

A Review on Factors Influencing Treatment Time In Orthodontic Patients

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ABSTRACT

Background: This article reviews the different factors influencing the duration of orthodontic treatment. One of the first concerns of new orthodontic patients, apart from the outcome, is the duration of treatment. A better understanding of orthodontic treatment duration as well as factors affecting the treatment duration is useful for efficient patient counselling and improved clinical practice. Orthodontic treatment time is influenced by a number of clinical decisions and patient factors. Change in operators and appointments, interappointment duration longer than 6 months, extractions, rebounds, alignment of impacted tooth, starting treatment during mixed dentition stage and treatment type were factors which influenced treatment time.

Keywords: Orthodontics, treatment duration, patient co-operation.

INTRODUCTION

An accurate judgement of treatment duration by an orthodontist is crucial for a successful practice⁵. Every potential orthodontic patient is keen to know the total duration of the treatment proposed as it involves commitment, compliance, financial and logistic implications on the patients and family¹². Timely completion of treatment allows for a more accurate prediction of costs and the ability to treat more patients⁹. From a patient's (or parent's perspective), shorter treatment times have an impact on lifestyle, and, from an orthodontist's point of view, patients are vulnerable to compliance "burnout"⁵.

When conducting an initial consultation, every clinician is called upon to answer questions regarding the duration of the treatment proposed⁷. The answer to this question usually depends, among other factors. On the clinician's experience,

which depend on his educational background, technical skills and practice management methods⁶. Patients who are given accurate information also appear to be better consumer of dental services, with more reasonable expectations of treatment outcomes³.

The British Orthodontic Society recommends that patients should receive sufficient information about the proposed treatment, including a realistic estimate of time scale involved and the retention phase of the treatment.(Warren, 1999)¹⁰.

A few studies since 1960 have examined orthodontic treatment time. Beckwith et al conducted the most extensive study and found an average treatment time of 28.6 months (range-23.4-33.4) among five practices².

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The putative determinants of orthodontic treatment time can be divided into 4 broad categories:

Sociodemographic characteristics, malocclusion characteristics, treatment method and patient co-operation.

SOCIODEMOGRAPHIC CHARACTERISTICS

The influence of sociodemographic characteristics including age, sex, and socioeconomic status on treatment time is unclear. Although some studies have reported that chronological age was not significantly associated with treatment time, others have found the opposite, and it has been asserted that stage of Dental development (rather than age) at the treatment commencement might affect treatment time. Age is associated with patient cooperation; younger patients are more cooperative than older ones. Longer treatment times for boys have been a common finding, if not a consistent one. Controversy exist over the socioeconomic status on cooperation and treatment time, with no clear consensus on whether a lower socioeconomic status is associated with a shorter or longer treatment time⁸.

MALOCCLUSION CHARACTERISTICS

Malocclusion characteristics have been suggested to influence treatment time. Vig et al found not only that Class II or Class III malocclusion took longer to treat, but also that there are interactions between malocclusion type and other variables : the effect of missed appointments was twice as great in class II patients; patient cooperation reduced treatment time for class II but not class I patients: and more experienced clinicians treated class II malocclusion in less time than class I patients. Wenger et al observed that treatment time for class I malocclusion was less than that for class II or class III malocclusion. Although differences in the anatomy and malocclusion eg: high pretreatment ANB angle and low Mandibular plane angle, large overjet and buccal occlusion, have been reported to influence treatment time⁴.

TREATMENT METHOD

The treatment method chosen (extraction vs non-extraction) has been reported to influence treatment time. Extractions have been linked to longer treatment time, and premolar extractions

appear to be particularly significant, although the influence of extraction and non-extraction approaches on treatment time remains controversial, with some studies reporting no difference. Among the studies that reported a difference, treatment time for patients treated with an extraction modality average atleast a month longer. Shia reported that altering the treatment approach in midtreatment was a significant cause of time overruns, specifically when nonextraction treatment was started, but extractions were done later during treatment (delayed extractions). Another important treatment-method variable might be differences among clinicians in the time spent in detailed finishing procedures, although this is also controversial⁶.

PATIENT COOPERATION

Patient cooperation accounts for much treatment time variation; the major considerations are keeping scheduled appointments; cooperation in wearing elastics; refraining from activities that could distort the archwires and remove bonded brackets, leading to appliance breakages or repairs ; and adequate oral hygiene¹⁰. Laxity in following instructions might lead not only to a compromised result but also to slow treatment progress, 'wasted' clinic time and frustrations. Patients with good oral hygiene have also been described as more likely to cooperate with other aspects of treatment. Beckwith et al reported that the number of brackets and bands replaced during treatment was the second largest contributor to treatment time variance⁴.



Fig 1: Broken lace in mandibular right canine.



Fig 2: Broken archwire poking the gingival tissue.



Fig 3: Debonded bracket in maxillary first molar.

CONCLUSION

It was observed that factors correlated with the treatment time were missed appointments, breakages and increased pretreatment lower incisor proclination. It was reported that each missed appointment and breakage increase the treatment duration by 1 and 0.4 month respectively¹¹. An increase of 0.3 month in the treatment duration is observed with a single degree rise in the pretreatment lower incisor inclination⁵. There is insufficient scientific evidence concerning treatment duration for some of the relatively new orthodontic modalities (such as the Invisalign technique and orthodontic mini-implants)³.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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