

Poliklinik für Zahnärztliche Prothetik

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Dental materials in MRI of the TMJ.

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Purpose: To evaluate the influence of dental alloys on MRI of the TMJ.

Methods and Materials: A model for the TMJ was developed to investigate the influence of several dental alloys at 1.5 T: 5 precious alloys, 7 non precious alloys, and 2 wires. Sagittal and transverse T1- and T2*-weighted FLASH images were measured additionally with 7 alloys. According to quantitative and visual evaluation of artifacts the alloys were subdivided into 4 categories.

Results: All Au-alloys (Herador H, Mainbond SG, Maingold A, Heraloy G) and the Ag-Pd alloy (Porson revealed no artifacts (category I). Minimal artifacts (category II) were caused by the Ni-Cr alloy (Wiron 99); the remaining nonprecious alloys (Biosil H, NP/2, NP/3, Wirocast, Wirolloy, Wirolloy E) induced artifacts up to 30 mm (category III). Severe artifacts larger than 30 mm (category IV) were found for the Ni-Cr and the 18/8 wires. Artifacts were more pronounced on T2*-weighted FLASH than on T1-weighted SE and FLASH images.

Conclusion: Generally, dental materials used for fixed prosthodontics do not influence diagnostic reliability of MRI of the TMJ; Ni-Cr or 18/8 wires used for orthodontic bands, however, can severely impair image quality - especially of the diagnostically relevant T2*-weighted FLASH images.