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KEY WORD : STRESS DISTRIBUTION/BURSTONE INTRUSIVE ARCH/RICKETTS UTILITY ARCH/ PHOTOELASICITY

RACHADAPORN SRIMANON : A COMPARATIVE STUDY OF STRESS DISTRIBUTION DUE TO MANDIBULAR INCISOR INTRUSION BETWEEN BURSTONE INTRUSIVE ARCH AND RICKETTS UTILITY ARCH BY PHOTOELASTIC TECHNIQUE. THESIS ADVISOR : ASSO PROF.SMORNTREE VITEPORN,184 PP.ISBN 974-581-675-2

The objectives of the study were to scrutinize stress distribution fol -lowing the intrusion of mandibular incisors by 2 mechanics : Burstone intru--sive arch,Ricketts utility arch ;and to compare the different of stress pattern created by the 2 mechanics.

The experiment was undertaken on a birefringent model which represente the mandibular arch with excessive curve of spee.The four incisors were intrud -ed by 0.018" x 0.022" Burstone intrusive arch and 0.016" x 0.016" Ricketts utility arch,respectively.The stress distribution in the aforementioned model was evaluated by the Photoelastic technique.

The results were as follows :

1 With the appropriate force magnitude as recommended by each techniqu (50 gram forces for Burstone intrusive arch,75 gram forces for Ricketts utilit arch) :

1.1 Burstone intrusive arch created the stress which distributed around the apices of the four incisors and extended upward around 1/3-2/3 of the root length.At the posterior teeth the stress distributed around the apice of all the posterior teeth and at the interradicular areas.Variations of the stress distribution at the left and right posterior teeth could be found at the cervical area between the first molar and the second premolar.

1.2 Ricketts utility arch created nonhomogeneous stress distribution Maximum stress could be found at the mesial aspect of the right lateral inciso At the other areas the stress distributed around the apex of the other three incisors.At the cervical area of these teeth the stress was also found around 2/3 of the root length.At the posterior teeth the distribution of stress was varied.At the left side the stress was found at the cervical area,and the me--sial aspect of the first molar.This stress extended toward the distal surface of the second premolar.On the right side the stress extended not only from the apical area of the first molar to the first premolar but also from the cervica area between the two bicuspids.

2 At the same force magnitude the two mechanics created the different stress pattern in both anterior and posterior teeth.

At the anterior teeth,Burstone intrusive arch with 50 gram forces created the stress around 2/3 of the incisal root.When the force was increased the stress distributed into two directions : cervical and radicular areas. Meanwhile Ricketts utility arch with the same force magnitude created the stress at both radicular and cervical areas. When the force was increased the stress pattern was rather the same.

At the posterior teeth Burstone intrusive arch produced the stress which distributed around the apex of all the posterior teeth meanwhile Rickett utility arch produced major effect on the first molar.