

3D-CT bei Gesichtsfrakturen, Vergleich von Volume und Surface Rendering

3D-CT of facial fractures Comparison of Surface and Volume Rendering

Thomas Rodt¹, Kaminsky J², Bartling S³, Zajaczek J⁴, Matthies H⁵
Becker H³, Zumkeller M¹

¹Abt. Neurochirurgie, Medizinische Hochschule Hannover

²Abt. Neurochirurgie, Universitätsklinik Tübingen

³Abt. Neuroradiologie, Medizinische Hochschule Hannover

⁴Abt. Radiologie, Medizinische Hochschule Hannover

⁵Abt. Medizinische Informatik, Medizinische Hochschule Hannover

Introduction

3D-CT of facial fractures has been reported to be beneficial using Surface and Volume Rendering. Controversial statements concerning the preferable algorithm have been made. The purpose of this study was to evaluate and compare Surface and Volume Rendering for clinical 3D-CT in patients with facial fractures on a clinical experimental basis.

Material and Methods

Helical multi-slice CT was obtained in 22 patients with facial fractures using two different data acquisition protocols. Five different Surface and Volume Rendering post-processing protocols were retrospectively applied using commercial software. Five observers assessed the quality of visualisation of the fracture gap and dislocated fragments as well as the overall image quality using a five-point rating scale. The potential benefit of the 3D-images for radiological diagnosis and presentation was evaluated. Furthermore the influence of the data acquisition protocol on the achieved evaluation values was analysed.

Results

3D-CT allowed spatial visualisation of the relevant anatomy and pathology in all cases. Surface Rendering in general achieved better evaluation values compared to Volume Rendering with corresponding thresholds. Variation of evaluation values for all criteria was found for Surface and Volume Rendering depending on the segmentation threshold. Apart from the overall image quality no significant influence of the data acquisition technique was found for the evaluated criteria.

Conclusion: Surface Rendering provided sufficient and time efficient means for 3D-visualisation of facial fractures in this study. No diagnostic benefit of Volume Rendering was found.