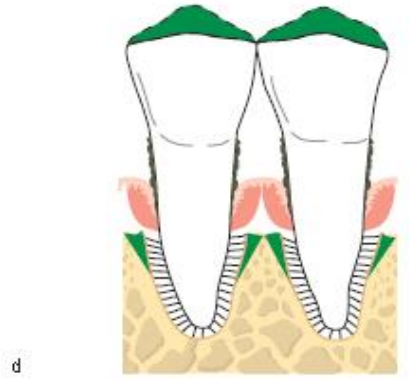


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(b) If these teeth are subjected to traumatizing forces of the jiggling type,

(c) These tissue alterations, which include bone resorption, result in a widened periodontal ligament space and increased tooth mobility but no further loss of connective tissue attachment than was caused by the plaque-associated lesion.

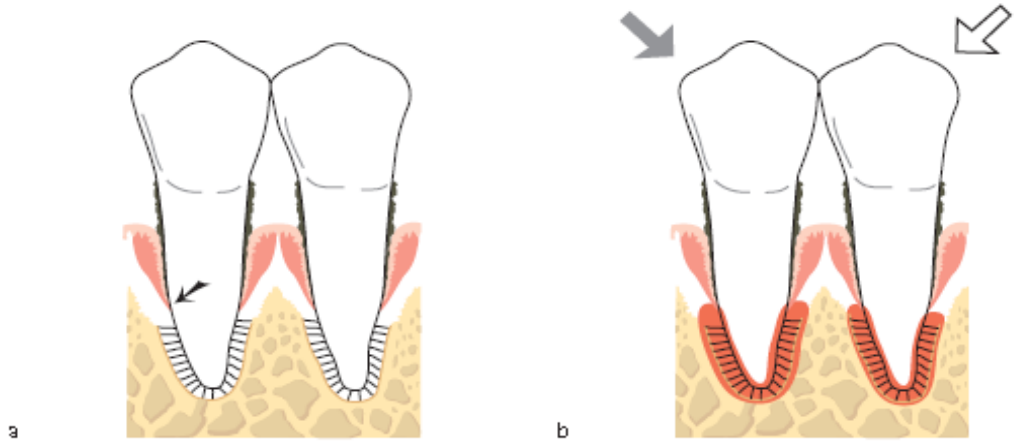
Occlusal forces which allow adaptive alterations to develop in the pressure/tension zones of the periodontal ligament will not aggravate a plaque-associated gingivitis.



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(d) Occlusal adjustment results in a reduction of the width of the periodontal ligament and in less mobile teeth.

Active periodontitis



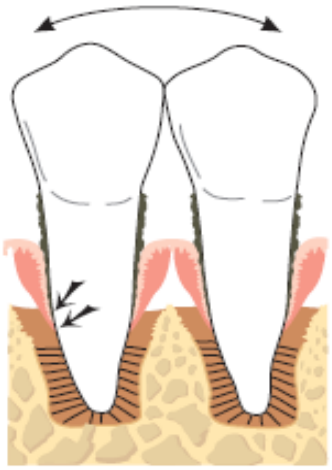
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If the magnitude and direction of the jiggling forces were such that, the tissues in the pressure/tension zones could not become adapted, the injury in the zones of co-destruction hadpermanent character. Osteoclasts residing on the walls of the alveolus maintained the bone

resorption, which resulted in a gradual widening of the periodontal ligament in the pressure/tension zones.

The resulting angular bone destruction was continuous and the mobility of the teeth remained progressive.

c



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The plaque-associated lesion in the “zone of irritation” and the inflammatory lesion in the “zone of co-destruction” merged; the dentogingival epithelium proliferated in an apical direction and periodontal disease was aggravated.



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(c) Occlusal adjustment will result in a narrowing of the periodontal ligament, less tooth mobility, but no improvement of the attachment level.

