MRI of the Forefoot and Midfoot
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MRI of the forefoot requires a high resolution technique utilising a small surface coil such as a wrist coil, centering on the region of interest (usually central forefoot or great toe). The imaging planes should be orthogonal to the region of interest, frequently requiring a double oblique prescription.

Metatarsalgia is the commonest clinical indication for forefoot MR examination. The study should focus on the central forefoot (MTPJ2-4), optimizing imaging planes for visualisation of the common plantar interdigital nerves and plantar plates. Sequences generally include sagittal PD and fat suppressed PD, short axis T1 and T2 perpendicular to the proximal phalanx of the 2nd toe and long axis fat suppressed PD. Common causes of metatarsalgia include Morton’s neuroma and 2nd MTP joint plantar plate degeneration / tear and associated synovitis. Other causes of metatarsalgia include stress-fatigue fractures of the metatarsal heads, plantar bursopathy, MTP joint synovial cysts / ganglia and intermetatarsal bursopathies.

First MTP joint injuries (turf toe) and chronic 1st MTP joint pain are relatively common indications for imaging of the 1st MTP joint. The imaging planes for assessing the great toe are determined by the orientation of the plantar margin of the 1st metatarsal head and the proximal phalangeal shaft. A double oblique prescription is required for the sagittal and long axis images. Pulse sequences typically include three plane PD and fat suppressed PD sequencing. Turf toe injury represents a heterogeneous group of capsulo-ligamentous injuries to the 1st MTP joint that may involve the collateral ligament complexes, plantar plates and intersesamoid ligament. Chondral and osteochondral lesions, sesamoid bone stress and soft tissue impingement lesions are common causes of chronic 1st MTP joint pain.

Relatively common forefoot masses include giant cell tumour of tendon sheath, plantar fibroma, plantar bursopathy and ganglia. Relatively common nail bed lesions include glomus tumours, epidermal inclusion cysts and subungual exostoses. Imaging of nail bed lesions requires a tailored high resolution approach, usually requiring iv contrast.

Infection in the forefoot is particularly common in diabetics. Contrast enhanced MRI is useful in delineating the extent of infection and presence of a complicating abscess or septic tenosynovitis.

MRI of the midfoot can be performed in a dedicated ankle coil or alternatively in a knee coil with the ankle in plantar flexion. The latter often provides more reliable frequency selective fat suppression. A high resolution approach is required with field of view reduced to cover the midfoot only and relatively thin slice thickness to optimize evaluation for ligamentous and chondral pathology (2mm in long axis, 2-2.5mm in the sagittal plane and 2.5-3mm in the short axis). Pulse sequences generally consist of long axis PD and fat suppressed PD, and sagittal and short axis fat suppressed PD sequencing,
with optional additional of short axis and sagittal PD seqences. Common indications for imaging include ligamentous midfoot injury, differentiation of insertional tibialis anterior tendinosis from medial midfoot arthropathy, distal tears of peroneus longus, midfoot ganglia, plantar fibroma and stress-insufficiency fractures.

The salient imaging findings for these pathologies in the forefoot and midfoot will be reviewed.