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Benefits and Advanced Procedure of Orthodontics

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Opinion Article

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DESCRIPTION

The study looked into which patient and orthodontic treatment factors are predictors of continued treatment in a dental clinic of an Orthodontics specialisation programme. Orthodontics is typically one of the most elective fields of oral therapy. However, when considering the significant impact that a beautiful smile with normally aligned teeth can have on personality development, as well as the increased self-esteem that this health service develops, it becomes less elective. Orthodontic therapy, which is typically provided by orthodontic specialists, is widely available at a reasonable cost and without many risks or complications. It should be carried out as necessary to enhance the patient's self-esteem, the aspect of their grin, and how well their chewing system works.

Orthodontics is one of the fields of dentistry that has benefited from advances in 3D printing, allowing for the transition to a fully digital workflow through the use of intraoral scanners and 3D printers. Theoretical growth models can be applied to tissues using a face scan, CT scan, and software programmes to predict the changes that will occur during growth and after orthodontic treatment. 3D printing allows for the presentation and visualisation of these changes, assisting orthodontists in anticipating biological responses after the application of orthodontic forces and patients in visualising the final outcomes of orthodontic treatment.

3D printing has also been used to create orthodontic models, aligners, and appliances. SLA (Sand blast, Large grit, Acid-etch) has been used to create 3D orthodontic models from digital files, the accuracy of which is determined by the print layer height and the 3D printer. PJ (Poly Jet) has also been used to create orthodontic models, with very different post processing phases than SLA. The presence of a washing station is required for the removal of the model's gelatinous support material after printing with PJ, whereas SLA requires the application of an alcohol wash followed by exposure to ultraviolet light for complete curing.

Despite providing more detail and an improved surface finish, the smaller (25 mm) layer height printed models had the highest deviations, while the larger (100 mm) layer height printed models had the lowest deviations, all of

which were within clinically acceptable limits. Orthodontics appliances can be manufactured directly or indirectly using 3D printing. A comparison of orthodontic appliances produced using 3D printing (PJ) versus milling revealed that milled appliances had better fitting accuracy and resulted in faster tooth movement with more uniform stress distribution.

When 3D printing orthodontic aligners, several factors should be considered to allow for better control of tooth movement, such as lower layer thickness (staircase effect) and higher accuracy. Multicomponent orthodontic appliances have also been created using 3D printing, with good clinical fit, while metal springs and clasps were created using a bending robot. Custom brackets for lingual orthodontics have also been created using 3D printing (in wax analogue followed by casting in high gold content alloy), reducing patient discomfort, debonding incidents, and problematic finishing that are common when using lingual brackets. These programmes pave the way for the future of orthodontic treatment through a digital workflow, even though some have just been published in a small number of instances as "proof of concept."