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PICTORIAL ESSAY

Benign Soft Tissue and Osseous Tumours of the Hand: a Pictorial Essay

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INTRODUCTION

Both soft tissue and osseous lesions of the hand are commonly encountered in everyday clinical practice. The majority of these lesions are benign, and imaging is often needed to determine the nature of the lesion. Some lesions demonstrate characteristic features that enable diagnosis without intervention. For soft tissue lesions, plain radiographs have a limited role in diagnosis but are useful to demonstrate calcification or mineralisation. Ultrasonography and magnetic resonance imaging (MRI) play an important role in characterisation of soft tissue masses of the hand. Ultrasonography can differentiate cystic from non-cystic masses and MRI can further characterise the latter. Benign primary bone tumours of the hand are often found incidentally during presentation of unrelated injuries or pain due to pathological fracture. Radiography is usually the first imaging of choice with computed tomography or MRI reserved for complex cases. It is important to be familiar with the variety of lesions that can occur in the hand so that appropriate clinical management can be instigated and unnecessary interventions avoided. In this article, we review the imaging findings of common benign hand lesions with attention to their discriminating features.

BENIGN SOFT TISSUE TUMOURS

Ganglion Cyst

Ganglion cysts are the most commonly encountered soft tissue mass in the hand and wrist region.[1] They tend to occur in adults, with a female predominance. The prevalence of ganglion cysts in the hand and wrist region has been reported in up to 51% of the asymptomatic adult population.[1] The most common location is in the dorsum of the wrist, typically close to the scapholunate joint. Other less common sites include the volar aspect of the wrist and flexor tendon sheath of the fingers. Ganglion cysts are thought to represent degeneration of connective tissue caused by chronic irritation.[2] A tendon sheath cyst consists of a special ganglion cyst subtype located along the course of a tendon sheath. Tendon sheath cysts should be distinguished from the rarer intratendinous cysts that are believed to result from recurrent injury to the tendon with subsequent cystic degeneration. Intratendinous ganglia are clinically relevant because they weaken the structure of tendons and may predispose them to rupture.[3] Diagnosis is usually made by ultrasonography (Figure 1). On ultrasonography scans, ganglion cysts appear as unilocular or multilocular anechoic to hypoechoic lesions with posterior acoustic enhancement.

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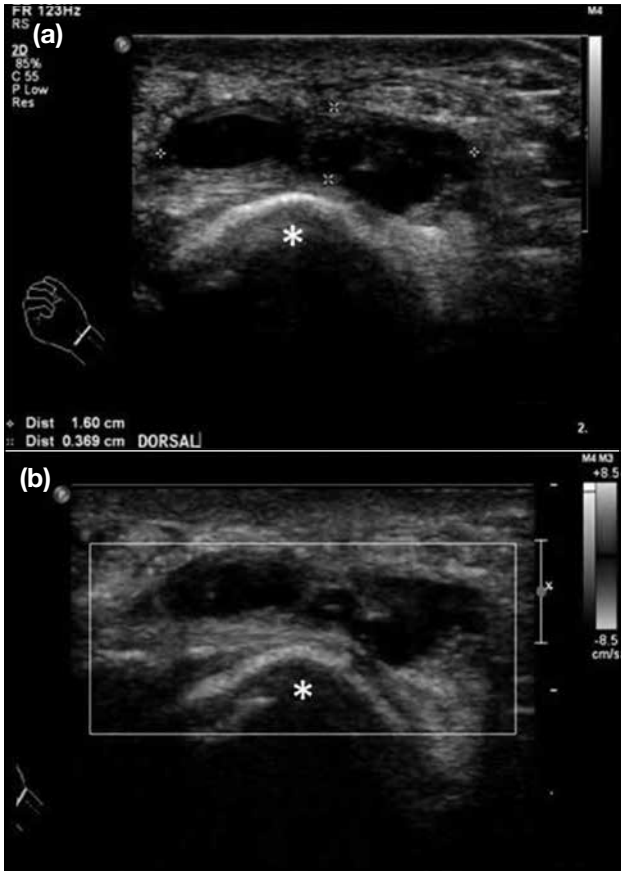

Figure 1. Ganglion cyst in a 37-year-old woman who presented with right wrist mass: (a) Sonographic examination of the dorsal side of the right wrist showing multiloculated hypoechoic lesion at the radial aspect of the dorsal right radius (asterisk). (b) No internal vascularity is evident.

