

Orthodontic Science and Practice Foundation
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Orthodontics and Practice Interview
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Doctor Jay Bowman is one of a kind, not only for his passion for orthodontics, good music and travel, but also for being an incredible person and a generous human being, which results in many devoted friends around the planet!!! He has an extensive curriculum as member of the *Edward Angle Society of Orthodontists*, *Diplomate of the American Board of Orthodontics* and fellow of the *College of Diplomates of the American Board of Orthodontics*. Among other accomplishments, Dr. Bowman is fellow of the *Pierre Fauchard Academy*, the *American College of Dentists*, and a founding member of the notorious *World Federation of Orthodontists (WFO)*.

As professor at the renowned *University of Michigan*, he developed a teaching course focused on straight wire mechanics. In addition, Dr. Bowman is an associate professor at *Saint Louis University*, where he was honoured with the Alumni Merit Award in 2005, assistant professor at *Case Western Reserve University* in Cleveland, Ohio, and a visiting professor at *Seton Hill University* in Greensburg, Pennsylvania. With remarkable clinical experience, Jay Bowman gave more than 300 lectures in 39 American states and 36 countries. He had more than 150 papers and book chapters published abroad, including his book "*Mini-implants in Orthodontics - Innovative Anchorage Concepts*" (Quintessence), and maintained a continuously successful clinical practice for over 30 years in Kalamazoo, Michigan. He recently received a merit award from the *Orthodontic Education and Research Foundation*.

It is with great pleasure and honour that we coordinate this stunning interview, kindly and diligently given by doctor Jay Bowman on topics of great interest nowadays such as skeletal anchorage, clear aligner mechanics optimization, the use of the *Carriere Motion Appliance* within a more objective hybrid approach, in addition to valuable topics such as the future of orthodontics and the threat of "direct-to-consumer" systems, finishing with a tribute to Prof. Lysle Johnston. Besides me, professors Alexandre Moro from Curitiba, PR, and Ernesto Rodrigues from Muriaé, MG also made questions, who collaborate with the impressive result that we can verify in the interview below.

Mauricio Accorsi

Editor of the Digital Dentistry in Science

Dr. Jay Bowman

How to cite this article:
Bowman J. Interview. Orthod. Sci. Pract.
2021; 14(53):8-13.
DOI: 10.24077/2021;1453-813

Questions from Dr. Mauricio Accorsi

1. We understand that there are several systems, and online platforms that allows orthodontists to outsource one of the most important treatments' phases, which is known as the "virtual setup", when we are talking about "digital orthodontics". We also know by recent released information, that most of these setups are approved without any revision. Therefore, would we be transferring our responsibility to the industry, that seems not to be interested to assuming bad outcomes, only the success and beautiful cases to use as propaganda? Is there anything that we can do, in order to keep our importance as healthcare providers? Considering that the basics of the profession as diagnosis and therapeutic decision making are the same, do you think that investing in our own (third-party) software and learn how to use it, would be a wise thing to do, instead of buying the next "nespresso" intraoral scanner, and help the industry to be more and more powerful?

The hallmark of our specialty, the *raison d'être*, is our training and knowledge of diagnosis. We combine the skills of Angle's "tooth regulation" with the never-ending pursuit of understanding facial growth, tooth movement, and the effects of the methods that we expose patients that entrust their care with us. If we are allowing, in effect, the layperson to supplant any of these sacrosanct aspects of orthodontics, then we have surrendered our souls.

Certainly, we have all seen reasonable results that have been achieved by dentists dabbling in the specialty or even passable smiles from Direct-to-Consumer plastic, self-supervised by the patient. Unfortunately, the odds of that happening regularly are still poor compared to the higher average performance of licensed orthodontists.

