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Clear aligners in orthodontic practice are here to stay!

The fundamental building blocks of the burst of creativity in orthodontics has emerged with 3D intraoral scanning and printing. The virtual treatment planning was further harnessed with data from thousands of treated cases integrated for treatment planning through data analytics and artificial intelligence (AI). With extensive campaigns on braces-free treatment clear aligner industry plunged into business with heavy investments and aggressive promotions. Due to aggressive advertisement and social awareness, the demand for invisible orthodontics, more so among adults, has been fueled for two decades more so in the last few years. Therefore, upskilling with clear aligners has become unavoidable for an Orthodontist to keep his skills updated with this technology and ability to offer alternate options to traditional treatment modalities.

The clear aligner technical workflow involves 3d scanning and data acquisition, virtual treatment planning, printing model of each stage of treatment, and aligner fabrication through pressure thermoforming. The choice of material for transparent aligner sheets necessitates due strength and flexibility besides biocompatibility and stain resistance properties. Newer trends in development include shape-memory clear aligners. While first two steps, i.e. 3d scanning, data acquisition, virtual treatment planning, can be internalized in the dental office conveniently, and others can be outsourced to a third party to reduce the investment burden. Lately, some doctors have set up their in-house aligner laboratories. Compared to a custom commercial aligner's laboratory, the in-house process enables complete control of the treating orthodontist over the treatment plan and refinements for specific case's needs and alter treatment options during the course of treatment. This process accelerates aligner turnaround, increases profitability, and improves patient satisfaction. In house aligners also allow the doctor to use the technology in multiple case situations. Prosthetic rehabilitation of missing teeth can be made more durable by first restoring the health of the abutment teeth and re-establishing the occlusal equilibrium in pathologically migrated and mutilated dentition, thus improving the overall oral health-related quality of life.

As a tool, technology does not threaten society, and its misuse threatens society. The use of aligners is only a part of the treatment process, and fundamentals of facial growth, biology, muscle behavior, and functions of stomatognathic systems need to be integrated with treatment planning. While the use of clear aligners may appear simple, the complex and major tooth movements necessitate deep thinking and planning to integrate biomechanical and biological principles of tooth movement with the addition of attachments. Some of the research through finite element analysis (FEM) could help us is suggesting the precise location and shape of the attachment on each tooth. This science is still under refinement. The evidence-based clinical research with this technology can help explore its predictable potential for treating complex malocclusions. The aligners are here to stay, and we, as orthodontists, will need to rationalise their use and continue to refine the process for the quality outcome and patient comfort.

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