A comparative study of the behavior/stress distribution (tensional forces) around short and standard length implants on the posterior area of the maxilla. Finite element analysis.

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Current studies conclude that the maximum tension and the greater distribution of forces would occur around the implant neck endorsing the use of short implants.

Objectives: Compare the distribution of tensions between a short dental implant osseointegratted osseous availabilities in different vertical and standard osseointegratted implants in the posterior maxilla in mixed terrain. Know the stress distribution of each of the biological models created for this study. Study whether the increased diameter of the short implant favorably affect the comparative distribution of stress. Analyze whether the result obtained in different biological models created with the proponed variables support the use of short dental implants.

The method used was the Finite Elements Method (MEF), which allows to solve differential equations associated to a physics problems about complicated geometries.

Results: The locations of the maximum values of Mises are concentrated in the cervical portion of the implant. Tensions in the implant in all models are in the same range. Also, is observed that the higher the modulus of elasticity of the elements of the models, the greater the absorption of forces by them. Stress in cortical bone in the models showed no significant differences, but in the model where the diameter of the implant is increased to 4.8, a marked decrease occurs in the bone stress. The comparison of the stresses in the cancellous bone shows that there is difference in the stresses produced in the bone with Bio-Oss®. The Bio-Oss® bone replacement is located in the apical portion of the implant is therefore far from the area of greatest concentration of effort.

Conclusion: The maximum concentration of force is in the cervical portion of the implant, son this location is independent of the length of the implant. It is more important and favorable to increase the diameter of the implant than its length.

Query the application of previous surgery techniques in order to modify the way of use of standard dental implants, from the biomechanical point of view, the regenerated bone does not support forces, because it’s scarce mechanical resistance, and remoteness from the site of higher force concentration.

Placement of short implants in soft bone seems possible, but we recommend further research to reach more firm conclusions.

Al lasts, the criterion of implant choice to the various situations of field implantation depends on operator judgment (learning curve).

Keys words: short implants, MEF, maxillary posterior