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Research Article

ORTHO-PERIO INTERRELATIONSHIP¹Turki Mohamed A Alsubaie, ²Ahmad Abdulaziz Almulhim¹Imam Abdulrahman Bin Faisal University**Abstract:****Introduction:**

The term synergy refers to a two or more distinct influences acting together to create an effect greater than predicted. The term applies to the relationship between orthodontic and periodontics specialties in treating the patient. The interrelation focus on identification of the periodontal problem that could become more complicated during orthodontic treatment and conversely, those can benefit orthodontic therapy. Orthodontic tooth movement improves periodontal health in many cases and vice versa.

Aim of work:

In this study, we aimed to understand the interaction between orthodontic and periodontics specialties in dentistry, the periodontal tissue response on orthodontic therapy. A multidisciplinary approach required for the correction of complex dentoalveolar problems which can be better explained with ortho-perio integration.

Methodology:

The review is using the comprehensive search of PUBMED from the year 1880 to 2016.

Conclusion:

Every dental treatment requires good periodontal health especially orthodontic treatment. The orthodontic procedure is the double-action procedure regarding the periodontal tissue, it provides healthy state of the periodontal ligament, but on the other hand, it produces negative effects on periodontium including the gingival recession, gingivitis and bone defects. In recent years, due to the increased number of patients seeking orthodontic treatment, the orthodontist faces numerous periodontal problem hence an interdisciplinary approach could be effective in providing effective treatment. The development of new methods to accelerate tooth movement via periodontal procedures has shortened the treatment time, therefore, increased patient compliance. Thus the harmonious correlation among the two specialties provides the best treatment for combined orthodontic-periodontal problems.

Keywords: Orthodontic treatment as an adjunct to periodontal therapy and vice-versa, interdisciplinary approach, new methods of tooth movement.

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INTRODUCTION: ORTHODONTIC TREATMENT AS AN ADJUNCT TO PERIODONTAL THERAPY :

Uprighting, rotation, intrusion and several other orthodontic procedures treat teeth that have migrated pathologically in the oral cavity. They also prevent further periodontal breakdown, improve oral function, and provide acceptable aesthetics. These procedures should be performed once the periodontal condition is in control. There is no direct, consistent relation between malocclusion and periodontal disease, but certain characteristics of malocclusion can hinder periodontal therapy, but following adjunct can be used in periodontal therapy: [1]

1. Orthodontic Uprighting causes the distal movement of tooth allows deposition of bone at the mesial defect eliminates gingival folding and plaque retentive area. [2]
2. Correction of crowded or malposed teeth permits the patient to access all surfaces of a tooth thus improve oral hygiene and reduce food impaction. [3]
3. Extrusion of teeth orthodontically are used for its crown lengthening but also may be used for lessening bony periodontal defects. The connective tissue attachments move coronally along with the tooth which also results in bone deposition in defects. [4]
4. Orthodontic intrusion maybe indicated in horizontal bone defect or infrabony defect as well as single tooth crown lengthening. However, the intrusion of plaque-infected teeth apically displaces the supragingival plaque thus periodically scaling is essential during the intrusion. [5]
5. Uprighting, extrusion and leveling defects of bone can correct hemiseptal defects. [6]
6. The intrabony defect can be improved by bodily movement of the tooth since it has been believed to "carry the bone," along with the tooth, that results in improvement of the defect along with the improvement of adjacent tooth position before placement of implant or tooth replacement. [3]
7. Orthodontically assisted occlusal improvement may be required in the treatment of patients with severely attrited lower anterior teeth with periodontal procedures.
8. Orthodontic treatment can improve esthetic maxillary gingival margin levels. Aligning the gingival margins orthodontically removes the need of gingival contouring. [7]

ADVERSE EFFECTS OF ORTHODONTIC TREATMENT ON PERIODONTAL TISSUE:

Several types of gingivitis, periodontitis, gingival recession and the formation of gingival pockets had been noted during and post orthodontic treatment. Various species of bacteria such as *Bacteroids intermedius*, *T. deticola*, *P. nigrescens*, *C. rectus* and *fusiform* were considered to increase in plaque of patients undergoing orthodontic treatment. [8]

PERIODONTAL TREATMENT AS AN ADJUNCT TO ORTHODONTIC THERAPY:

Adjunctive periodontal procedures along with orthodontics are required on many occasion for, a stable and esthetically acceptable outcome.

