

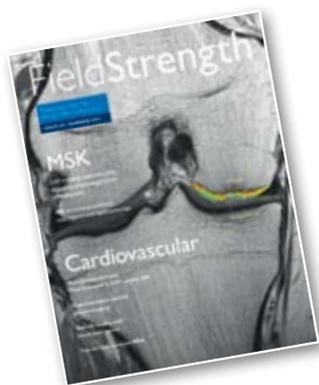
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Achieva 3.0T helping to keep the sporting elite in the game

3.0T imaging at Olympic Park, Melbourne,
supports early diagnosis of sporting injuries



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David Connell, MD, radiologist,
Clinical Director of I@OP.

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[Imaging @ Olympic Park](#) (I@OP) is a private imaging and treatment center located in Melbourne's AAMI Park, an iconic new sports venue that's home to some of the city's National League soccer, rugby and Australian Rules football teams. The center claims to offer the sporting and wider community access to some of the best imaging equipment in the world including a [Philips Achieva 3.0T X-series](#).

Achieva 3.0T helping to keep the sporting elite in the game

3.0T imaging at Olympic Park, Melbourne, supports early diagnosis of sporting injuries

“We predominantly see professional sports people but our patients also include people of all ages and walks of life with an interest in sport,” says radiologist David Connell, MD, Clinical Director of I@OP. “Although many of these come to us with sporting injuries, nowadays the focus of our work is increasingly on visualizing potential injuries before symptoms become apparent, and for this we find MRI, with its absence of ionizing radiation, particularly valuable.”

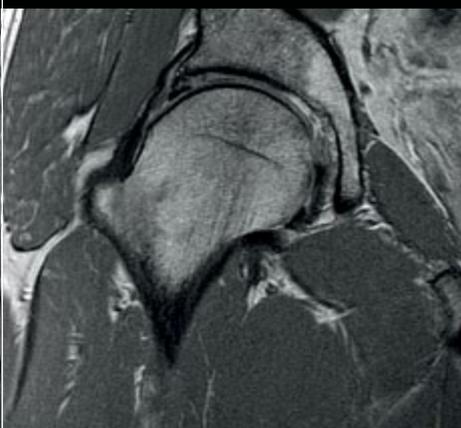
A smart business decision

“We decided at an early stage in our plans for I@OP to select one vendor for all our equipment,” explains Dr. Connell. “We wanted a collaborative relationship with a company with whom we felt comfortable; with whom we shared the same agenda. And we’ve no doubt that we made a very smart decision in pursuing a long-term collaboration with Philips. The local Philips team has been outstanding

PDW



PDW



Ganz lesion with labral tear

31-year-old AFL footballer with large Ganz lesion with extensive labral tearing in the right hip. Images taken with patient in the supine position with internal rotation to better visualize the hip abductor group. Coronal PDW hip imaging at 3.0T shows the pathology in exquisite detail. Treated by a hip scope performed at the end of the season with resurfacing and osteotomy.

Achieva 3.0T is used with SENSE Torso XL coil. PDW with TE 30, TR 3200, DRIVE to allow a lower TR while maintaining bright fluid signal, FOV 150, slice thickness 2.5 mm with 0.5 mm gap, 3 NSA, voxel size of 0.4 x 0.5 x 2.5, scan time 5:12 minutes.

“Because of the exceptional detail in the 3.0T images, we were able to say this was a tiny stress fracture rather than bruising.”

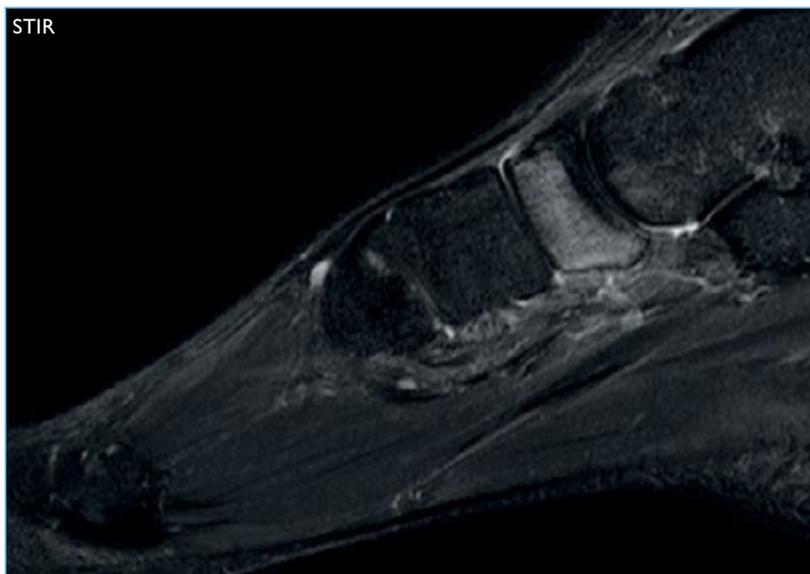
in supporting our activities and ambitions, both inside and outside the clinic. We also like the fact that the company is willing to help us invest in the future.”

The center now provides comprehensive imaging services across a range of modalities, and includes state-of-the-art Philips equipment such as an Achieva 3.0T X-series MRI scanner, a Brilliance 64-slice CT scanner as well as Interventional Fluoroscopy, Ultrasound and Digital Radiography units.

