An overview of the characteristics between adult and adolescent orthodontics

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ABSTRACT

The upper age limit has been eliminated because the field of orthodontics has expanded to cover not only children and adolescents but also adults. Many young adults are seeking orthodontic treatment largely for aesthetic reasons due to the society's developing aesthetic consciousness. In order to get the most aesthetically beautiful face possible, they undertake extensive orthodontic treatment that involves significant occlusal alterations. In order to achieve a long-term prognosis, older persons with poor dental health who require perio-restorative treatment receive supplementary orthodontic treatment. Due to many concerns that are very different from conventional orthodontic treatment geared at children and adolescents, the orthodontist encounters difficulties when practising adult orthodontics. This article describes the challenges and constraints the orthodontist faces when practising adult orthodontics, along with solutions to overcome them.

Keywords: Adult, Orthodontics,

INTRODUCTION

In recent years, there has been an increase in the number of adult patients seeking orthodontic care. According to reports, 20–25% of orthodontic patients are adults, and this tendency is expected to rapidly increase in the coming years as society becomes more aesthetic and health aware. Therefore, it is crucial to investigate and comprehend the many orthodontic treatment features where adults, as opposed to teenagers, require particular attention. In terms of the stages of treatment and end objective, adult orthodontics is essentially the same as teenage orthodontics due to tissue changes related to tooth mobility. However, due to some differences in psychosocial, biological, and mechanical characteristics, adults require particular consideration when it comes to behavioural and clinical management (1). Adult patients need a different kind of treatment than teens do.

ISSUES TO BE CONSIDERED

Numerous aspects must be taken into account, and adults must receive special treatment.

- Psychosocial factors
- Perio-restorative problems
- Age related considerations
    - Lack of growth potential
    - Aging of tissues
    - Vulnerability to Root resorption
    - Vulnerability to TMD

Adult orthodontics frequently involves an interdisciplinary approach to produce effective treatment results, involving multiple healthcare experts, including periodontists, restorative dentists, prosthodontists, endodontists, TMJ specialists, oral and maxillofacial surgeons, etc (2).

Psychosocial factors

Understanding adult patients' expectations and attitudes is crucial for planning behavioural management prior to clinical management. Adult patients have high expectations for their care. They are more interested in the specifics of the therapy, such as how long it will take, how difficult it will be, how many visits there will be, etc. Appliances have been demonstrated to cause them extra discomfort. They are more obedient in adhering to the recommendations of the orthodontists, such as wearing elastic, maintaining hygiene, completing their appointments, etc., but they refuse to commit to long-term treatment (3). In other words, people demand the best therapeutic outcomes quickly. As a result, it's crucial to inform these patients about the treatment's drawbacks, complexity, prolonged duration, and high risk of relapse.

Adult patients could be reluctant to adopt orthodontic appliances that are visible. Regardless of their constraints, they may request aesthetic devices such aesthetic brackets, lingual appliances, invisalign, etc (3).

GOAL OF ORTHODONTIC TREATMENT

Even though achieving an acceptable aesthetic is a key treatment aim at any age, adults place a higher priority on the function, stability, and health of their dentition. Adolescent patients typically do not have as many prior conditions as adult patients do. As a result, new treatment goals are defined at the beginning of the process (1, 4). In order to facilitate and enhance the efficiency of periorestorative treatment, additional treatment goals are established by:

- Increasing the axial tilt of teeth (to provide enough bone between roots for a healthy blood supply and adequate contact surface);
- Achieving parallelism of the abutment teeth (to reduce tooth cutting, axial loading, and improper replacement size during prosthesis manufacture);
- Optimum placement of abutment teeth (to receive a prosthesis for improved stability);
- Occlusal equilibration and extrusion of posterior teeth, occasionally with endodontic therapy afterwards (to improve vertical osseous flaws, axial loading, and the crown-root ratio);
- forced extrusion of teeth that sustain damage up to one-third of the cervical line (to expand biological width, improve accessibility, and give greater support at the prosthesis's margin);

- instead of attempting to achieve Andrew's six keys to normal occlusion, reestablish functional occlusion while taking into account the skeletal relationship already present;

TREATMENT MODALITIES AVAILABLE

Either surgery or dental camouflage (removing a tooth to make room for the remaining teeth and hide the incorrect jaw connection) are used to correct skeletal anomalies. Adults do not choose growth-promoting devices because their growth is complete, unlike teenagers (5).