1. Circumferential supracrestal fiberotomy on an orthodontically corrected rotated tooth prevents its relapse ^[11]
2. Frenectomy of a high frenal attachment assists in midline diastema closure. [10]
3. Forced eruption of a labially or palatally impacted tooth is common orthodontic procedure in recent times which requires a careful exposure of the impacted tooth with preserving keratinized tissue which in turn is important to prevent loss of attachment. [7,9]
4. Teeth with short clinical crowns require crown lengthening for proper placement of orthodontic appliances. It is usually performed by gingivectomy or an apically repositioned flap before orthodontic bonding procedures. [12]
5. Mucogingival surgery may be advised to maintain the adequate width of gingiva in orthodontic proclination of the incisors where they carry a greater risk of recession and loss of attachment, especially in areas with minimal gingiva and bone support. [13]
6. Implants for orthodontic procedures may require alveolar ridge augmentation before as an adjunctive procedure. [14].
7. The causative factor for missing interdental papilla, frequently referred to as gingival "black holes" can be due to over-divergence of adjacent roots and advanced periodontal disease with loss interdental alveolar crest. Hence, the orthodontic periodontic interdisciplinary approach is usually advised to manage these problems. [15].
8. When gingival margins fail to migrate apically on time, a gummy smile is produced. This can be corrected with aesthetic gingival surgery. Another cause of gummy smile is vertical maxillary excess. [21]

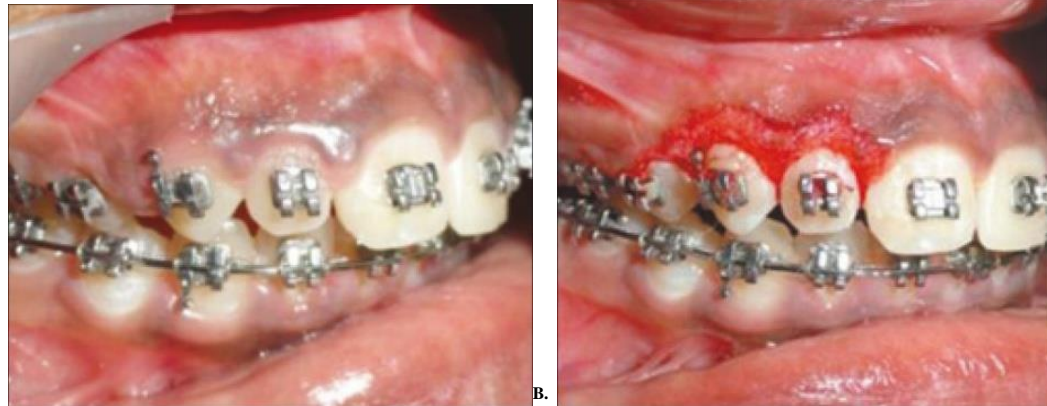


Figure 1: (A) Delayed apical migration of gingival margins (B) Gingivectomy procedure done [21]

PERIODONTICALLY ASSISTED TOOTH MOVEMENT:

Corticotomy- Assisted Orthodontics has been employed in various forms to accelerate tooth movement and was first introduced by Henry Krole in 1959. The continuity cortical bone is broken down by selectively cutting bone at the same time preserving the vitality of the teeth and marginal periodontium which leads to rapid teeth movement. [16] The corticotomy-assisted orthodontics is based on the regional acceleratory phenomenon (RAP) in which the tissue regenerates at a much faster rate in response to local noxious stimuli. The increased osteoblastic-osteoclastic activity and increased level of inflammatory mediators, which accelerate the bone turnover and facilitate rapid orthodontic tooth movement. [17]

Advantages:

- Reduces the treatment time
- Facilitates expansion of the dental arch
- Root resorption is less compared to normal tooth movement due to reduced resistance from cortical bone. [18]
- Provides improved prosthodontic stability and reduces relapse tendencies. [18]

Periodontally Accelerated Osteogenic Orthodontics (PAOO)

Periodontally accelerated osteogenic orthodontics (PAOO), was introduced by Wilcko et al. (2001) also called as Wilckodontics. It is a revised corticotomy-Assisted orthodontics technique,

which involves elevation of a full-thickness labial and lingual flap followed by scoring of labial and lingual cortical plates surgically (corticotomy) and finally injecting some graft material, closure, and orthodontic force application. [18]

After one week of surgical procedure, placement of the orthodontic appliance and its activation is done. The initial orthodontic force is applied within two weeks after surgery. The period for this regional acceleratory phenomenon typically continues for 4-6 months. Full advantage of this phenomenon requires no delay in the activation of the orthodontic appliance. [18]

PIEZOCISION-ASSISTED ORTHODONTICS:

It is a new minimally invasive surgical procedure introduced by Dibart et al. in 2009.

