

Teeth Mobility Cause and Management of Mobile Teeth in Dental Clinic

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Abstract

By examining firm pressure with two metal instruments on teeth, the extent of vertical and horizontal displacement considered as tooth mobility, which is due to either periodontal disease or trauma. Nowadays teeth mobility is a common problem in dental scenarios, which results in occlusal problems, Dietary problems, and disturbances in mastication, aesthetic problem and worsening life quality. The treatment of tooth mobility is based on its etiology; it may be surgical or non-surgical. Surgically by Periodontal surgery, non-surgically by occlusal adjustment and splinting. Sometimes the Occlusal adjustment can be done by the surgical process. In the article, we discuss the cause of tooth mobility, relation between tooth mobility and occlusion including indication, contraindication and principles of tooth splinting. Our ultimate goal is to restore mastication function, good aesthetic, to improve patient comfort and good oral functions by various periodontal treatments for the management of mobile teeth.

Keywords: *Teeth Mobility, Adjustment Occlusion, Periodontal Splinting, Trauma of Periodontium, Types of Splinting.*

Introduction

Periodontitis is the most common and harmful disease among all periodontal diseases. It affects both soft tissue, hard tissue and tooth-supporting structures due to which tooth mobility occurs. By firm pressure of the dentist by using an instrument, the horizontal and vertical displacement of teeth is accepted as teeth mobility. Assessment of the mobility of the tooth is considered an integral part of the periodontal diseases as it is one of the essential signs of the diagnosis of periodontal disease. The primary objective of periodontal treatment is the reduction of tooth mobility.¹

According to Miller's tooth mobility index it is graded as Grade-1, Grade-2, Grade-3. By using Miller's tooth mobility index, treatment plan and prognosis rate can be forecasted. Many factors are there which cause tooth mobility like inflammatory condition of periodontal tissue, PDL widening, alveolar bone loss, trauma from occlusion, loss attachment.²

Factors causing teeth mobility: Due to functional or parafunctional habits the force generated causes

damages of periodontium which is otherwise called as occlusal trauma. Occlusal trauma is of two types.

- i. Primary occlusal trauma
- ii. Secondary occlusal trauma

Primary occlusal trauma: The etiology of primary occlusal trauma is due to the pathological occlusal forces which cause abnormality in the periodontium.

Secondary occlusal trauma: In some conditions the periodontium which is already inflamed, bone loss already occurred and there is a pre-existing disease in periodontium but still the healthy periodontium bears the occlusal forces. The mobility of teeth depends on the frequency and direction of the occlusal forces. Other factors that cause teeth mobility are accidental trauma, Periapical endodontic lesion, high filling, orthodontic treatment during pregnancy. Mobility also depends on the number and distribution of remaining teeth in the jaw. Root shape, number of roots, root position, inter radicular bone, and root amputation case also affect teeth mobility.³

Mobile Teeth Treatment: Mobile teeth treatment is based on its aetiology. Splinting occlusal adjustment and treatment is based on the stage of periodontitis. Reduction of mobility can be done by healing of the inflamed Periodontium or reduced Periodontal disease. Splinting is just a supportive part in periodontal treatment therapy. Periodontitis can be treated both surgically and non surgically. In some cases occlusal adjustment is enough. In miller Grade-II mobility teeth need both occlusal adjustment and periodontal treatment with splinting procedure. In some cases splinting is necessary where Grade-II mobility of teeth is seen but extraction is not indicated.⁴

Occlusal adjustment: Occlusal adjustment is the process in which by grinding the occlusal surface of maxilla and mandible free form contact between upper and lower jaw is created. To increase occlusal stability occlusal therapy is required in any stage of periodontitis.⁵

Indication:

- In Fremitus positive case within increasing teeth mobility due to traumatic forces.
- In case of occlusal discomfort and masticatory function
- Grinding and reshaping of teeth due to which soft tissue injury happens.
- Reshape and adjustment of marginal ridge, proximal contact and cusps where food impaction is seen.
- As an accessory therapy which can mitigate harm caused by para-functional behaviors.

