

Multislice CT Arthrography of the Knee

Multislice CT is a valuable tool in evaluating derangement of the knee including lesions of the menisci, hyaline cartilage and ligaments. The technique is best utilised using the latest multislice CT. CT has a role due to restricted access to MRI and patients with MRI contraindications.

Technique: An intra-articular injection of ionic contrast medium is administered, coating the cartilage and meniscal surfaces.

Patients are scanned with their knee in a supine position with 20 degrees of knee flexion, so that imaging of the ACL is optimised. Scans are obtained in the axial plane.

Coronal, sagittal and axial images are reconstructed from the raw data.

Meniscus: CT knee arthrography can be used to diagnose suspected meniscal tears. A meniscal tear is defined by the presence of contrast medium in the meniscal substance. Images 1-3 define a tear of the posterior horn of medial meniscus (arrows).

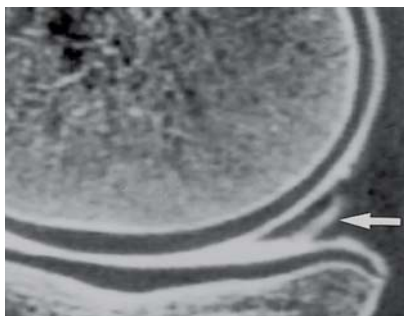


Image 1: Sagittal reconstruction

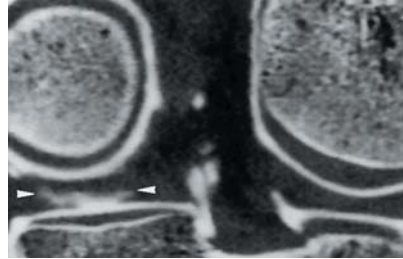


Image 2: Coronal reconstruction

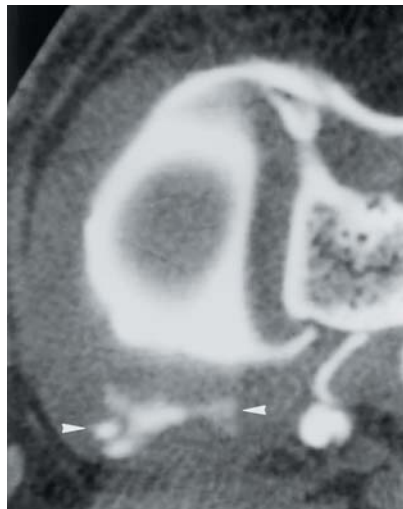


Image 3: Axial reconstruction

Image 4 shows a tear of the posterior horn of the medial meniscus (large arrow) with a fragment displaced into the articular space (arrowhead) and focal cartilage ulceration in mid third of femoral condyle (small arrows).

Cartilage: CT arthrography provides unparalleled views of the surface of the articular cartilage. Penetration of contrast material within the cartilage substance indicates a defect of the normally continuous surface. Cartilage thinning may also be appreciated. CT arthrography may not pick up changes of early chondromalacia patellae, as it cannot

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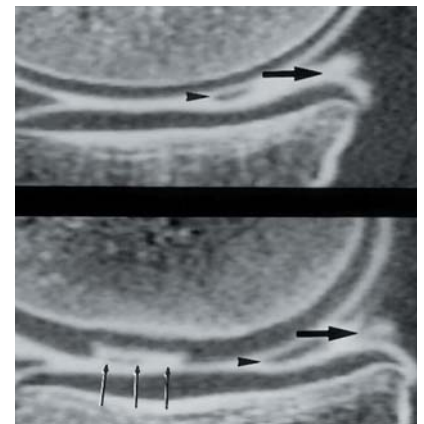


Image 4: Sagittal reconstructions

image deep layers of cartilage that are not associated with substance loss or morphologic surface changes.

Images 5 and 6 (over page) show an osteochondral lesion (white arrow).



Image 5: Coronal reconstruction

Continued on page 2



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Image 6: Sagittal reconstruction



Image 8: Sagittal reconstruction



Image 7: Coronal reconstruction



Image 9: Sagittal reconstruction

Image 7 and 8 show a chondral lesion (white arrow).

