

Magnetic Resonance Imaging of Aesculap Implants

The implants of Aesculap are manufactured out of non ferromagnetic metallic materials like cobalt-chromium-alloys, titanium and titanium-alloys, and stainless steel. Further non metallic materials like ultra-high molecular weight polyethylene, polyether ether ketone, and alumina ceramic as well as mixed oxide ceramic are used.

As described in the literature most of the implants and materials evaluated in the MRI environment do not show an additional hazard under the test conditions chosen. A number of investigations [1-5] demonstrated the safety of implants up to a magnetic field of 3 Tesla. Image artefacts can compromise the quality of the examination.

However, in certain instances, due to the shape and length of singular implants, MRI-related heating due to resonance effects may be a problem (for example external fixation systems) [1,5]. Elongated implants with a dimension of about 25 cm at 1.5 Tesla and about 12 cm at 3 Tesla have been described as critical with regard to a possible heating [6].

We conducted several scientifically valid tests on the interaction of Aesculap implants with the magnetic field of MRI environment. The implants passed the criterion for magnetically induced displacement force, magnetically induced torque and RF induced heating under the specific test condition in the environment of a 1.5 Tesla and a 3 Tesla magnetic resonance tomograph.

Stainless steel used in some trauma devices may exhibit small magnetic interaction and heating in the MRI environment.

Although studies indicate that the MRI procedure up to a field strength of 3 Tesla has minimal effects on most implant devices, it should be moreover noted, that different types and generations of MRI equipment are applied. There are almost innumerable combinations of different implant components possible. Investigations of all combinations and different length of the implants are not available.

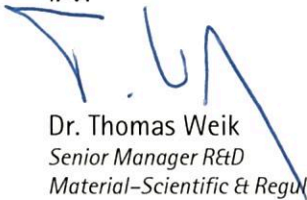
To date there are no incidents during the MRI investigation of patients with an Aesculap implant known. However a universally valid declaration regarding the interaction of Aesculap implants with any specific MRI unit under consideration of the individual setting applied cannot be made.

In principle it is recommended to reduce possible risks by using low field strength with low HF – energy and larger wave length. During imaging sequences with low specific absorption rate (SAR) have to be preferred.

Please contact us in case of questions.

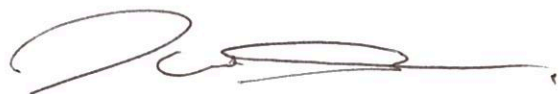
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