Magnetic Resonance Imaging

Frequently Asked Questions About Magnetic Resonance Imaging (MRI) in Patients with Spine Implants

1.) What are your potential risks with metal spine implants during MRI?

The effect of the strong magnetic fields on routine metal implants has historic concerns. Movement, displacement, and heating of stainless steel implants represent a potential hazard during MRI, especially if the implant material exhibits significant magnetism. The creation of magnetic field artifacts often make the images difficult to interpret by your spine surgeon.

2.) Is there a heating effect of spine implants during MRI?

Theoretical and experimental studies prove that implant heating induced by electrical currents from magnetic radio-frequency fields is almost not measurable in non-magnetic implants.

3.) Is there movement or loosening of spine implants during MRI?

Movement of spine implants represents only a "potential risk" during an MRI. The surgeons at the Center for Spinal Disorders use contemporary spine implants that are non-magnetic and, therefore, not subject to any forces in magnetic fields. On the other hand, significant ferromagnetism has been observed in aneurysm clips, hemostatic clips, biopsy needles, vascular clamps, dental implants, and heart valve prosthesis.

4.) How safe are spine implants with MR Imaging?

Contemporary spine implants are non-magnetic. MRI in this case does not pose any difficulties.

5.) How can the magnetic properties of implant materials be measured and compared?

The magnetic permeability and susceptibility are a measure for the magnetic properties of a material. The susceptibility determines how much a material is magnetized when it is placed in a magnetic field.

6.) What are imaging artifacts?

Metal implants are known to produce detection and resolution difficulties in MRI, so-called "artifacts." These artifacts may occur locally consisting of a focal loss of signal (black spot) at the site of the spine implant and in the surrounding metal-tissue interface.

7.) Is there a difference between MRI artifacts of stainless steel, pure titanium, and titanium alloys?

The amount of MRI artifacts is proportional to the magnetic susceptibility, and the size and mass of the spine implant. This explains why pure titanium and titanium implants produce less MRI artifacts when compared to ferromagnetic

stainless steel spine implants.

8.) How can the artifacts be reduced?

Imaging artifacts can be reduced but not prevented. Your surgeon's choice of spine implant material, imaging orientation, and imaging parameters at the MRI center can reduce image artifacts.

9.) What type of instruments can be used for surgical interventions within open MRI facilities?

All implants and instruments used in open MRI must also be made of non-ferromagnetic 'MR-safe' materials.

10.) Will the implants in my spine be detected at an airport security screening?

Most routine airport screening does not detect implantable spinal implants. The sensitivity of the screening machine, quantity of spine implants, and your body mass are important variables that determine the routine detection.

11.) Do I need antibiotics for routine dental procedures in the future?

No, but discussing this with your specific surgeon is advised.

If you have additional questions, please contact Ruth Beckham, ANP.