All of digital set-ups of teeth and simulations of treatment effects do not seem to be sufficient to replace the real-time skills of the orthodontist. That's been clearly demonstrated in the numerous findings reporting the unpredictability of clear aligner treatments^{1,2}. There is certainly grumbling from the ranks that we have voluntarily "fed" the corporations our data to supply their "algorithms." In that manner, they have profited from our largess and now they're using that information to expand their market to the less orthodontically savvy general dentists or worse, to the Do-It-Yourself (box of plastic or pre-formed braces/wires) predatory disrupters. It's certainly been an orthodontic Catch-22.

When I was applying to orthodontic residency in the Dark Ages, I had an early Apple II+ computer and had hoped to create a cephalometric and model analysis program that might generate or "spit out" a diagnosis and specific treatment plan for each patient. Unfortunately, as my orthodontic education began, I

quickly realized the fool's errand that I was on. Thirty-five years later, that type of system still has not evolved. As the Editor of the AJODO, Buzz Behrents, has stated, "Orthodontics is simple . . . it's just not easy!"

Certainly, the advent of intraoral scanners and 3D printers are making inroads in orthodontics at least in terms of perhaps eliminating physical "impressions." But even with virtual modeling of tooth movement software, there are still limitations and certainly costs, including time substitution from clinic to lab, that cannot be ignored when looking at the tantalizing new, "shiny" toys. The question one asks is: will the resulting treatment actually be shorter in time, cheaper, and especially, better (more accurate, esthetic, functional, and stable)?

2. Do you think hybrid treatments are the way to go for future orthodontics, if so, can you tell us your recent experience using TADs and aligners?

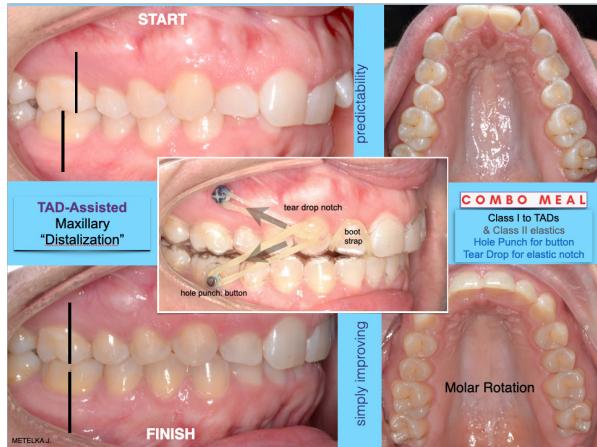
The concept of combining different methodologies together to facilitate specific orthodontic treatments has certainly been something that I have aspired to.

Although I was an early adopter of miniscrew anchorage and at the origins of clearaligners, I saw situations where the combination of a variety of tools in the orthodontic armamentarium could be quite handy. Although I've placed over 5000miniscrews, all that proves is that I could convince patients to permit me to insert them! It's no proof of superiority.

When clear aligners were first introduced, there was no real plan for skeletal discrepancies. In other words, the addition of intermaxillary elastics took innovation by early adopters to incorporate. Some mild-to-moderate Class II treatments were handled with elastics connected to "cuts" in the plastic. It was later determined that actual molar distalization of only 2.3 mm are typical; not enough to predictably handle a full-step problem (especially considering the limitations of compliance in wearing plastic and elastic)³.



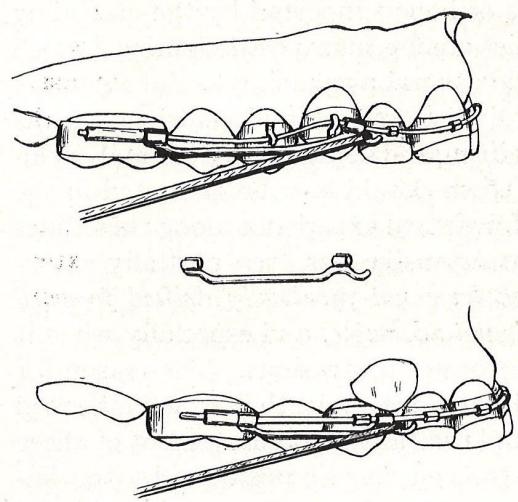
It seemed logical to incorporate miniscrews as a "solid" post to hook on intramaxillary elastics for a kind of "headgear effect" when connected to the upper aligners. If combined with typical Class II intermaxillary elastics, then the next vector of force is a more balanced distalization and even retraction, subsequent to extractions. The combination of braces and clear aligners seems an obvious approach in certain situations, especially when improved root positioning is required (e.g., torque, root paralleling, severe rotations, etc.).⁴