In summary:

Experiments carried out in humans and animals, have produced evidence that neither unilateral forces nor jiggling forces, applied to teeth with a healthy periodontium, result in pocket formation or in loss of connective tissue attachment. Trauma from occlusion cannot induce periodontal tissue breakdown.

Trauma from occlusion does result in resorption of alveolar bone leading to an increased tooth mobility which can be of a transient or permanent character. This bone resorption should be regarded as a physiologic adaptation of the periodontal ligament and surrounding alveolar bone to the traumatizing forces, i.e. to altered functional demands. In teeth with progressive, plaque-associated periodontal disease, trauma from occlusion may enhance the rate of progression of the disease, i.e. act as a co-factor in the destructive process.

Mechanical periodontal treatment (SRP) will arrest the destruction of the periodontal tissues even if the occlusal trauma persists. Treatment directed towards the trauma alone, however, i.e. occlusal adjustment or splinting, may reduce the mobility of the traumatized teeth and result in some regrowth of bone, but it will not arrest the rate of further breakdown of the supporting apparatus caused by plaque.

CLINICAL SYMPTOMS OF TRAUMA FROM OCCLUSION

Tooth mobility

Fremitus

Pain

Tooth migration

Attrition

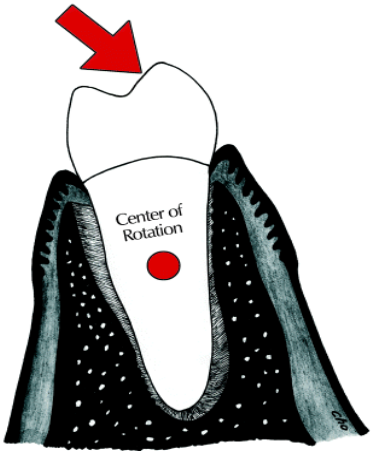
Muscle/Joint pain

Fractures, chipping.

1. Tooth mobility.

- occurs during injury stage (injured PL fibers)
- occurs during repair/remodeling (widened PL space)

Tooth mobility greater than normal, but not considered pathologic unless tooth mobility is progressive.



Hallmon, W. W., & Harrel, S. K. (2004). Occlusal analysis, diagnosis and management in the practice of periodontics. Periodontology 2000, 34(1).

When a relatively high force is applied to the tooth crown, its deviation in horizontal and vertical directions is evaluated. The tooth tilts in the alveoli until close contact is made between the root and the marginal or apical bone.

Tooth mobility can also be caused by (differential diagnosis):

Loss of tooth support

Extension of inflammation from the gingiva or pulp

Periodontal surgery

Pathology in jaws (tumors, osteomyelitis)

All teeth should be carefully palpated to determine mobility. Mobility is graded according to the extent of tooth movement (in a buccolingual direction (and mesiodistal direction) as follows (Index Miller):

Grade 0: physiological mobility (<0,3 mm)

Grade 1: slighty above normal <1 mm B – L

Grade 2: moderately above normal >1 mm to 2 mm

Grade 3: Mobility over 2 mm combined with a displacement in vertical direction (tooth can be intruded).



From: https://www.omicsonline.org/articles-images/dental-implants-dentures-Periotest-M-implant-bone-1-110-g004.png

The Periotest M device measures the reaction of the periodontium to a defined percussion force which is applied to the tooth by a tapping instrument.

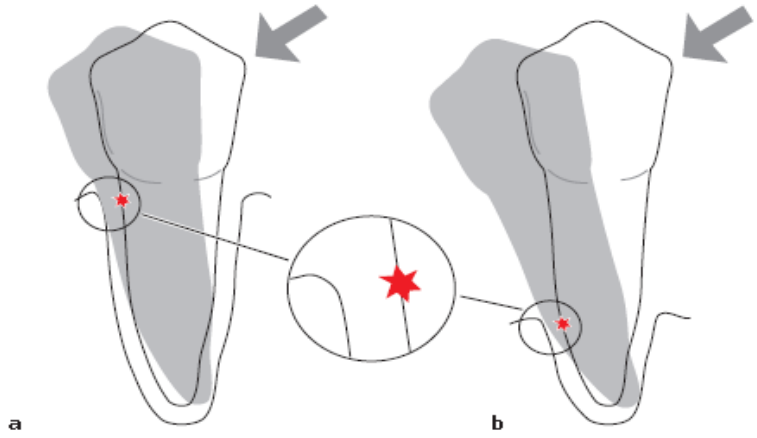
The contact time between the tapping head and the tooth varies between 0.3 and 2 milliseconds and is shorter for stable than mobile teeth. The Periotest scale (the Periotest values) ranges from−8 to +50. Lower values mean high stability of the tooth or implants.

