

## Tooth mobility

Is loosening of a tooth in its socket & it is of two types physiologic and pathologic mobility

**Physiologic mobility:** refers to a large force exerted on the crown of a tooth surrounded by a healthy and intact periodontium, in which the tooth show tipping movement or it will tip within its alveolus until a closer contact has been established between root and marginal or apical bony tissue

- All teeth have a slight degree of physiologic mobility, which varies for different teeth and at different time of the day
- It is at the greatest on arising in the Morning and progressively decreased afterward
- This increased mobility is attributed to the extrusion of the tooth because of limited occlusal contact during sleep
- During the waking hours, mobility is reduced by chewing and swallowing forces which intrude the teeth in the sockets
- In addition, this mobility is less marked in persons with healthy periodontium than in those with occlusal habits such as bruxism and clenching



- Displacement of crown of the tooth can be increased by force application when the height of the alveolar bone is reduced but the remaining PDL have a normal width

### Pathological mobility

Is the progressive increasing tooth mobility, which may occur in conjunction with trauma from occlusion, is characterised by active bone resorption and indicates a presence of inflammatory alterations within the PDL

- Teeth mobility may be in horizontal or vertical direction

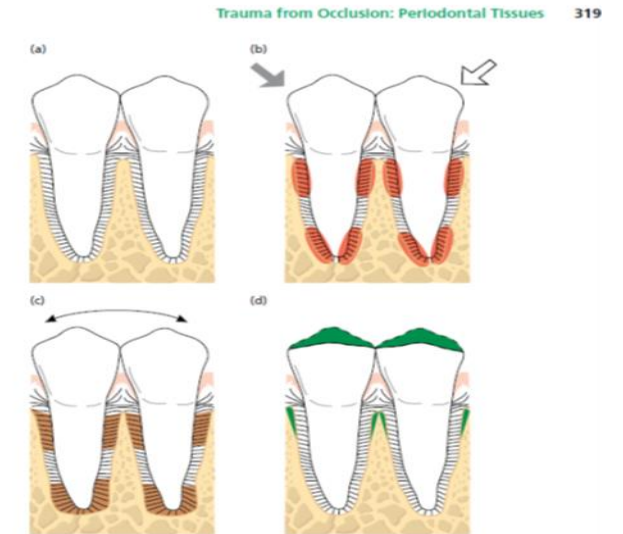


Fig. 16-7 Two mandibular premolars with normal periodontal tissues (a) are exposed to jiggling forces (b), as illustrated by the two arrows. The combined tension and pressure zones (encircled areas) are characterized by signs of acute inflammation, including collagen resorption, bone resorption, and 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. (c) When the effect of the force applied has been compensated for by the increased widths of the periodontal ligament space, the ligament tissue shows no signs of inflammation. The supra-alveolar connective tissue is not affected by the jiggling forces and there is no apical down-growth of the desmogingival epithelium. (d) After occlusal adjustment the width of the periodontal ligament becomes normalized and the teeth are stabilized.

### Horizontal tooth mobility

Is the ability to move the tooth in a facial-lingual direction in its socket.

- It is assessed by putting the handles of two dental instruments on either side of the tooth and applying moderate pressure in the facial-lingual direction against the tooth



## Vertical tooth mobility

Is the ability to depress the tooth in its socket, and can be assessed using the end of an instrument handle to exert pressure against the occlusal or incisal tooth surface

## Causes of tooth mobility

### 1- Advanced periodontal diseases and loss of supporting bone

Normally the crest of alveolar bone located about 1-2mm shorter than CEJ

- The amount of mobility depends on the severity of bone destruction and there will be a reduction in the height of bone

### 2- Gingival and periodontal inflammation

Mobility will occur by increase the infiltration of inflammatory excaudate fluid within the connective tissue

### 3- Trauma from occlusion

It is injury to the tissue produced by excessive occlusal forces or habits such as bruxism or clenching, which is a common cause for increased tooth mobility

- The pathological changes that occur because of trauma from occlusion are widening of periodontal ligament space and or destruction of the bone surrounding the root

### 4- Immediately following periodontal therapy

May cause transient mobility for a short period of time because of the surgical trauma ( physical rather than bacterial) due to using of surgical instruments

- After 2-3 weeks, the mobility will disappear if the diagnosis, treatment plan and maintenance phase were done properly

### 5- Pulpal inflammation

Spread of inflammation from periapical area to the periodontal ligament may results in changes that increase tooth mobility

## Factors that govern tooth mobility in a horizontal direction

- 1- The width of the periodontal ligament space ( it is about 0.25mm determined by x-ray)
- 2- The height of alveolar bone (is 1mm apical to the CEJ)
- 3- Number of roots (multirooted teeth are less subjected to mobility than single rooted teeth)
- 4- The shape of the roots (short tapered shape root is more susceptible to mobility than normal size and wide roots)
- 5- The degree and duration of the applied force whether in normal or abnormal function

## Classification of tooth mobility (TM)

TM is graded according to the following criteria:

