

## Why do some orthodontic treatments last so long while others do not?

David Normando<sup>1</sup>

*“Doctor, when will I get my braces off?”*  
(millions of patients around the world)

Undoubtedly this title question is the one that most often echoes in our ears and reverberates in our minds. Trying to predict the duration of an orthodontic treatment is an invitation to commit mistakes, a path we insist on trekking.

Any orthodontist has already experienced that orthodontic treatment duration presents a huge variability, depending on different variables inherent to either the professional and/or the patient. But probably there is something else involved, still unknown. While orthodontists, we need to understand that variability is inherent to biology. Variability is a much more interesting measurement than the mean itself.<sup>1</sup> For this reason, we can easily find among our files, clinical cases that lasted less than 12 months and others that taken more than 36 months. Which one you will show in your next lecture or for your next patient will depend on your honesty.

I notice some kind of uncomfortable feeling in the audience every time I mention this subject during scientific meetings and ask this question:

“Is there anyone here in this room who has worked for more than 10 years as an orthodontist and has no treatment that lasted more than five years?”

Since 2011, I’ve been asking this question and until today, there wasn’t at least one of those orthodontists who has raised the hand. If the answer represents a clinical reality, why do we pay attention to this subject only when a new product or technique comes up as a redeemer of changes in our daily practice?

After all, what interferes in treatment time? Scientifically, there are some signs. The strongest one comes from the patient himself. Before we reach the era of personalized Orthodontics<sup>2</sup> — when it will be possible to apply Molecular Biology knowledge in Orthodontics, individualizing patient’s response to orthodontic mechanics —, we need to think on how patient can interfere to reduce, or increase, the time of his/her own treatment.

The patient’s collaboration seems to be the master key. Some studies have investigated the influence of this factor, measuring it by the amount of missed appointments, patient’s motivation in using intraoral elastics, and bonding failures. Results indicate that almost 50% of variability in treatment time is in patient’s hand.<sup>3,4</sup> So if you have the competence of making your patients cooperate, you’ll be able to turn their treatment on average 50% shorter. In the literature, these variables seem to be the most important factors explaining such variability in orthodontic treatment time. Since we are not able to make accurate predictions regarding our patients’ cooperation, it seems reasonable to assume that the possibility of precisely predicting the duration of orthodontic treatment is mitigated.

Patients, their parents and us, orthodontists, are all interested in adjunctive interventions that accelerate treatment time, with a clear preference for non-invasive methods.<sup>5</sup> Starting from this premise, I won’t discuss, here, the methods involving surgeries or medications.

<sup>1</sup> Adjunct professor, Universidade Federal do Pará (UFPA), School of Dentistry, Belém, Pará, Brazil. Coordinator, Universidade Federal do Pará (UFPA), Graduate program in Dentistry, and ABO-Pará, Specialization course in Orthodontics, Belém, Pará, Brazil.

Among non-invasive methods, some possibilities have been investigated, e.g., the use of self-ligating brackets, microvibrations and low level laser therapy.

Several randomized clinical trials have attested that, compared to conventional brackets, self-ligating brackets do not offer advantages in reducing orthodontic treatment time.<sup>6-8</sup> Orthodontic science has seldom given such a strong evidence on a specific issue. Marketing has calmed down, but we still hear empiricism crying out, even though more and more distant.

Another possibility would be to use effects produced by microvibrations. A systematic review produced by the Cochrane group<sup>9</sup> concluded that it is not possible to determine whether there are any positive effects of this adjunctive method, aiming at accelerating tooth movement. Thereafter, a randomized clinical trial<sup>10</sup> corroborated that in patients treated with Edgewise fixed appliances, the additional use of vibrations did not reduce treatment time until reaching the final alignment. Due to its high cost, around one thousand dollars, these devices have not been widely used in Brazil, while in the United States these devices are indiscriminately used and some patients are judicially claiming what they consider to have spent in vain.

The use of low-level laser seems to be an alternative. A randomized clinical trial published in 2017<sup>11</sup> demonstrated about 25% of reduction in the time spent for dental alignment. However, the effects of this protocol on total treatment time have not yet been investigated in a scientifically sound study. In addition, the costs, the risks involved in the procedure, and the time required for the application of the laser represent some of the difficulties for its systematic use in orthodontic practice.

Obviously there are other possibilities. Improving your knowledge of biomechanics — and that also means controlling the appliances you use —, using mini-implants and simplifying treatment planning, when possible, are ways to improve the efficiency of your treatments.

The industry is opportunistic and knows that you have nightmares thinking on that fateful question by several of your patients. If they are questioning, so

are you. If it takes away your sleep, even more theirs. But remember: so far, “miracles” have not yet been confirmed by science, and many of us will have believed in false assertions in the name of clinical evidence. So, for now, take the chance to text message or call your patient asking him/her to remember to wear the elastics, don't chew hard consistency food, and don't miss his/her orthodontic appointment. Studying will help you to get a better understanding of science and not to fall into temptation. Yes, we know it is not easy, but that's what we have for today.

David Normando

Editor-in-chief (davidnormando@hotmail.com)

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