Ligaments: MRI is the imaging modality of choice for the depiction of normal and abnormal ligaments, because it enables the direct visualisation of the ligament due to its high contrast resolution. CT knee arthrography can be useful in defining ACL tears. Image 9 shows an ACL tear (white arrow).

Indications of CT Knee

Arthrography: MRI is still the imaging choice for assessing internal derangement of the knee. CT has a role due to restricted access to MRI and patients with MRI contraindications. CT arthrography is considered to be more accurate in assessing chondral outlines.

CT knee arthrography is available at our Southport and The Tweed Hospital clinics.

CT Quick Reference Guide

HEAD / FACIAL

Head injury – bone / brain assessment
Headache
Sinus disease
Facial bone fractures
Temporal bone – conductive hearing loss
Internal auditory meatus
(where MRI unavailable)
Stroke investigation
Intracerebral arteries

EXTREMITY

Detection of subtle fractures
Work-up of complex fractures
Assessment of bone fusions / delayed healing
Bone lesion work-up
Osteochondral defects
CT arthrography
Shoulder / hip
– Labral abnormalities
– Instability
Knee
– Meniscal tears (if MRI unavailable or contraindicated)
– Loose osteocartilaginous bodies
Elbow
– Loose Osteocartilaginous bodies

CHEST

Haemoptysis
Trauma
Bronchiectasis
Interstitial lung disease

Solitary / multiple pulmonary nodules
Pulmonary embolus
– CT pulmonary angiography
Mediastinal mass
Tumour staging
Coronary artery calcium scoring

ABDOMEN

Lesion assessment and characterisation
– liver, pancreas, kidneys, spleen
Carcinoma staging
Renal colic – CT urogram
Inflammatory process
– Collection, abscess
– Diverticulitis
– Appendicitis
– Pancreatitis
Obstructive jaundice
– pancreatic head pathology
Distal CBD stone – CT cholangiography
Malignant ascites, peritoneal tumour plaques, lymphadenopathy
Abdominal aorta – AAA diagnosis / monitoring
Pelvimetry
Trauma

SPINE

Spinal canal stenosis
Radiculopathy
Spondylolisthesis
Assessment of bony fusions
Crush fracture assessment

NECK

Tumour / mass assessment
Multi nodular goitre – retrosternal extension
of thyroid goitre
Tracheo-malacia
Malignancy and tumour staging
Carotid disease

INTERVENTIONAL

Facet joint injections
Nerve root / foraminal injections
Biopsies
Drainages
Cyst aspirations

CT ANGIOGRAPHY

Carotids
Circle of Willis
Abdominal aorta
Renal arteries
Thoraco-abdominal aorta
Popliteal studies
Subclavian arteries
Visceral vessels
Aortobifemoral and lower limb runoffs
Thoraco-abdominal aorta
Aortic arch
Extremity vessels – wrist / forearm arteries,
ankle / foot arteries
Carotid / Circle of Willis as one study

Multislice CT

Gold Coast Medical Imaging (GCMi) and Tweed Valley Radiology are proud to announce that with the recent installation of a new GE Lightspeed multislice CT at The Tweed Hospital, Tweed Heads, we are the only multiple site radiology practice on the Gold Coast that has invested exclusively in multislice CT.

Some of the clinical applications and benefits of multislice CT include:

1. Patient Comfort

Breath hold times are reduced so that CT pulmonary angiograms as well as CT of the chest and abdomen are more comfortable for patients, whilst at the same time reducing breathing artefacts and improving image quality. Shorter examination times reduce the discomfort for patients who have difficulty lying down. Patients with back pain and dyspnoea should find this of particular benefit.