3. Do you have any experience with the Carriere® Motion™ Appliance, if so, would you consider to be an important part of this new hybrid approach that we could incorporate in our therapeutic arsenal?

I have experience with the Carriere "bar." It was once named a distalizer and now is a "motion." Neither appellation is accurate, as this simple device is incapable of moving anything on its own. If it were not for the introduction of intraoral "elastics" by Calvin S. Case⁵ in then this concept would be of no value. In fact, Case also introduced the same concept as the Carriere, he called "Span-Hooks" nearly a century ago.

FIG. 75.



The dilemma with these "bars" are cost, compliance, and untoward side-effects. It is a simple process to create your own bar using a segment of orthodontic wire, make a helix on one end that is bonded to the canine and the free end is inserted into a molar tube. A crimpable stop or bending an Omega loop in that wire against the molar tube and add an elastic and you're moving teeth - all for just a few dollars.

I have incorporated the "combination" noted above with the Carriere concept⁶. In other words, either an intramaxillary elastic or even elastic chain is stretched from the miniscrew between maxillary 2nd premolar and 1st molar to the "hook" at the canine. Class II elastics can also be applied from the same hook. The maxillary force helps to counteract the extrusion of the cupid and if elastomeric chain is used, then there is less reliance on patient compliance and a reduction of the attendant flaring or tipping of lower anteriors and vertical changes.



4. Do you see these several "Direct to Consumer" aligners' companies that are arising on the market every day and everywhere, as threats to Orthodontics, or something that has expiration date?

Unfortunately, it appears that the genie has been let out of the bottle and we are unlikely to stuff it back in there. The limits on DTC aligners include all of the issues we currently have with plastic provided by qualified orthodontic specialists - even after 20 years since their introduction (see improving predictability). In addition, it will nearly impossible for DTC to handle anything more than mild crowding and rotations. Anything involving a crossbite, Class II or III, deep bites, and openbites would be inherently problematic without at least some attachments (who is going to place those, the patient?), probably elastics, maybe miniscrews, and certainly some direct interaction with a specialty license. Those factors require resources and take time; therefore, the increased costs would be prohibitive for their basic business model. Sadly, we are seeing more complex types of malocclusions being "approved" with no guarantee that a patient's bite will be improved or at least not worsened.

Questions from Dr. Ernesto Rodrigues

1. What is your opinion over the use of distalizers and other fixed devices associated with clear aligners and what types of malocclusions are more suitable for starting the treatment within a hybrid protocol?

I have used several different methods of maxillary molar distalization with clear aligners. This has included sequential molar distalization programmed into the ClinCheck and supported by Class II elastics.

Compliance is key and the amount of actual distalization has been reported to be limited on average. I've also used Carriere concept of directing sectional distalization with Class II elastics as a precursor to upper aligners. Taking that a step further, I have added miniscrews in the buccal alveolus between maxillary 1st molar and 2nd premolar to connect intramaxillary elastics to hooks at the maxillary canine.

This has been combined with Class II elastics for a net distalization force to improve predictability and reduce untoward side effects from using the elastichook bar bonded from

molar to canine. Finally, I have also use the Horseshoe Jet⁷. In contrast, I have not been that fond of the effects of this distalization concept in the mandible, even when using miniscrews.



2. We know that some orthodontic movements have less predictability than others. What is the role of activation pliers to improve this predictability and at what is the best time to use these activations, after the loss of tracking be detected, or at the beginning of certain movements such as rotation or distalization, in order to increase predictability?