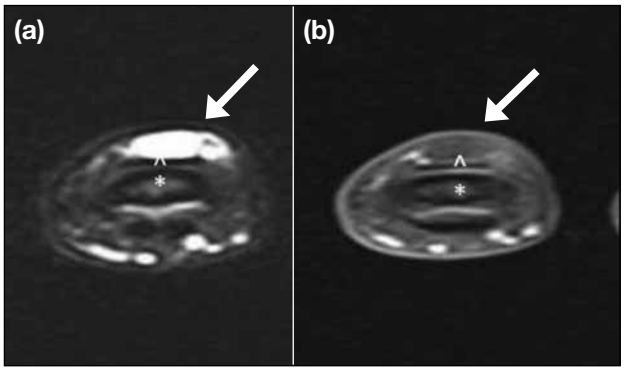

Figure 2. Ganglion cyst in a 40-year-old woman who presented with right middle finger mass: (a) T2-weighted axial magnetic resonance image showing marked hyperintense well-circumscribed lobulated lesion (arrow) over the dorsal aspect of the middle finger, at the distal phalanx (asterisk) level. The lesion is seen abutting and dorsal to the extensor tendon (arrowhead). (b) Post-contrast T1-weighted axial fat-saturated magnetic resonance image showing no contrast enhancement.

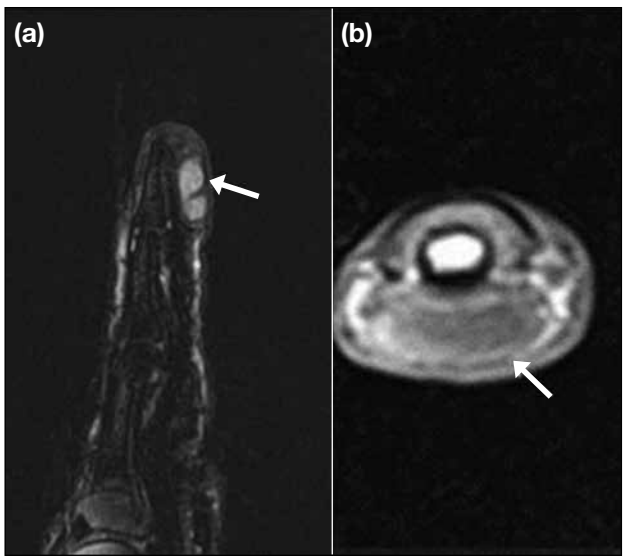

Figure 3. Epidermoid inclusion cyst in a 53-year-old man who presented with left index finger mass: (a) Sagittal T2-weighted magnetic resonance image showing a lobulated circumscribed mass (arrow) over the volar aspect of the index finger, at the distal phalangeal level with homogeneous hyperintense signal and thin hypointense internal septum. (b) Post-contrast T1-weighted axial magnetic resonance image showing mild peripheral incomplete rim enhancement while its internal content remains non-enhancing.

Occasionally, the neck of the lesion may demonstrate extension towards the adjacent joint. On MRI scans (Figure 2), ganglion cysts are seen as well circumscribed unilocular or multilocular cystic lesions without corresponding contrast enhancement. Sometimes, they may demonstrate an isointense or hyperintense T1 signal due to proteinaceous content or haemorrhage.

Epidermoid Inclusion Cyst

Epidermoid cyst formation (Figure 3) results from proliferation of surface epidermal cells within the confined space of the dermis. It is a common benign cystic lesion that can occur anywhere in the body with about 10% found in the upper limbs. It is commonly seen secondary to trauma with implantation of epithelial squames into the dermis. In the hands, it is usually seen within subcutaneous tissue at the finger pulps. It can also cause adjacent bony erosion that is evident on radiograph or computed tomography. On MRI scan, it is seen as a well-circumscribed lesion with variable signal intensity on T2-weighted sequence depending on the chemical composition. Lesions with a high lipid content will demonstrate hyperintense signal on both T1- and T2-weighted images, whereas lesions with keratin and microcalcifications will demonstrate

low signal intensity on T2-weighted images. After administration of gadolinium contrast, there is a lack of enhancement in uncomplicated cases. Peripheral rim enhancement is possible with underlying inflammatory or infective changes.[4] In cases of ruptured epidermal cyst, MRI scan may show thick and irregular peripheral rim enhancement, surrounding soft tissue reactions, and/or variable septa, therefore simulating an infectious or neoplastic lesion. It might resemble some malignant soft tissue tumours with central necrosis and these should be included in the differential diagnosis list.[5]