Physiologic and pathologic tooth mobility

1. If applied horizontal occlusal force the healthy tooth will tip within its alveolus until a closer contact has been established between the root and the marginal (or apical) bone tissue.

The magnitude of this tipping movement is referred to as the "physiologic" tooth mobility.

2. An increased tooth mobility after force application, can also be found in situations where the height of the alveolar bone has been reduced (as a result of plaque-associated periodontal disease) but the remaining periodontal ligament has a normal width.



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(a) The normal “physiologic” mobility of a tooth with normal height of the alveolar bone and normal width of the periodontal ligament.
(b) The mobility of a tooth with reduced height of the alveolar bone.

The movement of the root within the space of its remaining “normal” periodontal ligament is normal. Clinical measurements are regarded as physiologic.
3. Increased crown displacement (tooth mobility) may also be detected in a clinical measurement where a “horizontal” force is applied to teeth with angular bony defects and/or increased width of the periodontal ligament, but normal composition. If this mobility does not increase gradually – from one observation interval to the next – this mobility should also be considered physiologic.
4. Only progressively increasing tooth mobility, which may occur in conjunction with trauma from occlusion, is characterized by active bone resorption and which indicates the presence of inflammatory alterations within the periodontal ligament tissue, may be considered pathologic.



Radiography of progressive tooth mobility. Clinical case (T. Bolyarova)

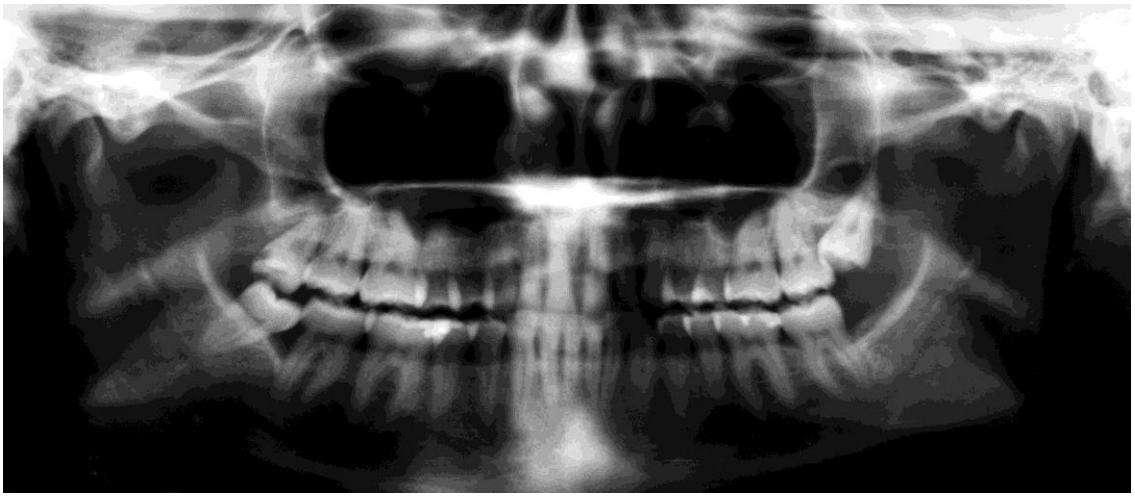
2. Fremitus.

