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"EVALUATION OF STRESS AROUND THE IMPLANTS IN THE ALL ON FOUR CONCEPT COMPARING TILTED AND PARALLEL DISTAL IMPLANT PLACEMENT IN THE MANDIBLE-A PHOTOELASTIC STUDY."

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ABSTRACT

Background: The rehabilitation of atrophied edentulous mandible in the posterior region with implants causes trouble to the practioner mainly due to in availability of adequate bone and presence of anatomic structures such as the mandibular canal.

This led to the development of All on four concept. A lot has been told and discussed about the implant angulations in the All on four concept but there is a still a controversy regarding the angulations of the distal implants. Thus the purpose of this photoelastic study is to evaluate stress around each implants comparing two different designs one in which the implants are placed parallel to each other and in the other the distal implant is placed at an angulation of 25 degrees.

Objective: The objectives of this study were to evaluate the stress around two distally tilted placed in accordance with the All on four concept and to evaluate the stress around the four implants placed parallel to each other.

Methodology: Two Photoelastic models of epoxy resin each with four implants simulating All on four concept was made. The two anterior implants were placed in the approximate lateral incisor position vertical and parallel to each other. The distal implants in one model were placed parallel to the anterior implants. In the second model the distal implants were placed at an angulation of 25 degrees. Each model was subjected to a load of 10kg, 15kgs and 30 kgs bilaterally. The Photoelastic analysis was accomplished using a circular polariscope and the fringe patterns produced for each implant assembly was photographed using a digital camera.

Results: The fringe patterns increased in number and proximity for the model with distally tilted implants as compared to the model with parallel implants.

Conclusion: Within the limitations of this study the following conclusions were drawn that there was increased stress concentration seen around the distal tilted implants on application of the load as compared to axially placed distal implants under both loading conditions.

Keywords: All on four concept, circular polariscope, photoelastic analysis.