

EDITORIAL

Impact of magnetic resonance imaging on prosthodontic materials.

Magnetic resonance imaging (MRI) is a popular, non-invasive and highly advanced diagnostic aid which is recommended by both medical and dental practitioners to examine the region of head and neck. With the recent advancements in the field of dentistry most of the dental practitioners opt for orofacial rehabilitation using a wide variety of removable or fixed prostheses. Most of them are either metallic alloys or pure metal. Therefore, in order to avoid the ill effects of this state of art diagnostic aid on the prostheses and oral tissues we should have a sound knowledge about magnetic properties of these dental materials.

The ill effects of dental materials on MRI are categorized into mechanical, physical and artifacts. Due to very little quantity of material used, the first two have very little impact on our regular clinical practice. Artifacts occurring during MRI done in the head and neck region accounts to the lion's share of trouble shootings. Metal or metallic alloys are not the prime concern but their magnetic properties are. Metal can either have ferro-magnetic, para-magnetic or dia-magnetic properties. MRI works on the physics of magnetic fields and radiofrequency pulses. The properties of magnetic permeability and magnetic susceptibility determine which metal or metallic alloy will influence a magnetic field. **Diamagnetic** metals or alloys like gold, silver, platinum, palladium, zirconia show negative magnetic susceptibility and hence are immune to artifacts during an MRI. Several non-magnetic materials like composite resins, gutta-percha, glass ionomer cements are also diamagnetic in nature. **Paramagnetic** materials like dental amalgam, gold alloys, titanium alloys, has a marginally higher magnetic susceptibility and permeability. Therefore, they produce limited distortions which can be easily ignored or corrected. **Ferromagnetic** materials like stainless steel, nickel chromium alloys, cobalt chromium alloys on the other hand have higher magnetic susceptibility and permeability. Thus, they produce the artifacts which can jeopardize an MRI scan reading. Hence these materials need to be removed if an MRI is planned in the head and neck region.

Therefore, we must remember that it's not the metal but its magnetic property which matters when it comes to being compatible with MRI.



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