Journal of Healthcare Engineering

Special Issue on

Polymers in Contemporary Orthodontics: Beginning the Revolution

CALL FOR PAPERS

In recent years, biocompatible polymers gradually gained interest in the orthodontic field. From thermoplastics to 3D printable polymers, orthodontic appliances are being revolutionized by new materials, which in turn gave birth to new device categories.

Analyzing the latest orthodontic developments, clear plastic aligners were proposed as the best solution to patients' complaints about esthetics and comfort. However, recent scientific literature demonstrated that aligners not only are more esthetic and patient friendly, but also may present advantages compared to other traditional appliances in terms of treatment efficiency and biological response to appliance wearing.

Apart from the biochemical processes during bone remodeling, the biomechanics of tooth movement is an important topic in orthodontic research. One of the particular interests to orthodontists in this field of engineering is the calculation of stress developed on the tooth and surrounding tissues during orthodontic tooth movement. Other studies have focused on investigating the stress within the periodontal ligament (PDL) induced by orthodontic forces.

The finite element (FE) method is used to understand the biomechanics of orthodontic devices because it allows the estimation of stress, strain, and deformation in different tissue structures, such as alveolar bone, periodontal ligament (PDL), and teeth during treatment. Several studies have employed FE on orthodontic mechanics. However, there are very few studies in which FE analysis was applied to the mechanics of aligner orthodontics.

Furthermore, there are very few studies in which the mechanical properties of polymers used to create aligners are analyzed and discussed.

The aim of this special issue is to further investigate the state of the art of polymer application in aligner orthodontics and to obtain clinical and in vitro studies representing the best available evidence regarding aligner orthodontics. Original research articles and review papers are also welcome.

Potential topics include but are not limited to the following:

- FE analysis of biomechanical models of aligner orthodontics
- Mechanical properties of polymers applied in aligner orthodontics
- 3D printable polymers for customized appliances
- Memory-shape material application in orthodontics

Authors can submit their manuscripts through the Manuscript Tracking System at https://mts.hindawi.com/submit/journals/jhe/prcob/.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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