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Evaluation of the mechanical and microstructural characteristics of oral structures

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Resumo:

The healing of edentulous upper and lower mandibles with the use of oral implants and metal infrastructures is a common practice although also are not uncommon the fracture of the infrastructures. The alloy used for the structure has the well-known cobalt chrome molybdenum composition, molded during solidification, as a classical practice. This paper aims to evaluate the solidification of the alloy in two different cooling rates to evaluate the microstructural dependence of the mechanical resistance to the solidification parameters. Also, oral structures were connected to oral implants installed in artificial mandibles and then artificially loaded on a special device. The mandible, implant, and infrastructure system were then mechanically and vertically loaded allowing the evaluation of the surface strains on the infrastructure on the mandible using Digital Image Correlation (DIC). Results strongly suggest the strains' dependence on the structure's cross-section and non-symmetrical strain on the mandible surface around the implant.