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Review Article

Premolars; Friend or Enemy: A Review from Orthodontist Prospective

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***ABSTRACT*:**
During the orthodontic treatment planning, tooth crowding as well as the protrusions require rigorous attention which includes extraction of the first and second premolars. Some important elements of orthodontic diagnosis- maxillomandibular relations, dentoalveolar bone discrepancies, skeletal maturation, dental asymmetries, facial profile and also the patient cooperation. The present review summarizes the perspectives of authors, reasons for the decline in extractions as well as the present understanding of debate.
Keywords: Controversy, Extraction, Non- extraction, Orthodontics, Premolar

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INTRODUCTION:

Orthodontics, is rich both in its history as well as the controversies. Unlike disputes, the controversies never end and thereby cannot be resolved completely by validating any one side of the argument through the scientific evidence. Out of all the controversies, one such is extraction vs non-extraction of premolars. [1]There has been significant decline in extraction for orthodontic treatment in the last two decades. This is augmented with the high pressure from the referring dentist to treat the patient without extraction treatment modality, by being unaware of the literature which supports the extractions in specific cases.[2] The orthodontists have been arguing about the extraction vs non-extraction therapies of premolars in the orthodontic treatment plans since the Angle-Case debate of the early 20th century. As per the common man's perspective, the crowding causes malocclusion more frequently than spacing. The treatment of a crowded arch requires the space gaining and this has been achieved by treating in the two ways i.e., the premolar extraction or premolar non-extraction modality. The extraction is to create the space for accommodation of remaining teeth of crowded dental arches. However, the debate still continues, there are several very real reasons why still today's orthodontists recommend the extraction of the premolar teeth.[3] This debate that has continued for more than 100 years and probably will continue in the future. However, there are some very real reasons that today's orthodontists still recommend the extraction of teeth. Now a days, most of the orthodontists firstly carry out non-extraction of premolar treatment plans

for the patients, and then extract only when they confronted with some clinical problems.

REASONS FOR DEBATE:

Facial Profile-

The major concern in choosing between extraction and non-extraction of the premolar's treatment modality is the effect it has on the soft tissue profile of the patient. [4]In 2013, a three dimensional soft-tissue analyses by Solem et al following the treatment by the extraction revealed that the distinct changes were observed in the patients who had protrusion, and the retraction of the lip.[5] Thereby, in few patients with fuller profile, extraction does not necessarily cause the "dish-in" of face and results in better esthetics than the non-extraction treatment in those patients. Therefore, the clinicians have to plan the cases appropriately in order to avoid the over-retraction of anterior segment leading to unfavourable changes in the profile.

Extraction & TMD-

The most orthodontists did not believe that premolar extractions could lead to TMD, yet their fear was heightened if they advocated extraction treatment modality. In early 1990s, the orthodontic scientific community put forward the high-quality evidence which states that there is no direct relationship between the orthodontic treatment and TMD. There are some literatures which also discuss and also support the contention that any type of orthodontic treatment has a neutral effect.[5, 6]

Buccal Corridors-

Few orthodontists believe that extracting maxillary premolars leads to the narrowing of dental arch, which results in the broader buccal corridors which is not aesthetic.

REASONS FOR DECLINE IN EXTRACTIONS:

Bonding-

The bonding of the fixed appliances that replaced the banding to quite an extent, also permitted the non-extraction treatment plan in many patients.[6]

Airotor Stripping (ARS)-

ARS or interproximal enameloplasty was promoted by Dr. Jack Sheridan. According to his belief, if there is reduction in the interproximal enamel, without resulting in increased caries risk or periodontal problems, orthodontists could also do the same, if they exploit the advantages of full arch bonding, which opens the interproximal areas and allows for reshaping. Around 6-8mm of the space can be gained to resolve protrusion, crowding or a combination of both. [7, 8]

Expansion-

The expansion has been promoted since long in order to treat the posterior crossbite. It became popular in 1980s, as a substitute to premolar extraction treatment in order to resolve the crowding even without the presence of posterior crossbite. Rapid maxillary expansion (RME) also claims in resolving the borderline crowding of about 3-6mm in the mandible in patients with narrow transpalatal widths.[8] Moreover, the prospective complications of the expansion include the risks of causing a dehiscence i.e., the loss of alveolar bone on facial aspect of a tooth that leaves a characteristic oval, root-exposed defect from the cementoenamel junction apically, which happens as a result of overexpansion. The anterior teeth tend to move labially when treated by the expansion of arches in order to alleviate moderate to severe crowding. The extractions of the premolar on the other hand allow the teeth to move along the alveolus.[9]

Self-ligating brackets-

The effectivity as well as the efficacy of the self-ligating brackets is better than the conventional brackets. This reduces the treatment time and, in most cases, also avoids the need for the extractions.

Leeway space-

In this era, the patients are more actively involved in decision of their treatment planning than at any time in the past time. Thereby, the fear of pain and loss of the teeth overpowers the patient's thinking. However, unfortunately, this may result in offering a more conservative premolar non-extraction option, even if it is not in the best interest of the patient.[9]

CONCLUSIONS:

It is a difficult and complex task to identify the guidelines for the premolar extraction vs non-extraction decision in the planning of orthodontic treatment. Presently, the controversy regarding the premolar extraction vs premolar non-extraction is not afflicted by as much beliefs as it was almost 100 years ago and both of the treatment options are still open. The option to treat with premolar extraction or non-extraction should be made objectively on the individual case on the basis of strong evidences with equal attention on the soft tissue paradigm.

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