2. CT Angiogram Quality

Dramatic improvements in the quality of CT angiograms has now been achieved. The slice thickness can be reduced with the increase in the number of slices the new generation of multislice machines can achieve. This means that CT angiography can now replace conventional angiography in

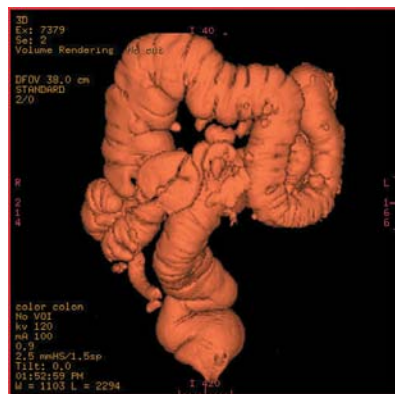
many instances. The cerebral arteries as well as the carotid, subclavian, thoracic and abdominal aorta, renal and leg arteries now become routine studies. We are now capable of performing a CT angiogram of the leg arteries from the level of the renal arteries down to the toes.

3. Musculoskeletal CT

With the improvement in resolution of multislice CT, peripheral joints can be examined with exceptionally sharp images. This is an excellent investigation for patients with persistent pain following trauma and normal plain films.

4. Reduced Metal Artefact

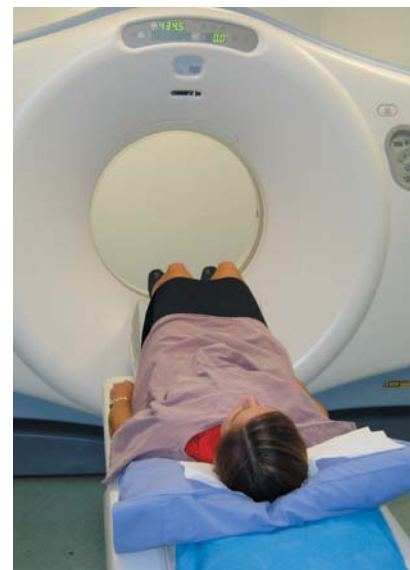
Metal artefact is greatly reduced allowing examinations of orthopaedic patients with metal plates and screws in situ. This is of great benefit in patients with back pain who have plates and pedicle screws in place.



5. 3D Reformatting

All examinations can be performed as a spiral CT allowing the volume of data to be analysed in any plane. The resultant images now look more like an image out of Grant's Atlas than a CT image.

The thinner slices means that these reformatted images have almost

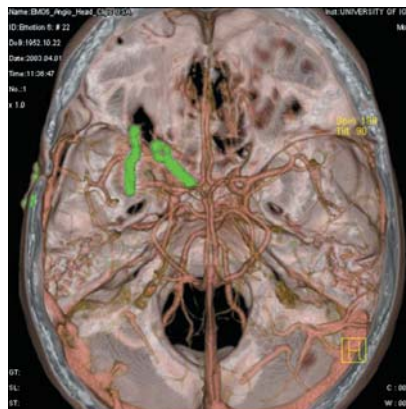


identical resolution in all planes. This aids image interpretation. Patient comfort is also improved as the patient is no longer required to lie in an uncomfortable position. The reformatted images are of great benefit in examinations such as CT of facial sinuses where the patient no longer needs to extend their head.

6. Images on CD ROM

CT images are now available on CD ROM instead of, or in addition to, conventional films. Each CD ROM has a viewing program incorporated with the images so the disk only needs to be inserted into the computer's drive and the program will auto play. The advantages of CD ROM include storage of larger amounts of data, decreased storage space compared to film and the ability for radiologists to compare previous examinations on the work station. If you would like your CT images on CD ROM, please write "CD-ROM" on the request form. There is no additional cost for CD ROMs.

Please note – Patients attending our Southport clinic will have CD ROMs available with films. Patients attending our Burleigh Waters (Treetops), Tweed Heads or The Tweed Hospital clinics will have CDs sent one to two days after delivery of films.



GCDGP Medical Ball 2004



Dr Kelly Francis and friends



Mrs Lisa Kothari and Dr Ruben Krishnananthan



Dr Ziggy Kusiak and Dr Izabela Kusiak



Dr Damien Hellwege, Mrs Janene Hellwege, Dr Jagat Singh and Mrs Kamaljit Singh



Dr Alison Sprague and Dr Stephen Sprague

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