

Mouthguard Design of Anterior Palatal Part and Shock Absorbing Capability

Junko Yamada *, Hajime Satoh Yoshinobu Maeda, Jiro Miura
(Osaka Univeristy)

Purpose:

The purpose of this study was to evaluate the influence of mouthguard anterior palatal margin location on the shock absorbing capability.

Materials and methods:

Simulation study was conducted on the maxillary phantom model (Nissin Co. Japan) with maxillary teeth, bone, and soft tissue. Single layer (3.8 mm thick) mouthguard samples were fabricated with ethylene vinyl acetate sheets (Erko-soft, Erkodent, Germany) by the pressure-forming machine (Erkopress ES-200E, Erkodent, Germany) on the duplicated plaster model.

Location of anterior palatal mouthguard margin (4, 3 and 2 mm in thickness) was set at 4, 2 and 0 mm from the cervical margin in above three experimental configurations. Control was without mouthguard situation.

Five N of calibrated shock was applied at the middle portion of the labial surface of central incisor.

The amount and direction of tooth deflection were evaluated by the data obtained from strain gauges attached on the tooth and the bone surface. Obtained data were analyzed with the multiple regression analysis.

Results:

Results indicated that the thickness rather than the location of anterior palatal margin of mouthguard has significant influence on the reduction of teeth deflection during traumatic event.

Conclusion:

Within the limitation of our model study, we concluded that we could shorten the palatal margin of mouthguard till the cervical area so far as we keep its thickness to maintain its rigidity.