Giant Cell Tumours of the Tendon Sheath

Tenosynovial giant cell tumours are a group of generally benign soft tissue tumours with common histological findings. Previously termed villonodular tenosynovitis, the tumours are commonly found in the hand region.[6] The tumours are lobulated, well circumscribed and at least partially covered by a fibrous capsule. Their microscopic appearance is variable, depending on the proportion of mononuclear cells, multinucleated giant cells, foamy macrophages, and siderophages and the amount of stroma. Haemosiderin deposits are virtually always identified.[7] Tenosynovial giant cell tumours can be roughly divided into two distinct forms: localised and diffuse. The localised form primarily occurs extra-articularly in the tendon sheaths of the hand and foot, or sometimes in bursa; whereas the diffuse form occurs in larger joints with a more aggressive growth pattern and associated with a higher recurrence rate. The aetiology of giant cell tumour of the tendon sheath remains uncertain. They usually present as a painless mass in the hands or feet with non-specific clinical features and are seen close to a joint or tendons on imaging. Pressure erosion in adjacent bone can be seen on plain radiographs in 10% to 20% of cases.[8] MRI is currently the optimal modality for preoperative assessment of tumour size, extent and invasion of adjacent joint and tenosynovial space.[9] On MRI scans (Figure 4), the tumour has a low signal intensity on T1-weighted imaging and variable, but usually low to intermediate, signal intensity on T2-weighted imaging. There is moderate contrast enhancement after intravenous gadolinium contrast medium injection. Susceptibility artefact on gradient echo sequence is typical due to haemosiderin deposition. This is rarely seen in other masses and serves as a useful feature to differentiate from other soft tissue lesions in the hand.

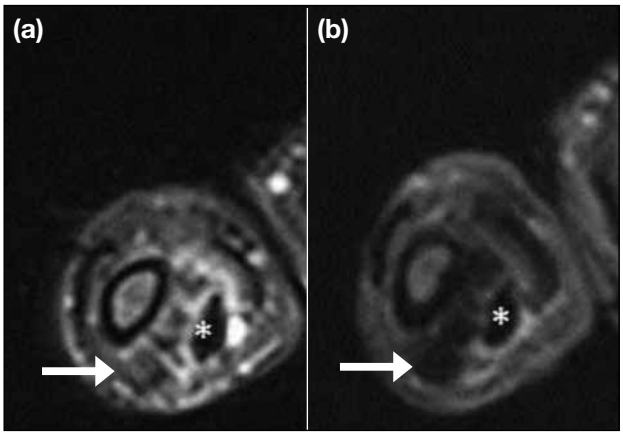

Figure 4. Giant cell tumour of tendon sheath in a 48-year-old woman who presented with right thumb nodularity: (a) T2-weighted fat-saturated axial magnetic resonance image showing multi-lobulated lesion (arrow) at the volar aspect of the thumb at the interphalangeal level with intermediate signal intensity. It is seen adjacent to and partially encasing the flexor tendon (asterisk). (b) Gradient echo axial magnetic resonance image showing blooming artefacts with internal marked hypointense signal.

Peripheral Nerve Sheath Tumour

Benign peripheral nerve sheath tumours include schwannomas and neurofibromas. They are commonly found in the forearm and hand region. Schwannomas arise from the Schwann cells surrounding the nerve whereas neurofibromas arise from the central nerve fascicles. Schwannomas tend to occur in larger and deeper nerves whereas neurofibromas tend to arise from smaller cutaneous nerves.[10] Clinically, they are usually seen in adults as a painless slow-growing mass. Most are not associated with neurofibromatosis. Ultrasonography shows a fusiform hypoechoic lesion with a "dural tail" representing the entering and exiting nerve. This may be difficult to visualise in smaller and superficial cases. On MRI (Figure 5), they are generally of low-to-intermediate signal intensity on T1-weighted sequence, high signal intensity on T2-weighted sequence with homogeneous contrast enhancement. For larger lesions, target sign with central T2 hypointense signal may be observed, more frequently in neurofibromas. Schwannomas can undergo cystic or fatty degeneration. Features including large size (>5 cm), infiltrative margins, marked heterogeneity and rapid growth should raise concern about underlying malignant change.[11]

Lipoma

Lipomas are the most common soft tissue tumour in adults. They are only occasionally seen in the hand and wrist regions, and account for only 5% of all lipomas occurring in the upper limb.[12] Clinically, they present as a painless slow-growing mass, typically at the thenar

