

[Skip to main content](#)

Evaluation of the rigidity of sagittal split ramus osteotomy fixation using four designs of biodegradable and titanium plates—a numerical study

??? ??????: 08 ?????/???? 2017

Abstract

Purpose

This study was conducted to determine the best design of biodegradable plates for providing rigidity when used for fixation of sagittal split ramus osteotomy.

Methods

A computerized tomography image of a patient was used to generate a 3D model of a hemi-mandible. Four plate designs were merged with the hemi-mandible. They were (1) straight plate, (2) double straight plate, (3) T-shaped plate, and (4) double Y-shaped plate. Four finite element models were analyzed using the properties of biodegradable materials for the plates, and four additional models were analyzed using titanium alloy properties.

Results

The models predicted that rigidity of fixation would be noticeably less among biodegradable plates than titanium plates. They also predicted that the most rigid design among the titanium plates would be the straight plate, but among the biodegradable plates, it would be the double Y-shaped plate.

Conclusion

The double Y-shaped design is recommended when using biodegradable plates in fixation of sagittal split ramus osteotomy.

Keywords

Sagittal split ramus osteotomy Biodegradable Titanium Rigid internal fixation Finite element analysis

Journal: [Oral](#)

[and Maxillofacial Surgery](#) Volume 19, Issue 3 , pp 281-285

DOI: 10.1007/s10006-015-0491-8

Print ISSN : 1865-1550

Online ISSN : 1865-1569

Publisher : Springer Berlin Heidelberg