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Adult Orthodontics- A Literature Review

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Abstract:
The number of adults seeking orthodontic treatment has considerably increased over the past few years owing to various factors like increased access to an orthodontist, availablity of aesthetic treatment options making the appliance inconspicuous or increased awareness. Since adults have very high expectations, the limitations of the treatment must be highlighted. This review article focuses on the various factors which affect the adult orthodontic treatment, their scope and the various limitations.
Key words*: Adult orthodontics*

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I. Introduction

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 aesthetics, normal function and reasonable stability"[1].

The last 20 years have seen a boom in the number of adults seeking and undergoing orthodontic treatment. One category of adults patients can be described as younger adults under 35 years who always had a malocclusion but could not undergo treatment due to financial trouble, lack of awareness or access to an orthodontist[2]. This group requires a comprehensive treatment. The other one being older adults who in their 4th or 5th decade of life, require interdisciplinary treatment along with orthodontic management. These patients might have been referred by a dentist or have had a relapsed orthodontic treatment. While devising an individualized treatment plan, factors to be given due consideration include periorestorative problems, multiple extractions, systemic complications, temporomandibular disorders, increased chances of root resorption and tissue aging[3].

Majority of adult patients seek orthodontic treatment for improving their self-image rather than functional concerns[4].

The adult and adolescent patients

In cases with Class II or Class III malocclusions, growth modification is more successful in children as compared to adults, whereas adults, due to a lack of growth potential, have had to compromise with the treatment outcome many a times with camouflage treatment or may undergo more extensive orthognathic procedures.

Adult patients often suffer from alveolar bone loss or may have a missing tooth or teeth in which cases the adjoining teeth may have tipped into the space left by the missing tooth. Thus adequate treatments for controlling the periodontal disease and uprighting the tipped teeth must be carried out before the orthodontic procedure for a comprehensive treatment of the individual[5]. Similarly, bands should be avoided on molar teeth in adults and bonding tubes would provide better control of hygiene[6].

Similar to periodontal problems, adults may present with medical conditions, which need to be controlled before starting with the orthodontic treatment. The duration of treatment is not significantly increased in adult patient as against the common perception, except in the situations where the patient might be taking medicines for prostaglandin inhibition (indomethacin) or for treating osteoporosis (alendronate)[7].

FACTORS AFFECTING ADULT ORTHODONTIC TREATMENT

Psychosocial Factors

Adult patients generally are very demanding and have very high expectations from their orthodontist, but realistic goals should be set for the patient. The duration of treatment needs to be made clear to the patient too. Any psychological counselling, if needed should be provided to the patient before commencement of treatment[8].

Aging of the tissues:

These changes may be physiological or pathological. The physiological changes that appear with age include cortical bone becoming denser, decreased size of spongy bone and change in structure from honeycomb to a lace like network. Decreased bone volume and thinning of bony trabeculae is seen. In the periodontal ligament, decreased number of fibroblasts, increased amounts of elastic fibre with irregular structure, decreased organic matrix production and epithelial cell rests is seen.

The aging process in adults leading to decreased alveolar vascularity, altered bone metabolism and decreased collagen metabolism doesn't affect the orthodontic treatment process to a great extent[9]. Lighter forces are preferable as a delayed response to mechanical forces (because of insufficient preosteoblasts), alveolar crest bone loss causing apical shift and increased chances of root resorption are noticed. Prolonged retention is necessary owing to reduced cellular activity[10].

Growth Potential:

As discussed above, the growth potential of a person decreases with age and treatment options may be limited. Since growth modification is not effective in adults, extensive surgical procedures are performed on these patients to treat very severe malocclusions. If the patient has any apprehensions with regards to surgical procedures, they would have to settle for a less than ideal situation with camouflage treatment[11].

Periodontal problems:

Various periodontal parameters affecting the orthodontic mechanics and treatment planning are length and shape of roots, structure of gingiva and width and height of alveolar bone. Periodontal health needs to be regularly supervised and meticulous oral hygiene should be maintained, or else failure of orthodontic therapy may occur[12].

Temporomandibular (TMJ) disorders:

Adult patients may be more vulnerable to TMJ problems irrespective of orthodontic therapy. Therefore, the chances of patients developing TMJ problems are similar to that of a patient who has not been treated for any malocclusion[13]. A TMJ trouble may only be at times managed by orthodontic treatment. Molar extrusion should be avoided in adults, as it would encroach the freeway space and place undue stress on the TMJ. Deep overbite correction should be achieved with incisor intrusion instead.

Root resorption:

Adult patients need to be informed about the increased possibility of root resorption. Evaluation for root resorption should be done prior to treatment and regular follow-ups should be done every six to nine months using IOPA xrays[14].

Perio-restorative problems:

An old extraction site may have mesially tipped teeth into the space, which require uprighting so as to receive prosthesis. While bonding the attachment, excess adhesive should be removed in order to avoid any plaque retention due to the roughness of the surface. All restorations should be perfectly polished and cleaned. Stainless steel ligatures are preferable over elastomeric ligatures due to lesser tendency for plaque retention.

