

TOWARDS THE DEVELOPMENT OF A COMBINED RIGID BODY – FINITE ELEMENT MODEL FOR THE INVESTIGATION OF TEMPOROMANDIBULAR JOINT LOADS

Benedikt Sagl⁽¹⁾, Eva Piehslinger⁽¹⁾, Michael Kundi⁽¹⁾, Martina Schmid-Schwap⁽¹⁾, Ian Stavness⁽²⁾

⁽¹⁾Medical University of Vienna, Austria

*benedikt.sagl@meduniwien.ac.at, eva.piehslinger@meduniwien.ac.at, michael.kundi@meduniwien.ac.at,
martina.schmid-schwap@meduniwien.ac.at*

⁽²⁾University of Saskatchewan, Canada

ian.stavness@usask.ca

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Summary: Temporomandibular joint disorders (TMD) are among the most prevalent human syndromes. Due to the complexity of the masticatory system, the development of TMD is not fully understood. Investigations of joint loads could lead to a better understanding of TMD. Hence, this project aims to use a novel biomechanical model of the masticatory region for the investigation of temporomandibular joint (TMJ) loads. CT data of a healthy person were acquired to create detailed models of the bony structures of the masticatory region. Additionally, MRI scans using a special TMJ imaging sequence were performed to acquire a high-resolution representation of the soft tissue structures of the TMJ for different static postures. The maxilla and mandible were represented as rigid bodies. The condylar and articular cartilage and the TMJ disc were represented as finite element (FEM) structures. In the future, we aim to use the combined Rigidbody/FEM model to gather insight into the mechanisms that underlie pathologies of the TMJ.