In dentistry, a vibration palpable when the teeth come into contact. Identifying fremitus only requires placing the tip of our index finger lightly on the facial surfaces of the teeth and asking patient to “tap-tap,” gently and firmly. If you feel any movement or vibration – fremitus is present.

3. Migration of tooth.

The movement of teeth in to altered positions in relationship to the basal bone of the alveolar process and adjoining or opposing teeth as a result of loss of approximating or opposing teeth, occlusal interferences, habits (pushing with the tongue, position of the lips, bruxism), or inflammation-destructive disease of the supporting structures of the teeth. Moving the upper incisors is a common reason for seeking dental care.





Migration of tooth. Dense contacts in the region of the incisors. Clinical case (T. Bolyarova)

To clarify the reason for the migration of the teeth.

4. Dental pain or discomfort when chewing or percussion.

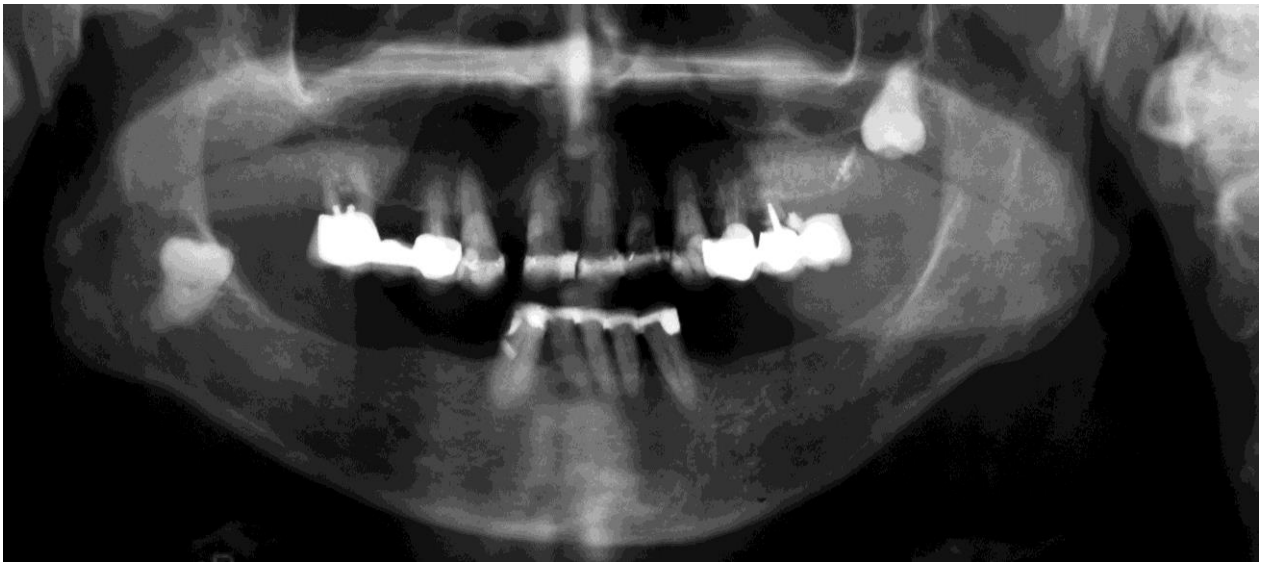
5. Muscle pain when chewing or other symptoms of temporomandibular dysfunction.

6. Presence of facets of deleting more than expected for age and texture of food.

7. Enamel fracture or fracture of crown or root.

RADIOGRAPHIC SIGNS OF TRAUMA FROM OCCLUSION:

- widened periodontal ligament space
- vertical defects
- thickened lamina dura
- hypercementosis
- root fracture/resorption.





Widened periodontal ligament space. Clinical case (T. Bolyarova)

Features to be observed about occlusion include:

• premature contacts

• overerupted teeth

• deep traumatic overbites.

TREATMENT OF TRAUMA FROM OCCLUSION

Therapeutic goals – to maintain the periodontium in comfort and function.

