

# 2<sup>nd</sup> European Conference on Dentistry and Oral Health

April 16, 2025 | Paris, France

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### Risk of Fracture of Narrow Implant Components in Single Prosthesis of Maxillary Premolars: Study with Finite Elements

#### Abstract:

There are doubts about the useful life and risk of fracture of prosthetic components of small diameter implants, particularly in regions of greater masticatory effort. The present study evaluated the risk of fracture of single prostheses of maxillary premolars restored with Morse cone implants measuring 2.9 mm and 3.5 mm in diameter, with different bone loss profiles. To this end, a tomography model was edited to represent six models with different implants and bone crest thicknesses, including a model with vestibular fenestration. These were subjected to simulations in two steps, the first being the clamping pre-tension of the intermediary and the second a masticatory load of 120 N or 240 N, resulting in twelve different simulations. The results were compared to the strength of the materials to estimate the fatigue life of each component. These demonstrated that the models with 3.5 mm implants had a medium to long useful life expectancy, depending on the simulated masticatory load, while the models with 2.9 mm implants had a long useful life expectancy at a load of 120 N, but Short term structural failure for 240 N load.

#### Biography

**Rogerio Mengarda** is a renowned dental surgeon and the Clinical Director at OdontoMengarda in Porto Alegre, Brazil. With over 20 years dedicated to dentistry, he specializes in dental implants and aesthetic dentistry. Dr. Mengarda holds a doctorate in clinical dentistry and an MBA in Clinic and Hospital Management. He is a Harvard OPM graduate and a recognized expert in guided surgery and digital smile design, having transformed over 15,000 smiles. His clinic is known for its state-of-the-art technology and adherence to international quality standards.