**Grade I:** is the mobility of the crown 0.2-1mm in horizontal direction

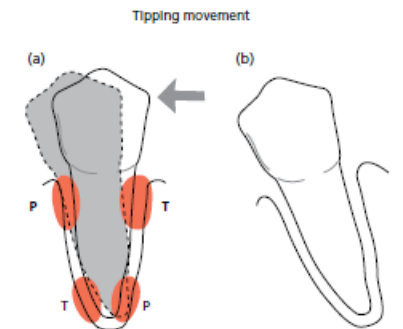
**Grade II:** mobility of the crown of the tooth exceeding 1mm in horizontal direction

**Grade III:** mobility of the crown of the tooth in vertical direction as well and the tooth becomes even depressed in its socket

## Initial and secondary tooth mobility

A tooth which is surrounded by normal periodontium may be moved in horizontal and vertical directions may be forced to rotational movements

- clinically, tooth mobility is assessed by exposing the crown of the tooth to a certain force and determine the distance that the crown can be displaced buccal and or lingual direction
- The mechanism of TM was studied in details by Muhlemann (1954, 1960) who described a standard method for measuring even minor tooth displacement by means of periometer with a small force (100 pounds) is applied to the crown of a tooth
- The crown started to tip in the direction of the force and the crown is moved only 0.05-0.1mm
- This movement of the tooth is called initial tooth mobility (ITM), which is the result of intra alveolar displacement of the root
- In this movement there is pressure and tension zone
- In the pressure zone there is 10% reduction in the width of periodontal ligament and in the tension zone there is a corresponding increase
- In the ITM there is reorientation of the PDL fibres into a position of functional redness towards tensile strength and it differs from an individual to another and from tooth to tooth



- When large force (500 pounds) is applied to the crown, the fibre bundles on the tension side can not offer sufficient resistance to further root displacement
- The additional displacement of the crown is called **secondary tooth mobility (STM)**, which is allowed by distortion and compression of the periodontium in the pressure side
- The displacement of the crown with 500 pounds force applied may vary between teeth:

Incisors 0.1-0.12mm

Canines 0.05-0.09mm

Premolars 0.08-0.1mm

Molars 0.04-0.08mm

- This displacement found to be larger in children than adults and is larger in females than males (which increase more in pregnancy)

## Signs and symptoms of **TM**

### 1- Patient awareness of mobility

Mobility is detected quite incidentally when patient's attention is brought to tooth by tenderness experienced on chewing

## 2- Functional discomfort

Pain may be expected following sudden tooth displacement when biting on hard food or with inadvertent trauma

## 3-Aesthetic

Anterior labial or lateral tooth displacement results in elongation of clinical crown with poor appearance

## Treatment of increased tooth mobility

**Situation I:** increased mobility of a tooth with increased width of PDL but normal height of the alveolar bone

This case is seen in teeth with improper filling or crown restoration (high spot), which may lead to occlusal trauma

- This leads to increase the width of the PDL
- The PDL can physiologically adapt to this force without pocket formation
- In such case the bone resorption is a reversible process
- **The treatment can be carried out by elimination of occlusal interference**



**Situation II:** increased mobility of a tooth with increased width of PDL and reduced height of alveolar bone

- This case can be seen when teeth are properly treated for plaque associated periodontal disease, gingival health is established, however; periodontal structures are reduced
- Trauma from occlusion is seen when teeth are exposed to excessive horizontal forces and teeth become mobile
- Treatment in this case is **by occlusal adjacement and elimination of the excessive force or reduce it**
- Bone apposition will occur and the PDL will regain its width and the tooth will be stable

**Situation III:** increased mobility of a tooth with reduced height of alveolar bone and normal width of PDL

In teeth with normal width of PDL, no further bone apposition can occur

- If such an increased tooth mobility does not interfere with the patient chewing function or comfort, no treatment is required
- If the mobility disturb the patient so it can be treated by splinting and joining the mobile teeth with other teeth either by using composite fillings, fixed bridges

**Situation IV:** progressive increasing mobility of teeth as a result of gradually increasing width of PDL in teeth with reduced height of alveolar bone

This case can be seen in advanced periodontal disease, the tissue destruction may reach a level where extraction of one or several teeth can be avoided

- Teeth that remaining in such dentition are still available for periodontal treatment which may exhibit a progressively increasing mobility by force applied during function which disrupt the remaining PDL
- **Treatment is only by fixed splint to stabilize the hyper mobile teeth and to replace missing teeth**

**Situation V:** Increased bridge mobility despite splinting

In patient with advanced PD disease, the destruction of the periodontium has progressed to varying levels around different teeth and tooth surfaces in dentition

- Following proper treatment of the plaque-associated lesions, often including multiple extraction, the remaining teeth may display extreme reduction of the supporting tissues with increased tooth mobility and they may be distributed in the jaw in such a way that makes it difficult or impossible to obtain proper splinting effects even by means of cross-arch bridge and entire bridge/splint may exhibit mobility

An increased mobility of a cross-arch bridge/ splint can be accepted providing that the mobility does not disturb chewing ability or discomfort and the mobility of the splint is not progressively increasing