In the IDEAL World

By Ben Kennedy, MRI specialist radiographer, Q scan Radiology Clinics

MR scanning around surgical implants is challenging, as the implant causes dephasing of the spins, which affects the image quality, particularly with fat suppression techniques. Fat suppression is commonly used post-surgery to rule out signal changes around the surgical site or to detect infection. However, standard fat suppression sequences suffer due to local field inhomogeneities. STIR imaging can be used in these cases, as the inversion pulse provides uniform fat suppression across the entire field of view (FOV), including around the surgical site. However, STIR images cannot be used post contrast.

Our facility recently installed a Signa® HDxt 1.5T MR and began using IDEAL, a GE Healthcare exclusive fat and water separation MR imaging technique. IDEAL has demonstrated robust image quality in areas where traditional sequences struggled, IDEAL has improved the diagnostic quality of our images in patients that traditionally proved to be a challenge.

The uniform fat suppression obtained with the IDEAL sequence enables us to acquire robust, repeatable results every time, which translates to a reduction in repeat scans. We also believe IDEAL will make a large impact in imaging oncology patients. Areas such as the skull base and nasopharynx can be scanned using IDEAL to ensure uniform fat suppression in any contrast weighting.

In consultation with our Neuroradiologists, Dr. Hal Rice and Dr. James Fitzgerald, the imaging results at our facility with IDEAL and CUBE (3D isotropic imaging technique) have been extremely useful in helping to achieve excellent image quality as compared to standard sequences.

Clinical case

Patient presented for an MRI post surgery. An IDEAL T1 sequence post contrast demonstrated a collection posterior to the spinal canal. As demonstrated in the images below we have uniform fat suppression around the region of the surgical implants as well as a large reduction in artifact around the surgical site. The clinical impact of these images is tremendous; our radiologist can diagnose the underlying pathologies with greater confidence, leading to better patient care results. ■

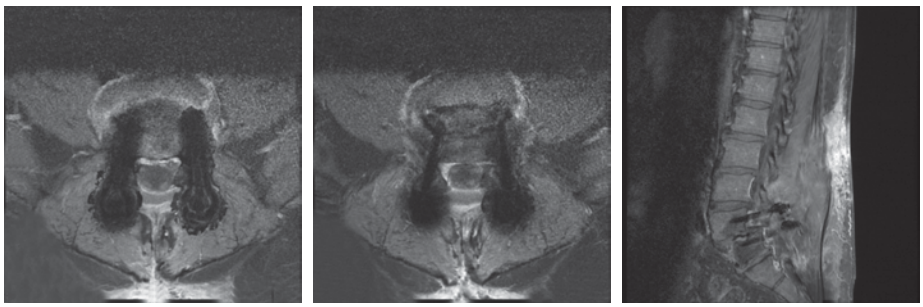


Figure 1. T1 IDEAL, post-contrast study depicts the collection posteriorly. IDEAL provides uniform fat suppression and significantly reduces any artifact caused by surgical implants.

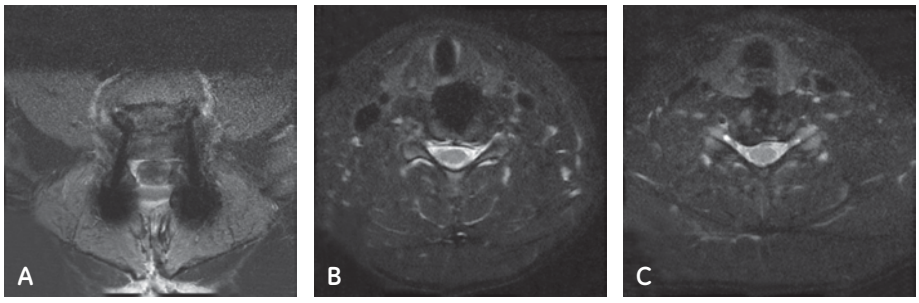


Figure 2. (A) T2 IDEAL scan with surgical implants in situ. Note the superb fat suppression across the entire FOV as well as in the axial plane which depicts the exit foramina despite the surgical implants. (B, C) Axial T2 IDEAL of the cervical spine; surgical implant in situ has minimal effect on image quality, note the homogenous fat suppression at the surgical site and across the entire FOV.

