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Limitation of Adult Orthodontics

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Abstract

The number of adult patients seeking orthodontic treatment has increased over the past few years. While treating adult patients various factors like their psychosocial factors and systemic factors have to be considered in addition apart from the regular treatment planning. Also while treating the adult patients an interdisciplinary approach is often necessary. The treatment for adults differs from that of adolescent patients and has certain limitations to it. Hence the aim of this review article is to throw light on the various limitations of adult orthodontics.

Keywords: Adults, Orthodontic Treatment

Introduction

Adults seeking orthodontic treatments have been increased considerably over the years as society is gradually becoming more esthetic oriented. Adult orthodontics requires a different approach to the treatment than treatment for growing adolescent individuals due to varied reasons. Lack of growth potential makes growth modification procedures not applicable to adults and imposes limitations to certain tooth movements.

These adults have already completed growth of craniofacial complex and treatment modality of growth modification is not an option for them. Perio restorative problems, multiple extractions, other oral diseases, systemic problems, aging of the tissues, different psychosocial factors need to be considered while formulating appropriate individualized treatment plan. The complex interaction of these factors leads to a much different approach for adult orthodontics.

Many biological and psychosocial factors associated with adults need a change in biomechanics and treatment approach than that in growing adolescents.

While treating adult patients various factors like their psychosocial factors and systemic factors have to be considered in addition apart from the regular treatment planning. Also while treating the adult patients an interdisciplinary approach is often necessary. The treatment for adults differs from that of adolescent patients and has certain limitations to it. [1]

Changed lifestyles and patient awareness have increased the demands for adult orthodontic Treatment and multidisciplinary dental therapy has allowed better management of the more complicated and unique requirements of the adult patient population, thereby greatly Improving the quality of care and treatment prognosis. In addition to goal clarification, adult patients desire treatment efficiency, convenience in appointment timings and good communication with other health care professionals. Almost 80% of the adult patients require interdisciplinary treatment planning and treatment execution. With the adult, consultation with another specialist isn't occasional. It is the rare adult whom one treats orthodontic ally without finding it necessary to collaborate with another specialist. This represents both the challenge and the excitement of adult orthodontics. [2]

Reason for the Increase in Adult Orthodontic Treatment's Demands Recently

An increased inflow of adult patients has been witnessed in orthodontic practice during recent times. Changed lifestyles and improved dental and orthodontic awareness have increased the demands for adult orthodontic. The social acceptances of orthodontic treatment among adults have also been noticed as they more financially and mentally prepared for treatment. Nowadays the adults are more concerned regarding the general wellbeing of teeth causing increase in the demand for orthodontics to facilitate restorative and/or periodontal care. Dissatisfaction with previous orthodontic treatment can also be a reason. Recent advanced orthodontic appliance that is less visible and more practical in treating problem that were difficult to be treated before. [3]

Adult patients more careful, punctual, prompt payers and treatment time is generally more than that of younger patients. [4]

Goals of Adult Orthodontic Treatment

Adult orthodontics is concerned with striking a balance between achieving optimal proximal and occlusal contact of the teeth, acceptable dent facial aesthetics, normal function, and reasonable stability. Improving axial inclination of teeth for adequate bone between roots for good vascular supply and good contact region.

The objectives of adult orthodontics correspond to the general objectives of orthodontics i.e.:

Optimum occlusal functions; improve the aesthetics of the face and teeth; contribute to the Longevity of the stoma to agnatic system. However, a fourth objective can add in adults: realize a treatment of "aid" to the prosthesis, achieving parallelism of abutment teeth (to limit tooth cutting and appropriately estimated substitution for creation of prosthesis). Up righting and extrusion of posterior teeth with occlusal equilibration once in a while followed by endodontic treatment (to improve vertical crown-root proportion) .Forced extrusion of those teeth which get damaged up to 33% of cervical line (to improve availability) [1.4]

Limiting Factors & Treatment Considerations

An adult patient requires a different treatment approach from adolescents due to following limiting factors

Psychosocial factors

The demand for correction of malocclusion is not just a somatic need rather a psychological and sociological demand. This neglected relationship between psychological factors and orthodontic need holds a great importance in treating adult patients.