Contra Indication:

- In the case where there are no signs, symptoms of occlusal trauma.
- In a mentally disabled, mentally abnormal patient.
- Occlusal adjustment has no effect where there is severe malposition of teeth and mobility.
- It is not applied as the primary treatment of microbial induced periodontitis.⁶

Splinting:

Principles of splinting: To reduce the three-dimensional movement of teeth splinting is required. Splinting is the clinical procedure in which adjoining the adjacent tooth using mechanical stabilization objects to control reversible and irreversible mobility of

teeth. Splinting has the unique criteria of mobile teeth stabilization, decrease in tooth mobility and increase in masticatory and occlusal function. Due to good outcomes and better prognosis rates in periodontal diseases, splinting is most important due to its ability to give stability of teeth in between the surrounding periodontal structure of teeth. Before periodontal surgery and to improve the post-surgical healing splinting helps to the migrated teeth to reposition in a favorable environment by repairing periodontal tissue and tooth surrounding components. The skill of the clinician is needed for the successful splinting. The teeth marginal fit, contour of teeth, cleanability, retention, good joints of solder and esthetics are the technical elements of splinting. For the improvement of the masticatory force, occlusal force and patient comfort splinting has a great role. Splinting helps in deflecting the occluding and physiological force to other teeth which help in protecting the mobile teeth, reduction of traumatism, inhabitation of periodontal tissue regeneration and repairing. There is a previous history of healing of non-mobile teeth as well as mobile teeth, when mobile teeth are splinted. In the case of aggressive periodontitis by periodontal surgery and splinting help in the regeneration of bone and inhibit healing. The purpose of splinting is tissue protection, occlusal force distribution, mastication comfort, protection of investing teeth structure, pulp protection, stress, and force control. In performs in evaluation procedure anchorage, stabilizing in minor teeth movement. It helps in the prevention of teeth drifting while therapy is ongoing. In disease dentition it gives comfort by tooth stability.⁷⁻⁸

Indication and condition: In various clinical scenarios benefit of splinting is seen but the main objective of periodontal treatment is to create an environment where both movement occurs within the physiological limit for patient comfort and satisfactory function.

Indication: The main objective of splinting is to provide adequate rest while the healing process is ongoing and functional movement where the supportive tissue cannot perform satisfactorily.

- To relocate the teeth which is migrated due to periodontal problem
- When TFO is developing, In case of moderate to severe periodontal splinting required with addition to occlusal adjustment.

- In some surgical and non-surgical periodontal treatment procedures, where without stabilizing the mobile teeth treatment is difficult to operate. Before treatment by splinting extremely mobile teeth, it gives a good prognosis rate.
- After periodontal surgery the micro-movement of the teeth is seen in the healing area. So to eliminate the micro movement and increase the repair rate splinting is necessary.
- Splinting is done either for a single tooth or for entire dentition where extraction and implant is not indicated.
- After orthodontic treatment and after avulsion of teeth splinting prevent drifting of teeth.
- Splinting is helpful to increase the stability of joining, elimination, and reduction in teeth mobility and to get rid of pain and discomfort.⁹⁻¹⁰

Contra Indications:

- Without minimum periodontal condition and stability of occlusion splinting is not recommended.
- If the diagnosis of inflammatory periodontal disorder is not tackled splinting is not recommended.¹¹

Biomechanics: In periodontitis associated teeth mobility the mesiodistal, lateral, occlusal and intrusive forces cause tissue destruction because all the forces they don't direct on the long axis of teeth and the forces alter the center of rotation of affected teeth. By occlusal adjustment the occlusal force is reduced which helps in the reduction of teeth mobility before splinting. By altering the center of rotation of every teeth and by creating a multi-rooted unit all the forces acting on teeth is reduced. Thus root resistance, mesiodistal force resistance and periodontal resistance are achieved. Splinting guarantees a fair distribution of force by focussing force over the dispersed region with sufficient periodontal help. When two single-rooted teeth are splinted, the mesiodistal force is well distributed. For splinted areas, invasive forces are easily accepted as the forces affect spreads over a small number of key periodontal fibers. Splinting stretches across the arch to connect posterior and anterior segments or to include teeth in the opposite side of the arch such that anteroposterior forces and faciolingual forces are counteracted to achieve a desirable stabilization in the faciolingual and mesiodistal direction.¹²

