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Miss. Magdalena Kwiatkowska

Magdalena Kwiatkowska¹, Aneta Kamińska², Justyna Batkowska³, Anna Szabelska⁴

¹-Magdalena Kwiatkowska, Doctoral School of the Medical University of Lublin, Department of Dental Techniques with The Lab of modern Techniques Medical University of Lublin, Poland

²-Aneta Kamińska, Department of Dental Techniques with The Lab of modern Techniques Medical University of Lublin, Poland

³-Justyna Batkowska, Institute of Biological Basis of Animal Production Faculty of Animal Sciences and Bioeconomy University of Life Sciences in Lublin, Poland

⁴-Anna Szabelska, Department of Dental Techniques with The Lab of modern Techniques Medical University of Lublin, Poland

The evaluation of flexural strength of thermocycler stereolithography photopolymer methacrylate resin materials.

Three-dimensional (3D) printing technologies are advanced manufacturing technologies based on computer-aided design digital models to create personalized 3D objects automatically. It has led to the development of new classes of materials and to the digitization and automation of various work processes. Three-dimensional printing so many advantages in process engineering, with applications in dentistry ranging from the field of prosthodontics, oral and maxillofacial surgery, and dental implantology to orthodontics, and periodontology.

The purpose of the study was to analyze the mechanical properties of a photopolymer dental resin under thermocycling fatigue. The study analyzed the flexural strength and impact strength of two dental resins used in prosthetic treatment. The study used 2 types of resins: for temporary restoration and resin designed for long-term use.

After the fatigue tests, statistical analysis was performed and parametric tests and IBM SPSS Statistics software were used.

Parametric analysis showed a significant effect of time on relative strain ($p \leq 0.05$) and a correlation between elastic modulus and thermocycles ($p \leq 0.01$). A correlation was also observed between flexural strength and relative strain ($p \leq 0.01$) between resins for temporary and long-term restorations.

Long-term resins, due to their better strength properties, should be used for both permanent and temporary work. At the same time, due to the higher values of destructive forces recorded for long-time resins. it is reasonable to use these materials in temporary work with patients who generate significant values of chewing forces.

Keywords: Stereolithographic fabrication, 3D printing, biopolymers, methacrylate resin

Biography:

Miss. Magdalena Kwiatkowska, Certified Dental Technician with 5 years of experience and a track record of maintaining the highest standards in creating oral appliances. I study the properties of modern materials in the fields of stomatology and dental technology. I have been teaching at the medical school as a lecturer in the field of dental technology and medical sterilization for 5 years. I try to transfer my passion for virtual technologies to the world of modern dentistry. Professionally and privately for many years associated with the medical industry.