ORIGINAL RESEARCH PAPER

Volume-8 | Issue-5 | May-2019 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

ADULT ORTHODONTICS : A REVIEW ON SPECIAL CONSIDERATIONS IN TREATMENT

Dental Science

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ABSTRACT

The demand for seeking orthodontic treatment by adult patients is increasing. The most important reasons were the change in the concept of normality, allowing the selection of simpler and more conservative and consistent therapeutic objectives. The conceptual technological advancement makes the orthodontic management more effective, fast and comfortable. The need for Adult Orthodontic treatment is absolutely established by creating awareness in society regarding advantages of this treatment, increase in esthetic demands, and an increase in social, and professional life.

KEYWORDS

Adult Orthodontics, Root Resorption.

INTRODUCTION

In last few years there has been a considerable interest in orthodontic treatment for the adult patient. According to Ackerman, adult orthodontics is defined as 'The branch of orthodontics concerned with striking a balance between achieving optimal proximal and occlusal contact of the teeth, acceptable dentofacial esthetics, normal function and reasonable stability"[1].

The study conducted in the USA has reported that up to 25% of orthodontic patients are adults. A survey conductd by Salonen[2] et al in Swedish has showed that the prevalence of malocclusion, in the 920 surveyed adults aged more than 20 years, ranged from 17−53%. However, only 5% requested orthodontic treatment. Similar findings were reported in another study conducted in Holland[3]. In the UK, the major orthodontic traits in adults seeking treatment were mal-alignment of the lower/upper arch and Class III malocclusion while 90% of adult orthodontic treatments were provided using fixed appliances[4].

The number of adults seeking orthodontic treatment has increased considerably in the last 20 years. They fall under two different groups: younger adults (under 35, often in their 20's) who desired, but could not receive comprehensive orthodontic treatment during adolescent period[5]. An older group, typically in their 40's or 50's who have other dental problems are being recognized as candidates for adjunctive orthodontic treatment to make control of dental disease and restoration of missing teeth easier and more effective. The major finding in adult patient is that they are more concerned about improving their appearance and social acceptance than function. It has been proved that orthodontic treatment, besides improving dental esthetics, also has a significant impact on the psychosocial aspect of the patient's life[6].

INDICATIONS

- Indications for orthodontic treatment in adults include:
- Addressing aesthetic and functional concerns.
- Re-treating previously failed orthodontic treatment.
- Adjunctive to periodontal, restorative or prosthetic rehabilitation.
- Combined orthodontic or surgical treatment.
- Treatment of snoring and obstructive sleep apnoea.
- Improvement of occlusion and co-ordination with the masticatory muscles and TMJ.

CONTRAINDICATIONS

- Contraindications for orthodontic treatment in adults include:
- Severe skeletal discrepancies .
- Advanced local or systemic disease.
- Excessive alveolar bone loss.
- Poor prognosis in stability of treatment.
- Lack of patient motivation.

SPECIAL CONSIDERATIONS IN TREATMENT

Reduced scope for growth modification:

Orthodontic treatment reponses differ in adults and adolescents due to lack of growth and different metabolic activity. Ruf and Pancherz[7] carried out a non-surgical attempt to address a Class II skeletal discrepancy and found no dento-alveolar differences in the use of a Herbst appliance in the treatment of moderate skeletal II malocclusions between adults and teenagers. However, when the patient has concerns about facial aesthetics, and where there is a moderate to severe skeletal discrepancy then it has to be accepted or treated surgically.

Social considerations:

The expectations of adult patients are more concerned about social acceptance and esthetic appliances. Clear aligners, esthetic brackets and lingual appliances are usually the choice of adult patients who have hesitation in accepting visibility of fixed appliances mainly for social reasons. To achieve realistic treatment objectives the limitations of orthodontic treatment must be explained at the beginning of treatment[8,9].

Age changes in bone:

As age increases the cortical bone becomes dense and the spongy bone reduces. In adults, the apical shifting of the center of resistance of the involved tooth occurs due to marginal bone loss resulting in increased tipping moment produced by the applied force. Proper biomechanics has to be applied with adequate counter moment to achieve bodily movement of periodontally involved teeth.

Periodontal considerations:

Adults are more likely to be periodontally compromised. Aging reduces the vascularity of periodontal ligament which results in delayed response to orthodontic forces in adults. Lighter forces should be applied rather than heavier forces to reduce the risk of vascular compression and necrosis of the blood vessels of the periodontal ligament[10]. Due to uncontrolled forces there is high-risk of iatrogenic damage to the periodontium. During orthodontic treatment periodontal care should be undertaken to keep a check on periodontal conditions[11].

Restorative Considerations:

Orthodontic appliance placement gets complicated with the presence of restorations. Bonding of brackets to gold, amalgam, or porcelain can be done by sandblasting the surface of the restorations. Etching with 9.6% hydrofluoric acid or 1.23% acidulated phosphate fluoride gel, together with silane primers and highly filled composite resin can be used in addition to increase the bond strength to porcelain. Bonding can be made easier by temporarily restoring the teeth with composite or by simply using a band. Endodontically treated teeth have more

resistance to orthodontically induced iatrogenic root resorption and can normally be moved orthodontically[12].

Mandibular dysfunction:

As adults are more likely to suffer with temperomabdibular dysfunctions they should be carefully evaluated before contemplating any orthodontic treatment. Unless TMD is stabilized orthodontic treatment should not be initiated.

Treatment Mechanics:

The orthodontic forces used in the treatment of adult patients should be as low as possible with careful control of tooth movement. Due to an altered moment-to-force ratio, the loss of alveolar and periodontal support can result in tipping of teeth easily, and may reduce the anchorage value of affected teeth. It is recommended to use thermo-elastic Nickel Titanium archwires in order to apply a gentle force to the periodontally compromised teeth.

In adults the rate of space closure is slow as compared to growing patients. Surgical assisted space closure or an accelerated osteogenic orthodontics technique can be recommended for faster space closure. As an alternative to space closure, prosthetic replacement for larger spaces or restorative camouflage of a small space is preferable[13]

.

Molar extrusion should be avoided as a method of deep bite correction in adults. Overbite correction should rather be achieved by intrusion of incisors, as extrusion of posterior teeth would encroach in the freeway space, stressing the TMJ[14]. This is usually achieved by segmented arch mechanics. Due to the lack of vertical growth in adults, any deep bite correction achieved with molar extrusion is relatively unstable, and prone for relapse.

Relapse:

The goal of finishing the treatment should be to achieve a satisfactory periodontal and functional condition. The spontaneous migration of teeth can be prevented by splinting and permanent rretention[15]. The center of resistance of the teeth gets displaced apically due to marginal bone loss resulting in absence of equilibrium between the forces and the resistance. Adults require permanent retention in most cases as they exhibit higher relapse tendencies compared to adolescents[16].

RETENTION

Retention is a disparaging and challenging aspect of adult orthodontics. The need for post orthodontic stabilization will coincide with the need for both restoration of mutilated dentition and cross-arch stabilization.

CONCLUSION

Many adult possess dental malocclusion that can be corrected by orthodontic treatment. A directed and effective treatment approach is necessary to meet the expectations of these patients, which are usually related to the search for enhanced esthetics, reduced treatment time and minimum discomfort during utilization of orthodontic appliances. The present case report demonstrated a consistent mechanics, guided by enhanced objectives, which are essential and may be achieved rapidly, providing esthetic quality of smile and potential occlusal stability to the patient.

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