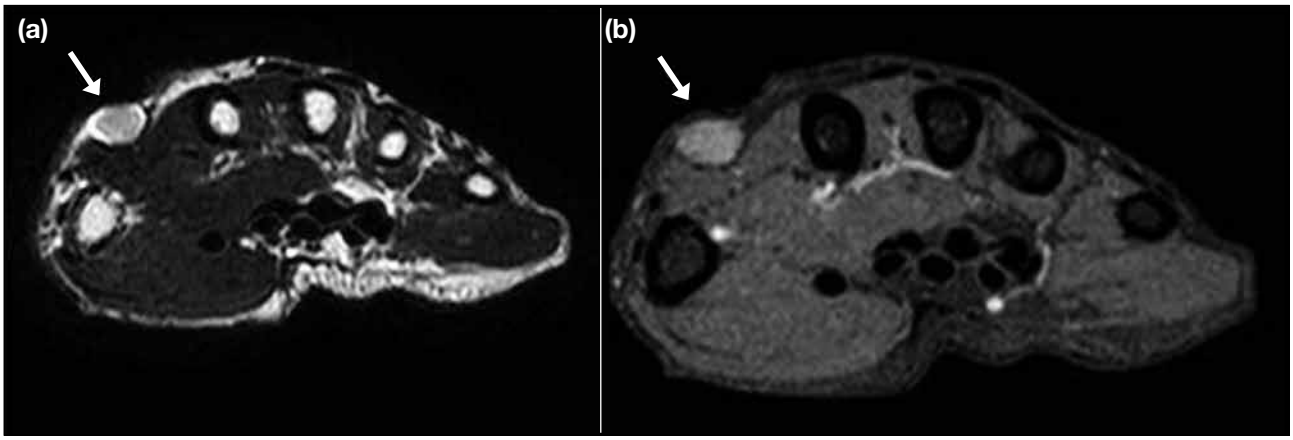

Figure 5. Neurogenic tumour in a 68-year-old woman who presented with first webspace nodule: (a) T2-weighted axial magnetic resonance image showing an oval hyperintense lesion (arrow) in the subcutaneous tissue of the dorsal aspect of the first webspace. (b) T1-weighted post-contrast fat-saturated magnetic resonance image showing corresponding contrast enhancement. It is seen to be closely related to a tubular structure, probably the superficial branch of the radial nerve (not shown).

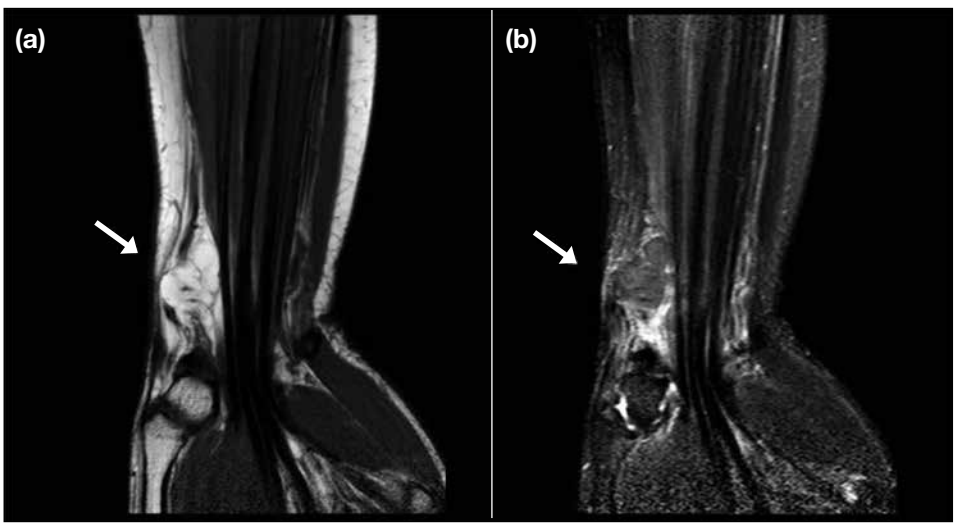

Figure 6. Lipoma in a 56-year-old man who presented with swelling at the radial volar aspect of the left wrist: (a) T1-weighted coronal magnetic resonance image showing a multilobulated hyperintense subcutaneous lesion (arrow). (b) Short-tau inversion recovery coronal magnetic resonance image showing signal intensity drop of the corresponding lesion.