CONSIDERATIONS REGARDING EXTRACTION

The decision to extract a tooth can be complicated by the treatment plan's complexity or the dentition's periorestorative state. Closing the space may be challenging, particularly in the molar area. Mechanical and biological obstacles are posed by old extraction sites, which are frequent in adults. Closed spaces require unpredictable maintenance (they are challenging to close and maintain) (6). The cortical bone responds to orthodontic force very slowly. Instead of attempting space closure, it could need to be uprighted to open the mesial space for prosthesis.

Since normal bone growth might not take place if a tooth is relocated into the defect, it is preferable to shift teeth away from the extraction site generated by a tooth loss caused by periodontal disease in order to reconstruct it with a prosthesis (7).

CONSIDERATIONS REGARDING APPLIANCE PLACEMENT

Due to the existence of restorations like porcelain and metallic surfaces, specific precautions during bonding may be necessary (8). All restorations must be carefully polished, and extra adhesive should be cleaned off the area around any orthodontic attachments. To clean a variety of challenging regions, strict oral hygiene routines must be emphasised. Elastomeric modules may not be chosen over stainless steel ligatures since they are less likely to retain plaque and cause less friction (9).

BIOMECHANICAL CONSIDERATIONS

Adult bone responds to mechanical forces less quickly (10). With minor gingival infections, adults are more likely to experience loss of attachment and slight bone loss than adolescents (11). Adults frequently have gingival recession and marginal bone loss (12). Affected occlusal function may cause the supporting bone to exhibit disuse dystrophy (13). Loss of attachment causes the centre of resistance to move farther from the site of application of the force, increasing the distance between the two, which in turn causes the force's tipping moment to increase. In order to translate a periodontally damaged tooth, a greater countervailing moment is therefore necessary (7, 14).

The number of teeth to be moved, the anchoring that is available, and the direction and magnitude of movement are all taken into account while balancing the forces between the active and reactive components.

Due to less periodontal tissue, the same force exerts greater pressure on a tooth with damaged periodontology than it does on a healthy tooth. Due to other factors including delayed reaction (caused by adults' reduced cellular activity) and danger of root resorption (caused by dense cortical bone and limited periodontal width), the absolute magnitude of force should also be reduced (14-17).

CONSIDERATIONS REGARDING VULNERABILITY TO ROOT RESORPTION

Adult patients must be fully examined for root resorption susceptibility and warned of the danger of root resorption (1, 5, 10, 17, 20). Every action should take action to control root resorption.

At the beginning of the treatment, patients should be checked for any signs of root resorption (family history, habits, prolonged treatment time, long and narrow root morphologies, h/o damage, etc.). If there is no indication of root resorption at the beginning of orthodontic treatment, it is further assessed using IOPA radiographs 6 to 9 months into the course of care.

Root resorption needs to be monitored with radiographs every three months after the initial discovery of any indication.

CONSIDERATIONS REGARDING VULNERABILITY TO TMD

Adults are more likely than teenagers to develop TMD, which may not be connected to orthodontic therapy. Therefore, before beginning orthodontic treatment, adult patients require a complete examination for the symptoms of TMD. Due of TMD, adult patients may seek orthodontic therapy. The risks of TMD that are not always related to orthodontic treatment and the restrictions of orthodontic treatment in the treatment of TMD must be discussed to them (7, 21).

CONSIDERATIONS REGARDING TREATMENT TIME

The lengthier the treatment period, the slower the tooth movement caused by the delayed tissue remodelling linked with tooth movement (22, 23). Activation in adults typically needs to be done after a longer length of time, i.e. 3-6 weeks, as opposed to the 2-4 weeks needed in teenagers. When contrast to teens, tooth movement takes longer to begin. It is hypothesised that the diminished vascularization associated with ageing is to blame for the preosteoblast supply shortage that results in the delayed response to mechanical stimuli (24). After a delayed first tissue reaction, the pace of tooth movement in adults and adolescents is not all that different. If an adult patient cooperates well, making up for the initial delayed tooth movement, the total treatment duration can be made at par or somewhat longer in dults (25).

CONCLUSION

For an adult patient, a specific treatment plan must be created based on a comprehensive assessment of the intricate interactions of many biological, psychological, and mechanical components.

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