Periodontal inflammation alone can contribute significantly to a tooth's mobility. For these reasons when treating periodontal patients with occlusal issues the first aim of therapy should be directed at alleviating plaque-induced inflammation. Once this has been accomplished, efforts can then be directed at adjusting the occlusion. This may result in a decrease in mobility, decrease in the width of the periodontal ligament space, increase in overall bone volume.

A number of treatment considerations must be considered including one or more of the following:

1) Occlusal adjustment.

2) Management of parafunctional habits.

3) Temporary, provisional or long-term stabilization of mobile teeth with removable or fixed appliances.

4) Orthodontic tooth movement.

5) Occlusal reconstruction.

6) Extraction of selected teeth.

Interocclusal Appliance Therapy

Interocclusal appliances generally fabricated of hard acrylic resin; have the advantage of providing a reversible means of redistributing occlusal forces and minimizing excessive force on individual teeth.

Interocclusal appliances**:**

Redistribute occlusal forces.

Are effective in the treatment of bruxism.

Have a favorable effect on the masticatory muscles and bones.

In patients with periodontal disease contributes to chewing comfort, reduce the destructiveness of occlusal parafunctions, improve the overall prognosis.

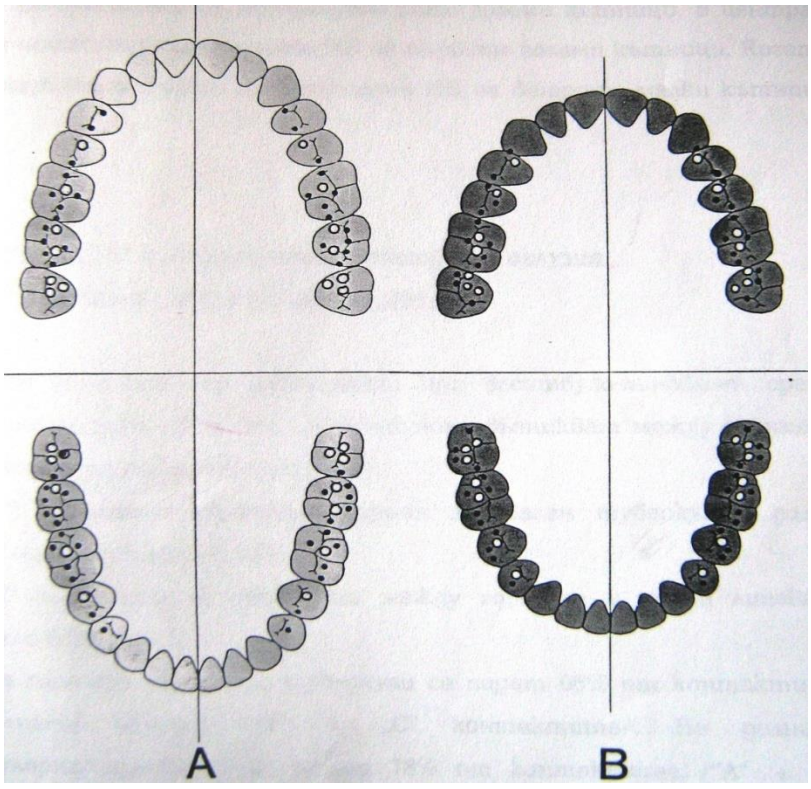
Occlusal adjustment

Definition: Selective grinding of occlusal (i.e., masticatory) surfaces of the teeth to eliminate premature contacts and occlusal interferences. (Medical Dictionary for the Health Professions and Nursing © Farlex, 2012)

Occlusal adjustment (Occlusal equilibration or Selective grinding) is reshaping the occluding surfaces of teeth by grinding to create harmonious contact relationships between the upper and lower teeth. (Glossary of Periodontal Terms, 2001).

Occlusal adjustment is indicated when there are: occlusal contacts that cause injury of periodontium, TMJ, muscle or soft tissue; contacts which deepening parafunctions; in addition to splinting of teeth.

