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RESEARCH ARTICLE

ADULT ORTHODONTICS – A LITERATURE REVIEW

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ABSTRACT

Aim: This article aims at giving a better understanding about the recent advancements used in the orthodontic treatment of adults. **Background:** Dentition is an important component of appearance. Ideal occlusion and spacing are the cornerstones of good dentition. Malocclusion not only affects hygiene and health of oral tissues but it can also lead to poor self esteem. There has been an increase in awareness about orthodontic treatment available for adults in recent years. This article aims at reviewing the different methods available for treatment of adult patients. **Reason:** This article gives an insight into the multidisciplinary approach of adult patients undergoing orthodontic treatment.

INTRODUCTION

An increasing number of orthodontic patients are adults. A survey done by the Journal of Clinical Orthodontics in 2013 found that adults make up 23% of orthodontic patients as compared to just 10% fifteen years back (Keim, 2013). With the increase on the emphasis of aesthetics in our society today, these numbers will only get larger. Treating an adult patient is more or less similar to treating an adolescent patient but there are certain aspects in which there are major differences namely psychological, mechanical and biological. All these factors will play a key role in determining the effectiveness of dental care provided to the patient.

Types of adult patients

According to Profitt (Profitt, 1999) there are two types of adult orthodontic patients. The first group wants to receive comprehensive dental treatment whereas the second group wants some sort of adjunct orthodontic therapy. The first group of patients is usually young adults who would not have been able to afford orthodontic treatment as teenagers, but now have the means to get their orthodontic problems resolved. The second group will require orthodontic treatment in order to facilitate some other dental treatment such as restorations, prostheses or implants.

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These patients are usually middle aged, in the forty to fifty age groups. They are usually referred to an orthodontist by their dentist and will not be completely interested in the treatment except as a means of completing their original treatment. However according to Tarraf (Tarraf, 2015), a third group of adult patients also exists. They are the relapse patients. These patients have previously received treatment as adolescents but the treatment has now relapsed and they wish to realign their teeth.

Factors affecting the treatment of adult patients

Various factors to be considered while treating adult orthodontic patients are (Dinesh K Bagga, 2010).

- Psychosocial factors
- Aging of tissues
- Lack of growth potential
- Periodontal problems
- Temperomandibular disorders
- Increased chance of root resorption

PSYCHOSOCIAL FACTORS

The first step of treating any adult patient is to understand their expectations. They usually have extremely high expectations. It is important to judge the attitude of the patient. It is also important to make the patient aware about the duration of treatment.

Some adult patients may not want to commit themselves to long term treatment (Sheridan, 2005). The patient had to understand that no change will occur overnight. Counseling may also be provided to the patient if deemed necessary. It is important to deal with any psychological issues that the patient may have before commencing treatment. Adult patients are extremely curious about all aspects of the treatment and will have questions about the duration of treatment, the difficulty of the process of correction, the materials and methods used, etc. The orthodontist has to be able to satisfy all their queries. These patients will also be extremely demanding about the kind of treatment they want. It is up to the orthodontist to gain their trust and convince them about the treatment.

Aging of the tissues: Age is an important parameter which affects the treatment planning for adult patients. Aging is usually linked with numerous biochemical changes which take place like decreased vascularity, change in the blood flow, increased bone resorption and collagen rigidity and alteration in the bone remodeling mechanism. These changes may be physiological or pathological. Nevertheless these changes and modifications have not been found to hamper orthodontic treatment (Breece, 1986; Harris, 1990).

Growth Potential: Another factor which is crucial to treatment is growth potential. Growth and aging go hand in hand. The potential for growth decreases as a person ages. Lack of growth may impose certain limitations on the extent of correction that is possible. Though adults have some amount of cranial and facial growth, it does not have great value in the correction of skeletal and dental malocclusions (Burkitts, 1990). Extremely severe malocclusions have to be treated surgically as growth modification appliances cannot be used. Orthodontic treatment will involve the movement of teeth, orthognathic surgeries for corrections of skeletal anomalies and dental camouflage (Dinesh K Bagga, 2009). Dental camouflage as the name suggests just manages to hide or conceal the malocclusion instead of correcting it. It is a less than ideal solution to orthodontic problems and, more often than not, will leave the patient disappointed and unhappy.

Periodontal problems: A number of links exist between periodontology and orthodontics. All orthodontic intervention has a periodontic dimension. Orthodontic mechanics and treatment planning are closely related to periodontal parameters such as length and shape of roots, structure of gingiva and width and height of alveolar bone (Peter Diedrich, 2004). The only way to avoid problems to the periodontium is to continuously, at regular intervals, monitor periodontal health. Monitoring of periodontal status requires plaque removal from all surfaces, especially from the gingival crevices and interproximal areas. If periodontal health is not maintained, it could lead to the destruction of the periodontium and will lead to failure of the orthodontic therapy being carried out.

