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Evaluation of the vertical forces generated by the cervical biteplate facebow

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ABSTRACT

The biteplate facebow has been recommended for use in the correction of Class II malocclusions with deep overbites. This facebow is similar in design to the conventional cervical facebow with the addition of an inner bow metal plate. The plate presses against the maxillary incisors and prevents the patient from fully closing, thus acting as a biteplate. A test apparatus was constructed to simulate the force system present during application of the facebow. In this study, high resolution force transducers were used to measure the intrusive forces on the maxillary and mandibular incisors. Static force analysis techniques were then used to calculate the vertical force component of the first molars. Analyses were performed using a wide range of relative bow angles, neck strap tensions of 200 grams and 400 grams, and various mandibular incisor occluding forces. The molar eruptive forces of the biteplate facebow are found to exceed those of the standard cervical facebow by a low of 158% to a high of 537%, depending on the neck strap tension and the inner bow/outer bow angle. While the intrusive forces on the maxillary incisors were excessive, no intrusion is anticipated because the biteplate disarticulates the posterior teeth and the eruption of the unopposed maxillary molars would likely cause the occlusal plane to tip in a counter-clockwise direction. Consequently, the overbite correction would be obtained through maxillary molar eruption accompanied by occlusal plane tipping. Before considering use of the biteplate facebow, a patient's anticipated growth pattern, the magnitude of the intrusive forces and the treatment objectives should be evaluated.

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