Growing reputation in MSK imaging

According to Dr. Connell, the Achieva 3.0T X-series is an excellent system, “Our MSK images are phenomenal, showing far more detail than comparable images taken on 1.5T systems at other institutions in our locality. The higher signal at 3.0T allows us to image with much thinner slices and higher resolution with no compromise on scanning speed. We strive to be the best in this country,” he says.

Dr. Connell is particularly impressed with the clear visualization of tiny muscle tears and stresses in bone before they become full-blown stress fractures that could end an athlete’s season. “We often scan athletes, for example cricketers or gymnasts, who’ve been referred to us with back pain without an obvious cause. Usually we first perform a 3.0T MRI scan of the pars interarticularis with very thin 1 mm slices, which invariably reveals tiny cracks in the bone that we couldn’t see with other imaging methods. We had a recent case of a professional footballer complaining of chronic foot pain. The cause was a 2 mm stress fracture in the navicular bone that was only revealed on the 3.0T images. An MRI performed elsewhere failed to pick this up, and only because of the exceptional detail



Stress reaction in left forefoot

23-year-old AFL footballer complaining of chronic foot pain.

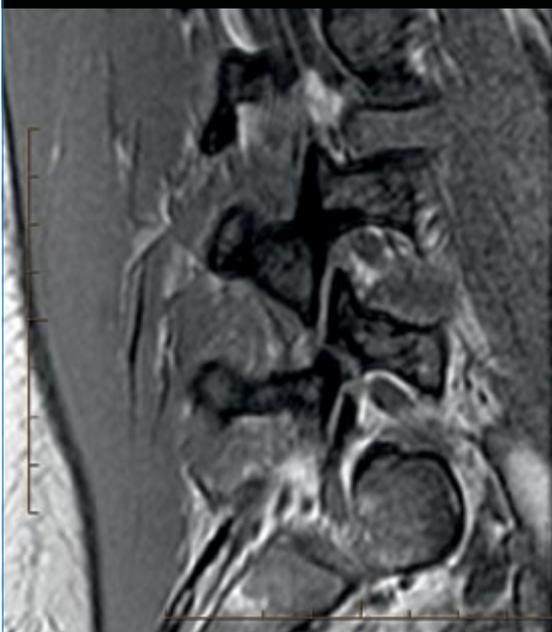
MR image of the mid foot, aligned – on an axial image – to the tarso-metatarsal joint articulations and tarsals, shows stress reaction of the dorsal aspect of the navicular that could not be seen with x-ray or on a 1.5T MRI system. Treatment included application of an aircast boot and non-weight-bearing exercises.

Achieva 3.0T X-series with 8-channel SENSE Foot/Ankle coil. Sagittal STIR, FOV 150 x 105 mm, 2 NSA, slice thickness 2.0 mm with 0.3 gap, voxel size of 0.48 x 0.61 x 2.0 mm, scan time 3:15 minutes.

in the 3.0T images were we able to see that this was a tiny stress fracture rather than bruising,” he says.

With the high image quality they are getting, the radiologists at I@OP now consider 3.0T MRI to be a serious contender to replace CT in many of their MSK examinations, including examinations of stress fractures of the feet and pars interarticularis of the spine. “We have also found the Achieva 3.0T more sensitive than ultrasound in visualizing and quantifying small muscle tears and strains,” explains Dr. Connell. “We now have exquisite detail of subtle capsular and ligament sprains around the knee and ankle, which we could not previously see with 1.5T imaging. And our surgeons also tell us that we are much more accurate at finding and describing small labral tears in the hip joint.”

Reformatted T1 THRIVE



Stress fracture of pars interarticularis

16-year-old female with lower back pain indicating a stress fracture of the pars interarticularis. Oblique reconstruction of T1 THRIVE data through the pars interarticularis shows the classic “scotty dog appearance”. Note the fracture through the neck of the pars. These stress fractures generally occur in teenagers and previously required an additional CT with or without a nuclear medicine scan, both of which expose the developing body to high radiation doses.

Achieva 3.0T X-series with 15-channel SENSE Spine coil. T1 THRIVE (T1-weighted high resolution 3D TFE) with reconstructed to voxel size $0.53 \times 0.53 \times 1.00$ mm, scan time 4:32 minutes.



Sequences optimized for spatial resolution and scan time

According to Dr. Connell, there is no secret to the exceptional image quality they are getting at I@OP. “Proton density and proton density fat-suppressed sequences are our workhorses, and the imaging performance we’re getting comes simply from finessing these sequences for spatial resolution and scan time. We use the smallest FOV and voxel size that we can in order to maximize the spatial resolution and continually push the boundaries of the machine.”

The I@OP team has also just started using diffusion-weighted imaging (DWI) for muscle, something that until now has not been routine in MSK imaging. This method is sensitive to changes in the direction of water molecule motion and may assist in non-invasively diagnosing conditions such as compartment syndrome – a limb-threatening condition observed when perfusion pressure falls below tissue pressure in a closed anatomic space such as the calf, which if untreated can lead to tissue necrosis, permanent functional impairment and even renal failure.

“DWI also helps visualize how a muscle tear, such as a hamstring tear, is healing, allowing the athlete’s physiotherapist to assess the most appropriate time to resume training,” Dr. Connell remarks.

Future prospects

Modern developments such as Philips’ MultiTransmit and dStream are further enhancing high field MRI and Dr. Connell and his colleagues already have plans for the installation of a new Philips Ingenia 3.0T system which embodies these advanced features by the end of 2011. ■

“Pursuing a long-term collaboration with Philips was a very smart move for us.”