



## Guest Editorial

# Are aligners our Faustian bargain?

Sridevi Padmanabhan  <sup>1</sup>\*

<sup>1</sup>Dept. of Orthodontics, Sri Ramachandra Institute of Higher Education and Research, Chennai, Tamil Nadu, India



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Orthodontists have always been progressive and open to embracing newer concepts and techniques. The orthodontic world was quick to switch to the preadjusted edgewise appliance when Lawrence Andrews introduced it in 1972 and nearly 50 years later, we are still using it with improvisations. The introduction of temporary anchorage devices enabled the orthodontist to expand the envelope of discrepancy three-dimensionally and treat malocclusions that previously mandated surgery.

The recent great revolution in Orthodontics is the introduction of Clear aligner technology (CAT) in the 1990's which provide an esthetic alternative to patients alongside other advantages. Predictably much of the orthodontic world was quick to embrace, endorse and propagate this revolution but with some important differences. Unlike previous inventions and innovations, the orthodontist was dependant on production houses that provided the technology to plan the treatment and print the aligners. For the first time, companies certified orthodontists and rather than questioning this shift of balance, it was even considered a matter of pride by some. It is debatable if similar parallels can be found in other specialities in the dental and medical world.

The relationship between the clinician and industry has always been recognized as a contentious one and this notion is not merely restricted to orthodontics.

\* Corresponding author.

E-mail address: [sridevipadmanabhan@sriramachandra.edu.in](mailto:sridevipadmanabhan@sriramachandra.edu.in) (S. Padmanabhan).

Productive relationships between industry and clinicians leads to novel devices of immense benefit to society and also provides resources for patient care, research and development. However professional organizations and centres of learning are wary of potential conflict of interests that may compromise core values of altruism and fiduciary relationships. Concerns have been voiced that industry might be defining our thinking.<sup>1,2</sup>

Even as emerging research evaluates the comparative efficacy of CAT vs conventional fixed appliances<sup>3-5</sup> and measures are on to improve the technology and technique, the narrative driven by marketing, consumerism and social media is vastly different. Have we been hasty in joining the chorus that extolls the virtues of this technique even though we are aware of its limitations? Concern has been expressed that with aligners, there is an increased willingness to compromise on treatment goals, adopt treatment strategies more within the realm of clinical effectiveness and relegate time tested fundamental principles of orthodontics to the background.<sup>6</sup> There is a learning curve with every new technique and the conscientious and innovative clinician improvises and draws on additional reinforcements like implants, expansion devices and sectional fixed appliances to improve treatment outcomes with CAT but has this been acknowledged and voiced enough?

The World Economic Forum has estimated that artificial intelligence will replace some 85 million jobs by 2025 and AI is a disruptive technology in many spheres. Disruptive technology is any innovation that dramatically changes

the way consumers, businesses and industries operate. When they're first developed, disruptive technologies can often create a new market or in other cases they can enter an established market and radically change the style of its operations. With AI driving treatment planning and production of aligners, the sacrosanct relationship between patient and doctor has been redefined by the aligner providers and the threat of direct to consumer(DTC) aligners has made it necessary for the orthodontist to reinstate his essentiality in this dynamic equation.

Several professional organizations across the world including the Indian Orthodontic Society have lost no time in issuing public awareness messages and launching campaigns to state that self administered and remote treatment cannot be justified from a professional medical perspective and thus represents a serious violation of ethical, medical and dental standards and is hazardous to patients.<sup>7,8</sup> Organizations are looking to regulatory bodies to overcome the menace of Do it yourself or DTC aligners. Still there is a market for "mail order" aligners and one of the most important reasons is that it is much cheaper.

Have we been over zealous in embracing and endorsing this new technology and has this led to our being the victims of a Faustian bargain? Or have we just been bystanders in the face of a rapidly progressing technology? Ray Kurzweil in his essay 'The law of accelerating returns' states that the history of technological change shows that the growth is exponential rather than linear. For instance, in the first twenty years of the twentieth century, we saw more advancement than in all of the nineteenth century. Now, paradigm shifts occur in only a few years time.<sup>9</sup> CAT is possibly a classical example of Kurzweil's observation.

On the other hand, there are others who opine that AI will not replace orthodontists but it will replace orthodontists who do not adopt AI. Softwares and Printers have become extremely affordable in recent times and the orthodontic profession probably needs to reinvent itself by investing in training and equipment which will allow production of aligners in house rather than depending on a third party that artificially inflates the cost of aligners.<sup>10</sup> Training programmes rather than eschewing CAT should include this in the curriculum and ensure that the current and next generation of orthodontists should focus not on killing

the dragon of AI but on taming it. Perhaps we can take comfort from the fact that AI cannot substitute for the social perceptiveness, empathy, original thinking, reasoning and cannot take up the moral responsibility that comes with being a health care professional /orthodontist.

**"Compassion: that's the one things no machine ever had"-Leonard McCoy in Star Trek.**


### Conflict of Interest

None.

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### Author biography

**Sridevi Padmanabhan**, Professor and Associate Dean (Research)  
 <https://orcid.org/0000-0002-0322-4136>

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