

**Influence of different orientations and rates
of bidirectional distraction osteogenesis of the
mandibular corpus: a three-dimensional study.**

Abstract

Objective: The objective of this study was to evaluate the biomechanical effect of mandibular corpus distraction osteogenesis with different orientations and rates. **Materials and Methods:** A three-dimensional model of the mandible was created. The vertical surgical cut was made, the force was applied horizontally in a bidirectional manner within two orientations: parallel to the occlusal plane and parallel to the inferior border of the mandible with three rates (0.5mm, 1mm and 1.5mm). **Results:** The maximum values for von Mises stress when the force was applied parallel to the inferior border of the mandible with all three rates were smaller than those with force direction parallel to the occlusal plane. The displacement in all three directions x, y, and z were not parallel and prominent in the anterior part of the mandible, while the movement at the posterior part is negligible, x and z displacement were bigger when force was applied parallel to the inferior border of the mandible, z displacement was more prominent than x and y displacement, both directions produced upward rotation of the mandible, this rotation was more noticeable when the force was applied parallel to the inferior border of the mandible. **Conclusions:** A vertical cut can be used in the patient with a long anterior face. This site of distraction achieves more lengthening of mandible than expansion.