JOURNAL REVIEW

Magnetic resonance imaging and gynaecological devices

Correia L, Ramos AB, Machado AI, et al. *Contraception* 2012;**85**:538–543.

Magnetic resonance imaging (MRI) is now a widely available imaging modality and is increasingly the method of choice for examination of the female pelvic organs. As well as producing images that provide unrivalled differentiation of the pelvic organs, MRI has the added advantage of not exposing the patient to ionising radiation.

However, MRI is not suitable for all subjects. Implanted medical devices may be susceptible to overheating or dislocation by the magnetic field, or cause image distortion. This paper reviews the evidence for the safety of MRI in patients using gynaecological devices; namely intrauterine devices (IUDs), Implanon® and Essure®.

The authors start with a helpful summary of how MRI works. This allows the reader to understand the potential for harming a patient with

MRI and what factors may contribute to obtaining a suboptimal image.

They also provide a summary of the American Society for Testing and Materials (ASTM) classification system used for defining MR safety of devices. There are three categories: 'MR safe' (no risk at all in MR environments), 'MR conditional' (no risk under specific conditions) and 'MR unsafe' (MR is contraindicated).

The authors go on to review data from a number of papers on the application of MRI in women using the various gynaecological devices.

Four *in vitro* studies are summarised examining the risk of MRI in women using copper-containing IUDs. All of these conclude that MRI is safe and there is no significant distortion of image quality from artefact. However, a classification of 'MR conditional' is applied, the condition being a maximum of 3.0 T MR is used. The levonorgestrel-releasing intrauterine system has no metallic component and is classified as 'MR safe' by the ASTM.

The Essure system is a female sterilisation device consisting of metallic microimplants containing stainless steel, nickel and titanium. The implants are placed hysteroscopically in the isthmic portion of each Fallopian tube. Data

are presented from two studies by the same author on the use of MR at both 1.5 and 3.0 T. They conclude that MR is safe in women using Essure. However, again an ASTM classification of 'MR conditional' is applied. A maximum of 3.0 T MR should be used.

Finally, the authors examine the safety of MR in women using Implanon. This device is composed of plastic components only and is classified as 'MR safe'. It is identifiable on MR images and MRI may be considered a second-line imaging tool, after ultrasound, where it is not possible to clinically identify the implant.

In summary, the paper reports that MRI is safe in women with gynaecological devices and may be used with confidence in such patients.

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