

## Letters to the editor

### Twin Blocks designed for 24-hour wear

As the originator of Twin Blocks, I wish to contest the protocol and advice presented in the randomized clinical trial (RCT) on Twin Block therapy published in the February issue (Parekh J, Coughlan K, Fleming PS, Pandis N, Sharma PK. Effectiveness of part-time vs full-time wear protocols of Twin Block appliance on dental and skeletal changes: a randomized controlled trial. *Am J Orthod Dentofacial Orthop* 2019;155:165-72). My intention in making this criticism is to avoid a potential increase in the failure rate if part-time wear is adopted in preference to full-time wear.

In the original description of the Twin Block protocol, I wrote that "Twin Blocks are designed to be worn 24 hours per day to take full advantage of all functional forces applied to the dentition, including the forces of mastication."<sup>1</sup> The most crucial time to establish good cooperation with the patient is in the first few days after fitting the Twin Blocks, when the patient is learning to adjust to the new appliance. Twin Blocks have the unique advantage compared with other functional appliances that they can be fixed to the teeth. Such temporary fixation guarantees full-time wear, 24 hours per day, and excellent cooperation is established at the start of treatment.

After 10-14 days, when the patient has adapted to the Twin Block and is wearing it comfortably, the appliance can be removed. If cooperation is doubtful at any stage of treatment, the operator should not hesitate to fix the appliance in for 10 days to regain control and restore full-time wear. After 10 days of full-time wear, the patient is more comfortable with the appliance in the mouth than without it.

These tissue changes are reflected in the clinical signs after fitting Twin Blocks. Within a few days the patient experiences pain behind the condyle when the appliance is removed. From the studies of histologic changes in animal experiments it may be deduced that retraction of the condyle results in compression of connective tissue and blood vessels and that ischemia is the principal cause of pain.

Temporary fixation of Twin Blocks therefore represents the best method of ensuring full-time wear and I have observed this conclusively over 4 decades of Twin Block therapy. In my opinion, Parekh et al did not follow

a reliable protocol for successful cooperation with the use of removable Twin Blocks.

A previous multicenter RCT in the U.K. led by O'Brien and Sandler<sup>2</sup> had a failure rate of 33.6%. The high failure rate was attributed to excessively thick occlusal blocks, which represented a departure from the original design and protocol for the Twin Block technique. This compares to a failure rate in my original D.D.Sc. thesis of 6.7% for 148 consecutively treated patients.

I strongly recommend that the findings of this RCT should be rejected in favor of temporary fixation of Twin Blocks to establish full-time wear as the treatment of choice. This protocol has been tried and tested for 4 decades and is the most effective approach to maximize cooperation for mandibular advancement in Twin Block therapy.

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#### REFERENCES

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### Part-time vs full-time wear of Twin-block appliance: Can we rejoice?

With great enthusiasm, we read the article comparing part-time (PT) and full-time (FT) wear protocols for the Twin-block appliance (Parekh J, Coughlan K, Fleming PS, Pandis N, Sharma PK. Effectiveness of part-time vs full-time wear protocols of Twin-block appliance on dental and skeletal changes: A randomized controlled trial. *Am J Orthod Dentofacial Orthop* 2019;155:165-72). This was a much-awaited study for

any clinician who treats Class II malocclusion with removable functional appliances. We thought the results of this research would be a "clinician's delight" and herald a paradigm shift in functional appliance wear time. However, upon thorough perusal of the manuscript, we sensed some concerns along with queries that needed addressing.

The authors claimed that this was the first study to demonstrate no significant differences in skeletal and dental parameters in patients treated with functional appliances prescribed for either PT or FT wear. However, we found this statement to be erroneous because the mean wear time in the FT group was only  $12.38 \pm 5.89$  hours, which does not qualify to be designated as FT wear. The outcomes might have differed had the subjects complied with the prescribed wear regimen.

Incremental advancement,<sup>1</sup> FT wear,<sup>2</sup> and optimum skeletal age for treatment<sup>3</sup> have been considered the 3 pillars for successful functional appliance therapy for maximum skeletal change. Mills and McCulloch<sup>4</sup> reported that the average change was 4.2 mm greater in the Twin-block group compared with untreated controls. However, the investigators relied only on ANB angle for monitoring the skeletal response. Although the linear mandibular length (Ar-Gn) was recorded at baseline, posttreatment change was not reported.

The dichotomy of FT vs PT wear has been a much-debated topic. Dr Clark<sup>2</sup> claimed that only FT wear could induce the necessary pterygoid response. Although there are no differences between the 2 groups, the study does not offer any biological explanation for the same. Had the subjects used the appliance for 22 hours, the changes might have been different.

We would like to raise the following queries to the authors:

1. What made them consider a 2-mm overjet reduction to be clinically significant in Class II, Division 1 malocclusion? With a pretreatment overjet of more than 10 mm, a 2-mm reduction is highly inappropriate.
2. Although it is rightly mentioned that the external validity could be doubtful owing to a hospital-based sample, we believed that it could still be diluted because of "contamination between intervention groups." This is because all subjects were of the same peer group, receiving different instructions for the same appliance. There is no evidence in

the article regarding any precautions against a contamination bias.<sup>5</sup>

3. Why was the posttreatment linear skeletal change using Ar-Gn not considered to be important?

This good work should initiate a series of further multicentric research clinical trials based on a strict FT wear regimen, which can quantify the skeletal and dental response accurately before accepting the PT hypothesis. However, to a compliant patient who is ready to wear the appliance according to the doctor's instructions, it would be inappropriate to tell him or her that PT wear of the appliance is "OK" in light of this research. Hence, the wait must continue before we rejoice.

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## Authors' response

**W**e thank our colleagues for their keen interest in our article. We agree that a mean wear time of 12 hours does not represent full-time wear. As such, we highlighted this as an outcome of the study and referred to