Aims of the occlusal adjustment:

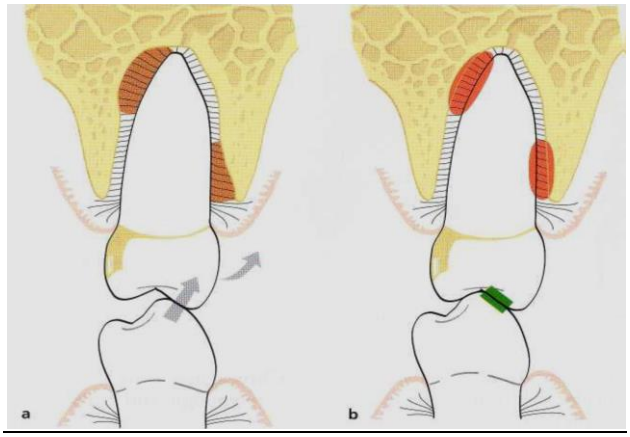


In central occlusion exist dense (o) and weak (●) contacts.

The number of dense contacts increases in distal direction (Filchev, A.).

Increased dental mobility and its treatment.

I. Treatment of increased mobility of a tooth with increased width of the periodontal ligament but normal height of the alveolar bone:

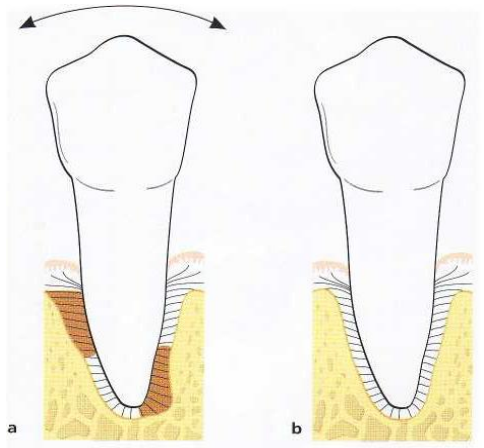


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(a) higher restoration. Occlusion results in horizontally directed forces (arrows). Resorption of the alveolar bone occurs in these areas with occlusal stress (in brown). A widening of the periodontal ligament can be detected as well as increased mobility of the tooth.

(b) Following adjustment of the occlusion, the horizontal forces are reduced. This results in bone apposition ("red areas") normalizing the width of the periodontal ligament and a normalization of the tooth mobility.

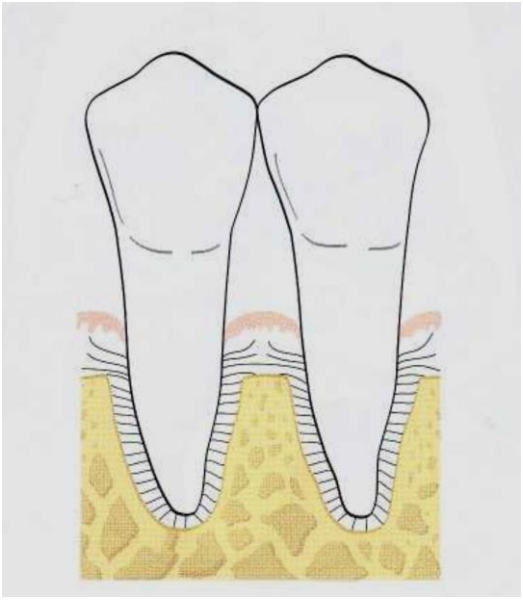
II. Treatment of Increased mobility of a tooth with increased width of the periodontal ligament and reduced height of the alveolar bone.



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If a tooth with a reduced periodontal tissue support is exposed to excessive horizontal forces (trauma from occlusion), bone resorption and widening of periodontal ligament ("brown" areas) is develop. The tooth becomes hypermobile.
If the excessive forces are reduced or eliminated by occlusal adjustment, bone apposition to the "pretrauma" level will occur, the periodontal ligament will regain its normal width and the tooth will become stabilized.
Conclusion: Occlusal adjustment is an effective therapy against increased tooth mobility when such mobility is caused by an increased width of the periodontal ligament.