Splinting disadvantage: Oral hygiene accessibility and plaque control is difficult after splinting. It is noticed that due to plaque accumulation in the splinted margin it cause gingival irritation and periodontal problem in case of the periodontally compromised patient. Long term splinting causes dental caries in the proximal, gingival caries due to the accumulation of food debris. Crown loosening, fracture of anterior teeth sometimes happens. Splinting causes a phonetic problem.¹³

Requirements on splinting:

- Splinting will add as many strong teeth as possible to decrease the extra pressure on single teeth to a minimum.
- Teeth kept rigid by splint and splint does not place torsional stress on any portion of the teeth.
- By extend around the arch splint opposes the anteroposterior and faciolingual forces.
- Splint does not mean to mess with occlusion.
- Before splinting the teeth should reposition to a harmonic order if possible.
- Pulp should not be irritated by splint.
- Soft tissue, gingival, cheeks and tongue, lips should not be irritated by splinting application.
- The design of splint should be like that the patient can easily clean it.
- Splint should not block the interdental area between the teeth.
- Instead of the above-required criteria others are medically acceptable, inexpensive, ease of fabrication, easily removable by the operator and esthetically acceptable.¹⁴

Splints classification

- Various techniques are there for the splinting of teeth. Splinting is classified according to its duration of use, purpose teeth location on the jaw, fabrication way. According to use length splinting is classified into short term splints, provisional splint and long term splints.
- Based on material splinting is of 3 types: metallic, non-metallic and combination of non-metallic and metallic type. The metallic is made up of chrome, cobalt, cast metals, stainless steel. Non metallic are made of composites and acrylic.

- According to the way of fabrication it is of 2 types: fixed and removable type.
- Based on the location of splinted teeth in the jaw, it is of 2 types: Extra coronal and Intra coronal. Extra coronal splints are stabilizing wire, fiber-reinforced ribbon, fixed orthodontic retainer, right guard and welded bands. Examples of Intra Coronal splints are inlays and nylons wire which make the splint place visible and superior esthetic.
- Based on the duration and purpose:
- **Temporary splinting:** Temporary splinting is used in periodontal treatments for less than 6 months. to reduce unfavorable occlusal forces, anchorage in orthodontic treatment and advanced periodontal disease as a support temporary splinting is used. It can be removable, fixed external and fixed internal. Removable temporary splints are acrylic Hawley, bite guard or night guard. Splint made with acid etchy, self polymerizing resin and composite materials are most popular.
- **Provisional Splints:** For more stabilization like permanent type, diagnostic purposes it is used for several months to a year. It is the phase of restorative therapy for immediate and temporary basis of treatment of teeth with dressing coverage and stabilization. Examples of provisional splinting are ligature wires, night guards, Interim fixed prosthodontic appliances and composite resin splints.¹⁵

For application of provisional splint, by using 35% Phosphoric acid enamel surface is etched for 10 seconds. Then the surface is wiped with wet cotton or rinsed using water. Then denting bonding agent is applied and polymerized by light. By using a suitable shade of composite the splinting material is placed and polymerized for 40 seconds. The splinting material is ligature wire and glass fiber.

Definitive splint: After the occlusal stability and the periodontal therapy completed, definitive splints are used. By definitive splint occlusal trauma is prevented, Functional stability increases and esthetic is improved.¹⁶

Conclusion

Tooth mobility is the common cause due to trauma from occlusion and periodontal problems. By eliminating trauma from occlusion cause mobility, bone loss and attachment loss can be reduced. Tooth with

poor prognosis rate can be retained in the arch for long term until definitive treatment is planned by splinting. For periodontal maintenance and periodontal therapy splinting has a major role. Splint never eliminates the cause of teeth mobility. It is just a supportive method in the periodontal treatment procedure. To increase the prognosis rate of mobile teeth due to periodontal or other problems. Splinting is considered as an important part of dental treatment based on present data.

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