Fundamental knowledge of psychology is necessary for modern orthodontics. The study of actions and reactions of individuals in social situations and the influence of such reactions on an individual is known as “dialectic psychology” [5]

Several authors have reported on the increase in the number of adults coming for orthodontic. This change over few years has been attributed to various factors including the improved appearance of fixed appliances, increased awareness of the possibilities of orthodontic treatment, and the social acceptability of fixed appliances.[6]

It is important to design social administration prior to clinical administration to get satisfy the high treatment desires of grown-up patients. They are more concern about the detail of the treatment as treatment time, multifaceted nature of treatment, number of visits, and probability of rectification and so on and are more uncomfortable with machines. [7]

Thus, grown-ups request best treatment brings about a short time. Thus, it is very essential to advise these patients about the restrictions and unpredictability of the treatment, expanded treatment time and high backslide potential. Grown-up patients may face difficulty in accepting the orthodontic apparatuses. They may request tasteful apparatus for example tasteful sections, lingual apparatus, envisaging and so forth regardless of their restrictions. [7]

Absence of growth

In adult patients as the growth phase has ceased, growth modifying appliances cannot be utilized. Hence the treatment modalities are limited to dent alveolar corrections, surgical corrections or camouflage treatment. Overbite correction if needed can be done by posterior teeth extrusion rather that anterior teeth intrusion due to lack of vertical development affecting the TMJ muscles and result in downward and backward movement of the mandible, which can lead to relapse due to instability. [7, 8]

Physiological age changes of varying degree

Adult bone is more affected by mechanical forces making it more prone to attachment loss and bone loss along with mild gingival infections as compared to children and adolescents. Risk of marginal bone loss is also mostly seen in adults due to periodontal damage.

Age associated changes can also be noticed in periodontal ligaments. Decreased number of fibroblasts with more irregular structure decreased organic matrix production and epithelial cell rests and increased amounts of elastic fibres have been reported in periodontal ligaments with increasing age. Gingival recession (migration of functional epithelium) is a physiological process, which occurs with simultaneous increase in the width of the attached gingival due to passive eruption of teeth to maintain occlusal contact with antagonist following loss of tooth surface.[9,10] From attrition. Light forces are used due to varied reasons. Firstly, initially it takes longer time (delayed response) due to reduced cellular activity in adults. Secondly, bone loss at alveolar crest due to aging or periodontal disease leads to apical shift of centre of resistance increasing the likelihood of tipping than bodily movement necessitating low force and large moment

ratio. Thirdly, dense cortical bone and decreased periodontal width may lead to root resumption. [10, 11]

Retraction force has a larger extrusive force component if the marginal bone loss is most pronounced; hence light continuous intrusive force should be maintained during retraction in such cases. The delayed response to mechanical stimulus is suggested to be caused by insufficient source of pre osteoblasts. Norton suggested that reduced vascularisation with increasing age might also explain supply of insufficient amount of pre osteoblasts (progenitor cells for bone formation). Rate of tooth movement in adults is similar to that in adolescents after delayed initial tissue reaction, when the tooth movement is much slower in adults than that in adolescents. Total treatment time remains to be almost same for both adults and adolescents if good cooperation is achieved from an adult patient, who makes up for initial slower tooth movement. Prolonged retention is required due to reduced cellular activity thereby increase in lag time to form bone in adult patients.[11]

Perio restorative problems

Before undertaking an adult patient for orthodontic treatment, a quantitative and qualitative inspection of the bone is mandatory. The amount of periodontal support available holds importance in respect of the anchorage consideration during orthodontic treatment. Any underlying active periodontal disease has to be diagnosed and treated before commencing the treatment. [12] In cases of severe periodontal damage periodontal procedures will be required and treatment should progress only after getting a written consent from the patient. In such cases bone supported anchorage maintenance can be considered. [13]

Generally adult patients have an increased number of restorations like amalgam restorations or porcelain and metallic crowns in their dentition. Hence while bonding special care may have to be taken. Excess adhesives on the surface of attachments have to be removed as the rough surfaces attract more plaque accumulation. All restorations must be properly polished to reduce the tendency of plaque retention. [13]

Choice of extraction for orthodontic treatment may be affected by perio restorative problems or already extracted tooth. Adults have many pre-existing conditions which makes the adult orthodontics different from adolescent orthodontics. [14]

Although there is no clear correlation between malocclusion and periodontal disease or between the effects of orthodontic treatments on periodontal improvement the literature Describes clear interaction between Orthodontics and Periodontics.[15]

Probable contributions of orthodontics in the periodontics field are:

1. It allows better oral hygiene by the patient, well-shaped dental arches and aligned teeth allows better oral hygiene maintenance. Absence of dental crowding, malocclusion as a periodontal aetiology can be eliminated.
2. The vertical occlusal impact parallels to the long axes of the teeth. Hence, the applied muscle force is uniformly distributed all over the dental arch.
3. Along with prosthetic rehabilitations, it maintains a normal vertical dimension;
4. In specific cases, the adequate dental crown-root relationship is achieved through orthodontic extrusion, without any bone loss; hence via up righting of teeth the vertical defects of bone can be corrected.
5. It improves the positioning of abutment teeth for fixed prostheses and the adjacent teeth of osteo integrated implants;
6. It eliminates effects of bruxism, as pain or muscle spasms.
7. The current available orthodontic technology along with proper diagnosis and planning
8. light and efficient orthodontic movements are possible.[13]