The Clear Collection instruments: The Horizontal and The Vertical are designed to permit "accent" indents to be placed anywhere needed without heating the instruments. The Vertical was meant to be used to assist in improving the predictability of rotational movements by enhancing rotational couples. The Horizontal instrument was designed to be able to add torque ridges wherever and whenever needed along the aligner. In addition, these instruments are used to place indents adjacent to attachments to increase the plastic contact to reduce "lag" or loss of aligner tracking. For instance, when attempting to extrude a tooth with horizontal attachment on a tooth, The Horizontal is used to place an indent adjacent and just gingival to the attachment. This increases the contact under the attachment to increase the fit of the plastic under the extrusive attachment⁸.



Questions from Dr. Moro

1. What is the best way to treat a Class II Subdivision malocclusion with the displaced lower midline, using clear aligners?

If this is an adult malocclusion, the dental midline is displaced away from the unilateral Class II side, then an attempt to address the specific issue might require the application of miniscrews to protract the dentition on the Class II side. This situation should be carefully evaluated as it may be due to condylar or skeletal asymmetry, so using clear aligners may not be ideal. It would be completely different in an adolescent, growing patient where there are many more options.

2. Why clear aligners have such a hard time treating deep bite cases? Have you ever tried "bite turbos" as lingual attachments?

Treating deep bite patients with aligners has been problematic as the accuracy of incisor intrusion was reported to be one of the most inaccurate movements identified by Charalampakis, et al. in 2018⁹. Consequently, the addition of "bite ramps" in the anterior certainly would seem to make sense, yet much of the mechanics are due to the "over-correction" that should be built into the computer simulation. In other words, think about the effects of a "reverse curve of Spee" NITI wire. I have also added miniscrews in the anterior in one or both arches to help with bite opening with elastics. Even then, the process seems to be slow and still unpredictable^{10,11}.

3. Many of our colleagues consider Professor Lyle Johnston to be one of the most brilliant minds in orthodontics. What are the main legacies that he leaves to us?

I agree and have been blessed to have had Lyle Johnston as my chairman at Saint Louis University, my mentor, and ultimately, my friend. Johnston's lectures and his research publications have answered so many questions in our specialty that we will continue to build

upon or sadly, some will forget those lessons and will force us to re-invent the wheel over-and-over. Lysle taught us all to be skeptical, he asked us to think, and when something sounds too good to be true, it probably is. Once during a dinner discussion, I said, "Doc, you're so smart." He turned and insisted, "NO! That's not it at all. I just take the time to think!" Any student of orthodontics should at least take their time to do a literature search and read his work. At the very least, his command of history, language, and the nuances of research, combined with his acerbic humor is irreplacable¹².

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Interviewers

Alexandre Moro

- Master in Orthodontics – UMESP;
- PhD in Orthodontics – FOB-USP;
- Full Professor at UFPR;
- Full Professor – Universidade Positivo – Dental School and Post-Grad;
- Associate Editor of the Ortho Science Journal.

Ernesto Rodrigues

- Specialist and Master in Orthodontics – CPO São Leopoldo Mandic;
- PhD student in Orthodontics – CPO São Leopoldo Mandic;
- Professor of Occlusion and Orthodontics – Unifamines;
- Specialization Coordinator in Orthodontics – São Leopoldo Mandic Belo Horizonte.

Mauricio Accorsi

- Residency in Orthodontics and Facial Orthopedics – UFPR;
- Preceptor in Orofacial Pain and Dysfunction – University of California, Los Angeles;
- Master in Orthodontics – FOUSP;
- Visiting lecturer of the specialization course in Orthodontics – UFPR;
- Visiting lecturer of the master program for specialists – São Leopoldo Mandic (CAPES / MEC);
- Clinical director of the Cleartek® System (Aditek do Brasil);
- Editor of the Digital Dentistry in Science DDS-BR (Editora Plena).