III. Increased mobility of a tooth with reduced height of the alveolar bone and normal width of the periodontal ligament cannot be reduced or eliminated by occlusal adjustment.



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Splinting – after the initial therapy, when increased tooth mobility as a result of reduced height of the alveolar bone can be accepted. Splinting provide stable occlusion (no further migration or further increasing mobility of individual teeth).
Splinting is indicated when the mobility of a tooth or a group of teeth is increased and chewing ability and/or comfort are disturbed.

IV. Progressive (increasing) mobility of a tooth (teeth) as a result of gradually increasing width of the reduced periodontal ligament

There is an obvious risk that the forces elicited during function may cause extraction of the teeth. It will only be possible to maintain such teeth by splint. In such cases a fixed splint has two objectives:

1) to stabilize hypermobile teeth and

2) to replace missing teeth.

Splinting is joining the mobile tooth/teeth together with other teeth in the jaw into a fixed unit.

When splinting is done?

Splinting is done in the corrective phase of periodontal treatment – after being eliminated inflammation and reduced the depth of periodontal pockets.

A splint can be fabricated in the form of:

- joined composite fillings, fixed bridges, removable partial prostheses, etc.

Indications for Splinting (1989 World Workshop in Periodontics):

1) Stabilize teeth with increasing mobility that have not responded to occlusal adjustment and periodontal treatment.

2) Stabilize teeth with advanced mobility (II, III degree) that have not responded to occlusal adjustment and treatment when there is interference with normal function and patient comfort.

3) Facilitate treatment of extremely mobile teeth by splinting them prior to periodontal instrumentation and occlusal adjustment procedures.

4) Prevent tipping or drifting of teeth and extrusion of unopposed teeth.

5) Stabilize teeth, when indicated, following orthodontic movement.

6) Create adequate occlusal stability when replacing missing teeth.

7) Splint teeth so that a root can be removed and the crown retained in its place.

8) Stabilize teeth following acute trauma.

Increased mobility of a tooth with reduced height of the alveolar bone and normal width of the periodontal ligament (2. of indications)



Clinical case (T. Bolyarova):

Trauma from occlusion in a patient with moderate periodontitis and mobility Grade II.

Female patient, 50 years old with periodontitis, PD in the range from 3 mm to 5 mm, while in the tooth 13, 14 – 9 mm and in tooth 15 – 6 mm. The average Clinical attachment loss (AL) is 3 mm, but in region of tooth 13, 14 and 15 AL reaches respectively 10 mm, 10 mm, 6 mm.
The mobility of the upper right premolars is second degree, and the mobility of the first molar is first degree (index Miller). The second premolar on the right side of the lower jaw is prosthesized with metal-ceramic crown, which is in preliminary contact with the first premolar of the upper jaw. Availability of bruxism and secondary occlusal trauma.



X-ray shows greater bone loss in region of teeth 13, 14, 15 and normal width of periodontal ligament space. Clinical case (T. Bolyarova).

Treatment:

1. Scaling & root planning, oral hygiene instruction.
2. Occlusal adjustment – a stable, non-traumatic occlusion.

Assessment after the initial phase shows elimination of the inflammation and not changed tooth mobility – second degree.

Indication for splinting – reduced periodontal support, mobility of the teeth, which is not reduced after the initial phase of therapy and causes discomfort to the patient.



Clinical case (T. Bolyarova)

In the corrective phase of periodontal therapy was made splint of connected metal fillings on the palatal and occlusal surfaces of the teeth 13, 14, 15, 16.

The metal restorations repeat the contour of teeth and interproximal splint connections do not reach the papilla. There is access for cleaning with interdental brushes.