TMD

Adult patient may seek the orthodontic treatment due to TMD and there is a higher risk of developing TMD in adult patients without TMD not related to orthodontic treatment. Hence, adult patient needs a thorough check up for the signs of TMD and he needs to be explained about the risk of developing TMD not necessarily related to orthodontic treatment and also limitations of orthodontic treatment in the management of TMD. [17, 18]

Signs of Root Restoration or Vulnerability to Root Restoration

Adult patient must be informed about the risk of root restoration and thoroughly evaluated for the susceptibility to root restoration. All measures should be taken to manage root resorption. Before starting orthodontic treatment, the patient must be carefully evaluated for systemic diseases, perio restorative problems, TMD and vulnerability to root resorption apart from routine diagnostic procedure. All the systemic and dental diseases should be appropriately managed with interdisciplinary approach at the start of orthodontic treatment.

Adult orthodontics often requires interdisciplinary approach to deliver efficient treatment outcome. [19, 20]

Conclusion

In recent times, more focused attention is paid to better understand the limitations of adult orthodontics. An individualized appropriate treatment plan needs to be formulated for an adult patient on the basis of careful evaluation of a complex interaction of various biological, psychosocial and mechanical factors

References

1. Fastlicht J. Adult orthodontics, Journal of clinical orthodontics 1982; 16:606-618.
2. Thomas M Graber, Rober t L Vanarsdall, Katherine W L Vig. Or thodontic: Current principles and technique, 4 th edition: 937-985.
3. Limitations of adult orthodontics- a review k.c. subhiksha , dr. saravanan , dr. kanan sabapthy . type of the article – review
4. Robert C. Chiappone. Special considerations for Adult Orthodontics. J clin orthod1976; 10:535- 545.
5. Pabari S, Mole DR. Cunninghamc SJ. Assessment of motivation and psychological characteristics of adult orthodontic patients. Am J Orthod Dentofacial Orthop. 2011; 140(6):e263-72.
6. ZachrissonBU.Global trends and paradigm shifts in clinical orthodontics. World J Orthod 2005; 6(Suppl):3-7.
7. Bishara SE. Textbook of orthodontics. WB Saunders Co, 2001
8. Houston WJB. Mandibular growth rotations- their mechanisms and importance. Eur J Orthod 1988; 10:369-373.
9. Bond JA. The child versus the adult. Dent Clin North Am 1972; 16:401-412.
10. Reitan K. Tissue reaction as related to the age factor. Dental Record 1954; 74:271-279.
11. Dyer GS, Harris EF, Vaden JL. Age effects on orthodontic treatment: adolescents contrasted with adults. Is J Orthod Dentofac Orthop 1991; 100:523-30?
12. Ong MA, Wang HL, Smith FN. Interrelationships between periodontics and adult orthodontics. J Clin Periodontal 1998;25:271-277
13. Zachrisson BU, Buyukyilmaz T. Recent advances in bonding to gold, amalgam and porcelain. J Clin Orthod 1993; 27:661-75.
14. Forsberg CM, Brattstrom V, Malmberg E, Nord CE. Ligature wires and elastomeric rings: two methods of ligation and their association with microbial colonization of Streptococcus mutans and Lactobacilli. Eur J Orthod 1991;13:416-420
15. Del Santo M. Periodontium and Orthodontic Implications: Clinical Applications. Int J Stomatol Res 2012, 1(3): 17-23.
16. Specificities of Adult Orthodontics Mourad Sebbar, Nassiba Fatene, Asmaa El Mabrak, Narjisse Laslami, Zouhair Abidine and Zakaria Bentahar
17. Proffit WR, Fields HW, Sarver DM. Contemporary Orthodontics. 4th Ed, St Louis, Mosby, 2007.
18. McNamara JA, Seligman DA, Okeson JP. Occlusion, orthodontic treatment and temporomandibular disorders: a review. J Orofacial Pain 1995; 9:73-90.
19. Mirabella AD, Artun J. Risk factors for apical root resorption of maxillary anterior teeth in adult orthodontic patients. Is J Orthod Dentofac Orthop 1995; 108:48-55?
20. Malmgren O, Levander E. Minimizing orthodontically induced root resorption. In Graber TM, Eliades T, Athanasiou AE (eds). Risk management in orthodontics: Experts' guide to malpractice. Quintessence Publishing Co, 2004.

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