A microincision on buccal gingival is performed that allows the piezoelectric knife to give osseous cuts to buccal cortical plates and initiate RAP. [19]

Advantages:

- Allows bone and soft tissue grafting along with tunnel approach. [19]
- Osteonecrosis is prevented since piezosurgery works only on mineralized tissue, sparing the soft tissues.
- Less traumatic compared to classic decortications procedure. [20]

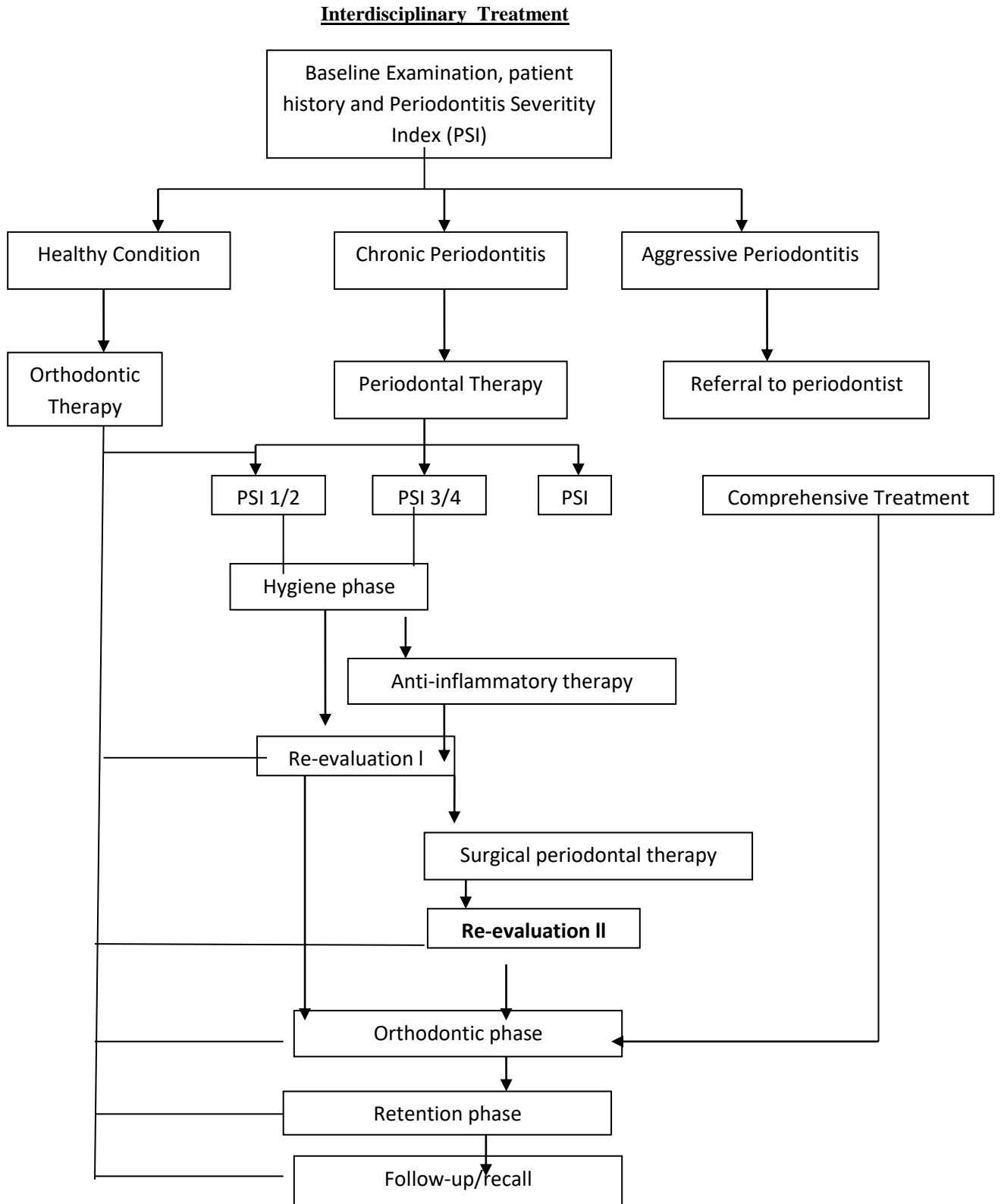


Fig 2: Summary of Interdisciplinary Treatment [22]

CONCLUSION:

Periodontal surgical procedures that accelerate orthodontic tooth, especially PAOO and piezosurgery has improved quality of treatment and also shortened the time. Cooperation between an orthodontist and a periodontist offers great possibilities for the treatment of combined orthodontic-periodontal problems.

Patient's education and motivation as complemented by interdisciplinary approach transform the patient's unattractive dentition (due to migrated teeth secondary to periodontal breakdown and inflamed periodontium) into an attractive dentition with a radiant smile. Due to close relations of orthodontic and periodontal health, An in-depth knowledge of ortho-perio relationship is of profound importance and helps in executing the best possible outcomes in needy patients.

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