Temperomndibular disorders: Adult patients are more predisposed towards developing temperomandibular disorders than adolescents. This development of temperomandibular disorder may have nothing to do with the orthodontic therapy being given to the patient. Orthodontic thinking about temperomandibular disorders originated from the writings of J.R.Thomson (Thompson, 1962; Thomson, 1986). Additional research was carried out by Ricketts (Ricketts, 1964) with the help of radiographs and Perry (Perry, 1957) and Jarbak

(Jarabak, 1956) who both used electromyographic studies to further the understanding of the orthodontic influence on temperomandibular joint disorders. These studies in the beginning showed a significant difference in between normal individuals and patients with temperomandibular disorders. However later studies and reviews showed that no clear cut difference was visible either radiographically or electromyographically. A more shocking development came later, when some orthodontists published papers attributing the temperomandibular disorders to improperly finished orthodontic cases (Perry, 1957; Jarabak, 1956). Later studies conducted by orthodontists addressing this accusation (Larson, 1981; Sadowsky, 1984), found that post orthodontic patients were no more susceptible to temperomandibular disorders than patients with untreated malocclusion who had never undergone orthodontic treatment or people with normal occlusion (Charles, 1998). Some adult patients may seek orthodontic treatment for temperomandibular disorders. Whatever may be the case the patients need to be cautioned about the chances of developing temperomandibular disorders not necessarily due to orthodontic therapy (Profitt, 2007). They must also be warned about the limitations of orthodontics in treating this disorder (McNamara, 1995).

Resorption of root: Adult patients must be informed about the possibility of root resorption. They should be thoroughly evaluated for their susceptibility to root resorption ^{(21) (22) (23)} before the treatment starts. If there is no sign of root resorption at the beginning of the treatment, the patient must again be checked around six to nine months later (Mirabella, 1995). This can be easily checked using IOPA radiographs. On the other hand if root resorption is present before the treatment begins, then the patient must be assessed every three months (Malmgren, 2004). The treatment should not be started until the resorption of root can be impeded and treated somehow. In order to address all these issues often adult orthodontics requires an interdisciplinary approach. It is imperative to understand that each patient is unique and that the treatment must be planned accordingly while considering all factors that will impact the treatment.

Types of adult orthodontic treatment: As previously mentioned in this article there are two types of adult orthodontic treatment – comprehensive and adjunctive ⁽²⁶⁾.

Adjunctive orthodontic treatment: The goal of adjunctive orthodontic therapy is to facilitate disease control and restore function. It is usually done before the placement of an implant. This type of orthodontic treatment can be performed even by a general practitioner, provided the practitioner is able identify the need for treatment. Mostly removable appliances are used in this type of treatment and the duration of the treatment is also short, lasting about three to six months. It is indicated in cases of extrusion, cross bite, molar uprighting, space redistribution and incisor alignment.

Comprehensive orthodontic treatment: Comprehensive treatment is usually carried out with the aim of achieving ideal occlusion. This type of treatment must be carried out only by an orthodontic specialist. It is used in case of unappealing aesthetics or malocclusions that compromise oral hygiene. The appliances used in this type of treatment are fixed appliances which cover either one or both arches. The duration of treatment is longer than adjunctive therapy and may last anywhere from nine months to two years.

It is usually indicated in cases of open bite, deep bite, Class II malocclusions, Class III malocclusions, skeletal excess or deficiency.

Prevalence of malocclusion among adults: Recent studies have shown that the prevalence of malocclusion among adults is quite similar to that of children and adolescents (McLain, 1995). A study conducted by Searcy and Chick (Searcy, 1994) among US army recruits found that 77% of recruits had a malocclusion that would improve with comprehensive orthodontic treatment while 16% of the recruits were found to have severely handicapping type of malocclusion. Another study conducted in Western Europe found that the prevalence of malocclusion among adults is between 40% to 76% (Brunelle, 1996; Profitt, 1998). A study conducted in a private college in India showed that many people have no idea that they have a malocclusion and therefore refrain from obtaining treatment (Khatri, 2014). The prevalence of malocclusion among adult patients confirms that adults do require orthodontic treatment and may actually benefit from orthodontic therapy.

Treatment concerns for adults: Bruce and Niebig (Breece, 1986) reported that 50% of adults who participated in their study said that they would feel embarrassed about wearing orthodontic appliances. However out of the adults who sought treatment, only 20% said that they felt it would have an adverse social effect. But in such cases their friends and families were extremely supportive (Chumbley, 1986; Tayer, 1981). As of today, more number of adult patients are opting for orthodontic therapy as there is an increased social acceptance of such treatment. The mount of fear and embarrassment among patients has also diminished to a large extent. Apart from this newer advancements such as transparent or tooth coloured brackets and the introduction of lingual orthodontics has totally revolutionized the field of adult orthodontics. Some of the other reasons given by adults for not seeking treatment were high cost, duration, fear and lack of awareness⁽³³⁾. But recent studies have shown that though orthodontic therapy is mildly painful, this discomfort lasts only for about two days (Chumbley, 1986; Tayer, 1981; Harris, 1990). The discomfort is usually relieved by taking analgesics and eating a soft diet for a period of three days.

Treatment Outcomes: For any treatment to be considered successful, it must achieve its objective and subjective goals which were identified at the start of the treatment. Objective goals are the goals that are defined by the orthodontist and subjective goals are those that are defined by the patient. Several studies have found that patients have greater self confidence and a more positive body image after orthodontic therapy. Some patients also reported that they felt they had better career opportunities and an improved social life after treatment (Brown, 1991). Most adult patients were also more motivated to maintain good oral hygiene and visited a dentist regularly after the conclusion of orthodontic therapy (Burkitts, 1990). Thus providing good orthodontic treatment is an advantage to both the patient as well as the orthodontist.

Conclusion

Many adults have malocclusions that can be corrected either by adjunctive orthodontic therapy or comprehensive orthodontic therapy.

But before starting treatment, the patient must be carefully evaluated for systemic diseases, periorestorative problems, root resorption and temporomandibular joint disorders. All systemic and dental diseases should be appropriately treated and managed before starting orthodontic therapy. An individualized and unique treatment plan needs to be formulated for each patient based on careful evaluation of all the parameters and factors. Patient must be made aware of all possibilities, advantages, limitations and drawbacks before beginning treatment.

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