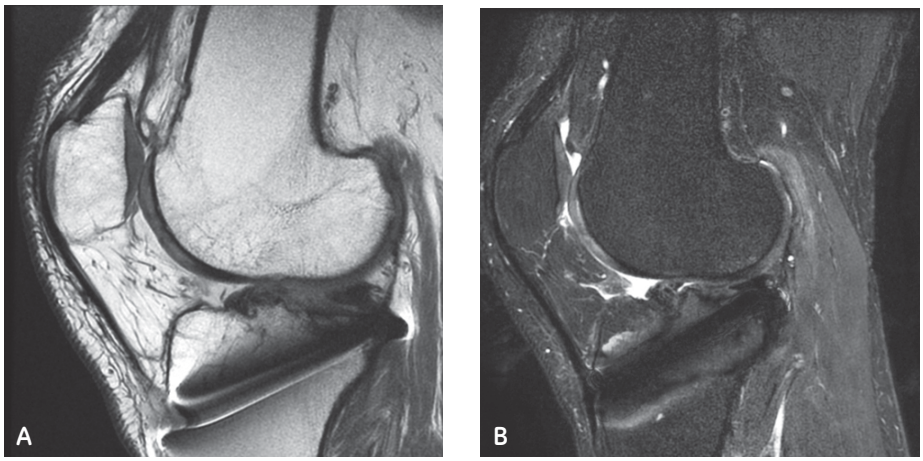
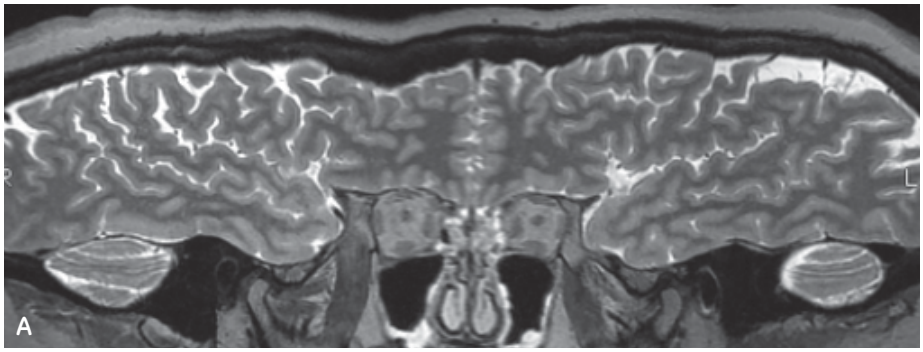


Figure 3. (A) IDEAL image of the knee, non fat suppressed data set; (B) Note how IDEAL reduces the susceptibility effects around the site of the metallic implant.



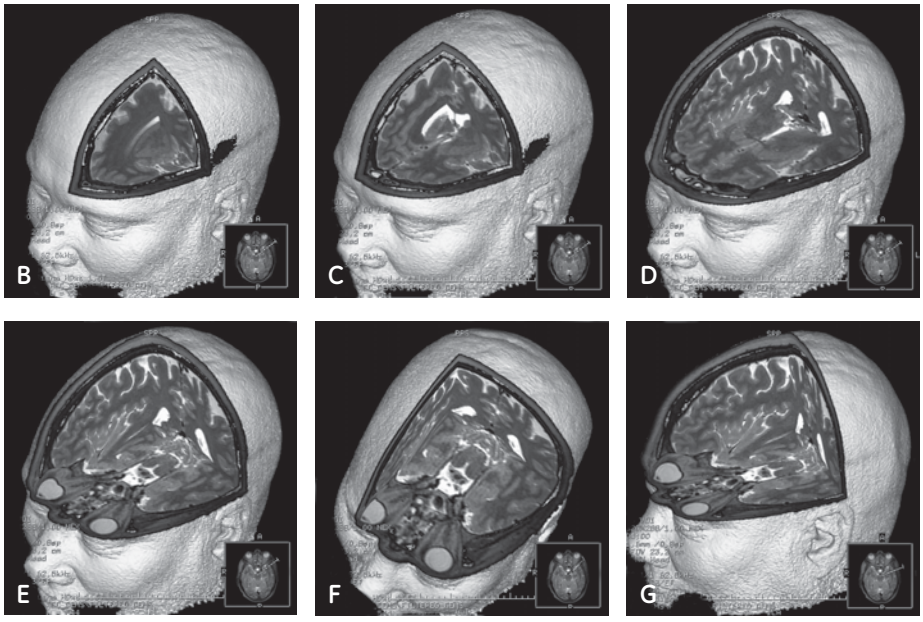


Figure 4. Cube has been incorporated into our neuro imaging routine and we have started to expand its use in the spine to aid in the depiction of the exiting nerve roots through the neural foramina.

Ben Kennedy

Ben Kennedy, an MRI specialist radiographer for Q scan Radiology Clinics, holds a Postgraduate Masters Degree in MRI from the University of Queensland (Australia). He has a broad experience in advanced MRI techniques and has managed MRI research in a diverse range of clinical areas. Kennedy has been an invited speaker in subjects including musculoskeletal and neurological MRI and physics for the Australian Institute of Radiography and the Queensland Radiology training program.

About the facility

Q scan is a world-class, fully independent radiologist owned and operated diagnostic medical imaging practice committed to delivering excellent service to referring clinicians and patients.

Q scan radiologists are locally trained and are leaders in their specialist field. Q scan utilizes the most technologically advanced equipment available in a comprehensive multimodality practice to provide a fast, reliable, and accurate service.