Clinical case (T. Bolyarova)

Five months after treatment: There are normal occlusal relationships and good oral hygiene. Good clinical and radiographic results are achieved. Clinically – the teeth are stabilized. Subjective – no patient discomfort.



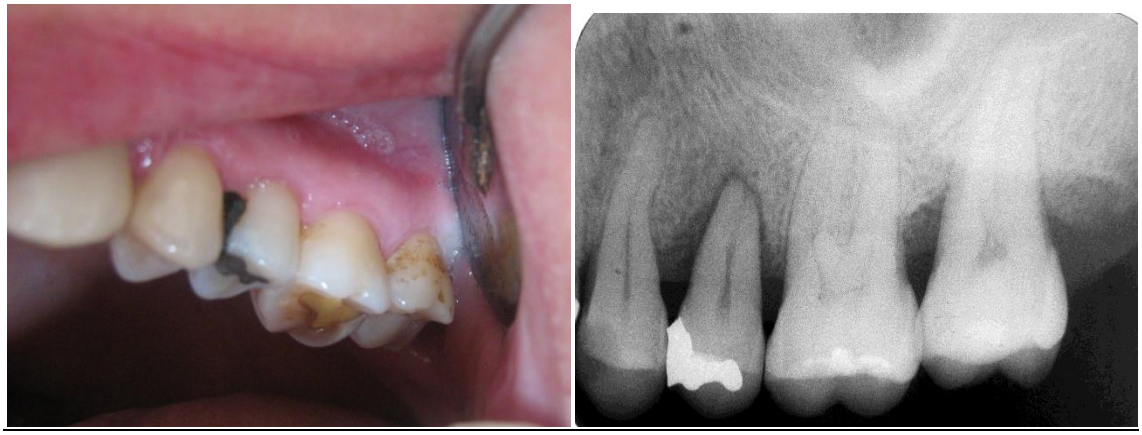
Initial radiography



Radiography five months after treatment

Radiography shows bone apposition at the bottom of the defect.

Progressive (increasing) mobility of a tooth (teeth) as a result of gradually increasing width of the reduced periodontal ligament (1. of indications).



Clinical case (T. Bolyarova)

Patients with moderate periodontitis and combined occlusal trauma (high metal-ceramic crown on tooth 35) and mobility of tooth 25 II degree. Following a periodontal treatment and endodontic treatment of the affected tooth, mobility of the teeth is not reduced.



Stabilizing teeth with molded metal splint.

Radiographic changes:



Initial radiography



After endodontic treatment



After splinting



One year after splinting



Three years after splinting.

Facilitate treatment of extremely mobile teeth by splinting them prior to periodontal instrumentation and occlusal adjustment procedures. (3. of indications).

Clinical case (T. Bolyarova, G. Micheva):







Patient with severe periodontitis and mobility of the frontal teeth second degree.

Create adequate occlusal stability when replacing missing teeth (6. of indications).

Clinical case (T. Bolyarova)



Treatment.

Initial phase of periodontal therapy (SRP). Endodontic treatment of tooth 15. Regenerative therapy.





One year after surgery.





Placement of a temporary construction of teeth 13, 14, 15, 17. Orthodontic treatment. Placement of a permanent construction splint-bridge of teeth 13, 14, 15, 17 and replace the missing tooth 16. Splinting of frontal teeth – 12, 11, 21, 22, 23. Clinical case (T. Bolyarova)

Contraindications for Splinting (1989 World Workshop in Periodontics):

1) When the treatment of inflammatory periodontal disease has not been accomplished.

2) When occlusal adjustment to reduce trauma and /or interferences has not been previously decided.

CONCLUSION:

Primary trauma from occlusion is reversible upon reduction of the occlusal forces. In existing periodontitis, trauma from occlusion is co-factor which can accelerate the progression of the periodontal disease.

Occlusal therapy should be considered an adjunct to periodontal therapy. She is performed along with conventional methods of treating plaque-induced inflammation in periodontal disease.