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Thesis Title	**Comparison of Some Mechanical Properties Concerning the Mold of Tooth and/or Implant Supported Overdenture**			
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Abstract	**ABSTRACT** Previously, the choice of prosthetic implant retained overdenture has depended on data from previous studies about the retention fatigue strength of the attachment system selected and stress distribution and flexing occurred at the bone surrounding the overdenture support foundations. Little or no data have been available on the correlation between the attachment system selected and the overdenture support configuration in relation to the previously mentioned parameters. The purpose of the study is to evaluate the retention fatigue strength, stress distributions and alveolar bone flexing of different attachment systems and support designs of overdenture prosthesis. Twelve models were included in the study; six main models (A,B,C,D,E and F) were selected according to the support designs of overdenture prosthesis, each model was further divided according to the attachment combinations into model 1; Dalbo elliptic and/or O-ring attachments only and model 2; with flexible acrylic attachments. Model A contained three overdenture supports: two free standing mini dental			

	implants in the canine region and at the midline, and one simulated tooth root with dalbo rotex screwed in. Model B contained four overdenture support foundations: two free standing mini dental implants in the right canine region and the first premolar region, and two simulated tooth roots with dalbo rotex screwed in, at the same mini dental implant position, but on the left side of the model. Model C contained three overdenture support foundations: two free standing mini dental implants in the canine region and at the midline, and one simulated tooth root with mini dental implant screwed in. Model D contained four overdenture support foundations: two free standing mini dental implants in the right canine region and the first premolar region, and two simulated tooth roots with mini dental implants screwed in, at the same mini dental implant position, but on the left side of the model. Model E contained three free standing mini dental implants one at the midline and two bilaterally located at the canine regions. Model F contained four free standing mini dental implants bilaterally located at the canine and first premolar regions. Retention force measured only for models A,B,C and D, five samples were prepared for each model and retention force values (N) were recorded initially (0 cycles) and after 360, 720, 1440 and 2880 insertion and removal cycles. Stress distributions and flexing were evaluated after applying 35 N vertical load and 17.5 N lateral load under static conditions to simulate the occlusal forces following the concept of lingualized occlusion, all conditions were set using the finite element program ANSYS v 13.0, maximum von-Mises stress and flexing at the level of the attachments and at the bone support foundation interfaces were compared in all models. Values of absolute force and relative force were statistically analyzed by two-way ANOVA and multiple comparisons Tukey’s tests

	between models and cycles periods. The results of retention fatigue strength tests show a 50% reduction in retention force in the models with flexible acrylic attachments. A triangular design of overdenture support foundations with O-ring attachments revealed the lowest value of absolute force and a relatively high reduction in relative force. Stress and flexing on all models was analyzed after loading condition; free standing triangular design of mini dental implants and flexible acrylic attachments model revealed the lowest von-Mises stress and flexing in relative comparison to other models. The conclusion drawn from this study stated that four overdenture support designs with flexible acrylic attachments improved the retention force and reduced the fatigue retention and flexible acrylic attachments offer a wide range of retention forces. Furthermore, free standing mini dental implants with flexible acrylic attachment systems supporting overdenture reduced stresses and flexing in the supporting alveolar bone.