Various concerns that can be addressed to improve the effectiveness of perio-restorative problems are as follows[3]:

1. Improving the axial inclination of teeth, thereby improving root positioning with sufficient bone between roots for good vascular supply and proper contact area;
2. Attaining and maintaining parallelism of abutment teeth and better stability achieved by less tooth cutting for fabricating prosthesis;
3. To improve vertical osseous defects and root-crown ratio of damaged teeth up to one third of cervical line, extrusion of posterior teeth can be done;
4. Rather than achieving an ideal occlusion, the best possible outcome should be targeted.
5. Maintaining anterior teeth in a slightly procumbent position for a good lip support of flaccid and long upper lip.

Aesthetic concerns:

One of the main reasons that a number of adult patients are opting for orthodontic treatment is that a variety of aesthetic options are available to the patient e.g. aligners, ceramic or lingual brackets. All these options have made the appliance socially acceptable. Adults may not be comfortable with wearing headgears due to aesthetic reasons and therefore, intraoral anchorage devices such as palatal arches and controlled forces are more suited. Micro-implants can also be used to avoid dependence on teeth for anchorage[6, 15]. Apart from

aesthetic concerns, patients may also face psychological issues in adapting to a new appliance as compared to younger patients. Also, ulcerations and soreness may take a longer while to heal[16].

Relapse:

Permanent retention and splinting of teeth is usually required in adult patients since the equilibrium between the forces and centre of resistance is disturbed due to its shift in position apically. The teeth are also more prone to spontaneous migration[17, 18].

Outcome of treatment

The best possible results should be achieved with treatment both subjectively (in terms of facial attractiveness) and objectively (in terms of a Class I molar or canine relationship). According to several studies, adult patients who have undergone orthodontic treatment possess more confidence and self esteem and are highly motivated to maintain the good oral hygiene and made regular visits to the dentist after conclusion of treatment[19].

References

[1]. Proffit WR, Fields HW, Sarver DM. Contemporary Orthodontics. 4th eition, Mosby: St Louis; 2007.
[2]. Gazit-Rappaport T, Haisraeli-Shalish M, Gazit E.Psychosocial reward of orthodontic treatment in adult patients. Eur J Orthod 2010;32(4):441-6.
[3]. Vanarsdall RL, Musich DR. Adult orthodontics: Diagnosis and treatment. In: Graber TM, Vanarsdall RL, Vig KWL (eds). Orthodontics : Current principles and techniques. 4th edition, St Louis: Mosby, 2005.
[4]. Brown DF, Moerenhout RG. The pain experience and psychological adjustment to orthodontic treatment of preadolescents, adolescents, and adults. Am J Orthod Dentofacial Orthop 1991;100(4):349-56.
[5]. Tulloch, JFC (1993) Adjunctive treatment for adults. In Contemporary Orthodontics, Mosby-Year Book, St. Louis, pp. 554-584.
[6]. Nattrass C, Sandy JR. Adult orthodontics—a review. British journal of orthodontics. 1995 Nov 1;22(4):331-7.
[7]. Proffit WR, Fields Jr HW, Moray LJ. Prevalence of malocclusion and orthodontic treatment need in the United States: estimates from the NHANES III survey. The International journal of adult orthodontics and orthognathic surgery. 1998 Jan 1;13(2):97-106.
[8]. Sheridan JJ. The readers's corner. J Clin Orthod 2005; 39: 219- 234
[9]. Breece GL, Niebeg LG. Motivations for adult orthodontic treatment. J Clin orthod. 1986; 20: 166-171
[10]. Bond JA. The child versus the adult. Dent Clin North Am 1972;16:401-412.
[11]. Burkitts TM, Profitt WR. Referring Adult Patients for orthodontic treatment. Journal of the American Dental Association, 1990; 130(1): 73-79
[12]. Peter Diedrich, Ulrike Fitz, Gero Kinzinger. Interrelationship between Periodontics and Adult Orthodontics. Perio. 2004; 1(3): 143-149
[13]. Charles S Greene. 1988. Orthodontics and Temperomandibular disorders. Dental Clinics of North America. 32(3): 529- 538
[14]. Malmgren O, Levander E, Graber TM, Eliades T, Athanaiou AE. 2004. Minimising orthodontically induced root resorption – risk management in orthodontics: Experts guide to malpractice. Quintessence Publishing Co., 61-74
[15]. Tayer BH, Burek MJ. A survey of adults' attitudes toward orthodontic therapy. Am J Orthod 1981;79(3):305-15.
[16]. Buttke TM, Proffit WR. Referring adult patients for orthodontic treatment. J Am Dent Assoc 1999;130(1):73- 9.
[17]. Vanarsdall & Graber: Current principles and techniques.1985; St Louis CV Mosby Co 791-856.
[18]. Bishara SE. Textnook of Orthodontics. WB Saunders Co2001: 494-531.
[19]. Harris EF, Baker WC. Loss of root length and creastal bone height before and during treatment in adolescent and adult orthodontic patients. American Journal of Orthodontics and Dentofacial Orthopedics. 1990 Nov 1;98(5):463-9.

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