

## Orthodontic brackets – between passion and science

*Passion is an unbalanced love.  
Science is an investigative love.  
Truth is love which perpetuates.*  
(Chico Xavier)

In Orthodontics we grew up with passionate discussions around brackets. During Orthodontic's childhood we contemplated brackets systems that have been stamped as the "last and best" — to paraphrase Angle — but that vanished even before we reached Orthodontic's adolescence. Topics such as slot dimensions, influence of manufacturing material and, recently, the ligation system, are eloquently debated. Leaving alone high-spirited discussions, the lack of scientific information regarding the influence of the bracket system on treatment efficiency is frightening. It is important to understand efficiency as good results with short treatment time.

While there are few studies which would offer us good scientific background on bracket slot (0.018-in or 0.022-in) or prescription (Straight-Wire or Standard Edgewise) choice, orthodontic science has produced an enormous amount of clinical trials to prove the efficiency of self-ligating brackets.

At the beginning, a great number of laboratory studies have demonstrated friction reduction with self-ligating brackets compared with conventional ones. However, the power of these studies, as with this editorial, isn't enough to justify the system choice or the treatment speed. There are limitations in this study design in representing what really happened in the oral environment.

A question arises here regarding the reliability of the study designed to investigate the effectiveness of self-ligating brackets on orthodontic treatment. The gold standards for health clinical studies are randomized trials. How are they designed? Why are they ideal for researches?

For randomized clinical trials researchers select patient groups with similar characteristics regarding malocclusions, called inclusion criteria. Treatment type (conventional or

self-ligated for example) is determined randomly, most of the time by a computer program. Even the orthodontist that will treat the case is chosen in the same manner, in order to eliminate the operator effect. In this way, neither the patient, nor the professional will have any influence on the treatment choice and result.

Once patients have been allocated randomly into their respective groups, the cases are monitored to the end. Data such as treatment time, quality of results, patient abandonment and other variables are collected. It is assumed that differences shown at the end of the study are an exclusive consequence of the treatment option.

I am not aware of any randomized clinical trial showing how Straight-wire brackets are more effective than standard Edgewise or how 0.018-in slots are better than 0.022-in ones. Would metal brackets produce better results than the ceramic ones?

What about self-ligating brackets? Are there any randomized studies about their efficiency? Yes, there are. What kind of information do they offer? These studies are consistently — and uniquely — showing no benefits in using self-ligating brackets to reduce treatment time with quality final results. There are plenty of studies proving this and by the time this article reaches you, there will be even more.

Unfortunately, in Orthodontics, very frequently products are launched by the industry without scientific proof. This is unaccepted in Medicine. Based on this fact, the belief in a bracket-wire system that promises to answer our patient's key question — "When am I taking the brackets off, Doctor?" — is surprising.

Even though passion persuades us to hear a sweet answer, science remind us that truth is yet to come, and seems not to be hidden in metal clips or slide ligatures.

We are left with the need to dive into science, to find the answers to shorten treatment time. In the meanwhile — and science always has space for an appealing “while” — there is no reason to change our bracket system with the goal of treatment time reduction.

However, there is always something good to take from different systems. With self-ligating brackets there is enough clinical and scientific evidence that they reduce chair time since the opening and closure of bracket clips is faster than changing elastic modules by about 2 minutes. If you have a busy practice, this will make a difference at the end of the day. But apart from this it can't be counted as an advantage.

Another reason to choose self-ligating brackets is to avoid the inconvenient discoloration of clear elastic ligatures, a constant issue for patients with esthetic brackets.

With regard to its convenience for orthodontists, there is a strong feeling that self-ligated brackets constitute a one-way street in Orthodontics. Treatment costs are significantly reduced, however, orthodontic science hasn't confirmed them as a tool to reduce treatment time. Unfortunately, many young orthodontists who believed, or still believe, in this promise will later realize the power of the message in the epigraph.

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