

Could rhombic shaped miniplates be applicable for subcondylar fractures of mandible?: A biomechanical study

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Abstract

Purpose: Fractures of the mandibular condylar process are the most common fractures in the maxillofacial region. Surgical treatment of condylar region fractures with miniplates and miniscrews has become quite popular because it is a stable method and allows for immediate function. The present study examined sheep hemimandibular subcondylar fracture models to evaluate the biomechanical properties of two miniplate/screw system types, which are used to surgical fixation of subcondylar fractures. **Experimental:** The experimental standardized subcondylar fracture lines were examined in ten sheep hemimandibula models. Each segment was fixated with one of two fixation types: double straight miniplates with eight miniscrews or single, one rhombic-shaped miniplate with five miniscrews. All models were mounted in a servohydraulic testing unit, and continuous linear force was loaded. The maximum force and displacement values were compared and analyzed statistically. **Results:** The rhombic miniplate group had statistically significantly lower values than the double straight miniplate group for maximum force, work at maximum load, and hardness. There was no statistically significant difference between the two groups in terms of displacement at maximum load. **Conclusion:** Considering the advantages of rhombic shaped miniplates, they are suggested as a clinically reliable treatment alternative for the surgical fixation of subcondylar fractures.

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