or hypothenar eminence. Compression on adjacent nerves or vessels may occur in cases where they are in a confined space such as the carpal tunnel. Characteristic sonographic features of a lipoma are an encapsulated hyperechoic lesion with fine linear internal echogenic echos.[13] However, the echogenicity may be variable. On MRI (Figure 6), lipomas show homogeneous hyperintense signal on T1-weighted sequence with corresponding signal intensity drop on short-tau inversion recovery or fat-saturated sequence. Thick enhancing septation and nodular or a solid component raises suspicion for atypical lipoma and liposarcoma.[14]

Glomus Tumours

Glomus tumours typically occur in young adults but may occur at any age. There is no sex predilection except in subungual lesions that are far more common in women.[7] A glomus tumour is a benign proliferation of cells from the glomus body that is involved in regulation of vascular flow for temperature control. It is occasionally seen in the hand region, accounting for about 1% of all hand tumours.[7] Typically, they are seen as subungual masses in the fingertips. They may present with pain, temperature sensitivity and point tenderness.[15] Pressure erosion may also be seen on radiographs. On ultrasound

scans, they appear as a non-specific, solid, hypoechoic mass beneath the nail, possibly with associated erosion of the underlying phalangeal bone. The high-velocity flow in intratumoural shunt vessels causes this lesion to be hypervascular on colour Doppler imaging, and is diagnostic.[16] On MRI (Figure 7), glomus tumours demonstrate low signal intensity on T1-weighted sequence with homogeneous hyperintense signal on T2-weighted sequence and intense contrast enhancement. magnetic resonance angiography is a useful non-invasive adjunct to conventional MRI for establishing the diagnosis of glomus tumour. Typical magnetic resonance angiographic findings include areas of strong enhancement in the arterial phase and tumour blush, with increase in size in the delayed phase.[16] The characteristic location at the subungual region with the above imaging features allows its differentiation from other fingertip lesions. MRI remains the imaging of choice in suspected recurrent cases after surgery.[17]

Dupuytren's Contracture

Dupuytren's contracture or palmar fibromatosis is a fibrosing condition that typically presents as painless subcutaneous nodularity over the palmar surface of the hand.[18] The disease most commonly occurs in patients aged >65 years with a male predominance. It is considered the most common of the superficial fibromatoses and is thought to affect 1% to 2% of the population. These nodules can slowly progress to cords and bands and may cause flexion contracture secondary to fibrous attachment to the underlying tendon sheath. On ultrasound scans, they are seen as subcutaneous nodules superficial to the flexor tendons. These lesions are typically found at the level of the distal palmar crease, commonly with an epicentre at the distal metacarpal, most commonly the fourth digit.[19] On MRI (Figure 8), Dupuytren's contracture is seen as nodularity or cord-like superficial masses that arise from the palmar aponeurosis. Typically, these lesions are of low signal intensity on all pulse sequences without contrast enhancement. Occasionally, they may show intermediate signal intensity on both T1- and T2-weighted images with contrast enhancement, possibly due to a higher cellular component.

Venous Malformation

Vascular malformations can be subcategorized according to their flow dynamics into low and high flow types.[20] Low flow types include venous, lymphatic, capillary-

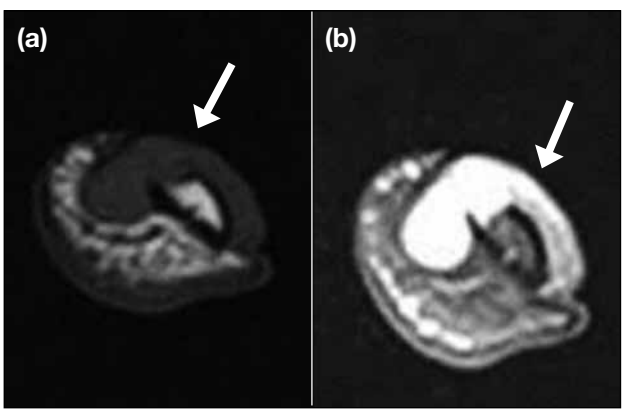

Figure 7. Glomus tumour in a 23-year-old man who presented with a 10-year history of left thumb mass: (a) T1-weighted axial magnetic resonance image showing a hypointense lobulated mass (arrow) over the dorsal aspect of distal phalanx of the thumb, lying underneath the nail plate of the distal phalanx. Erosion of underlying bone over the ulnar aspect is suspected. (b) T1-weighted post-contrast fat-saturated axial magnetic resonance image showing there is nearly homogeneous contrast enhancement.

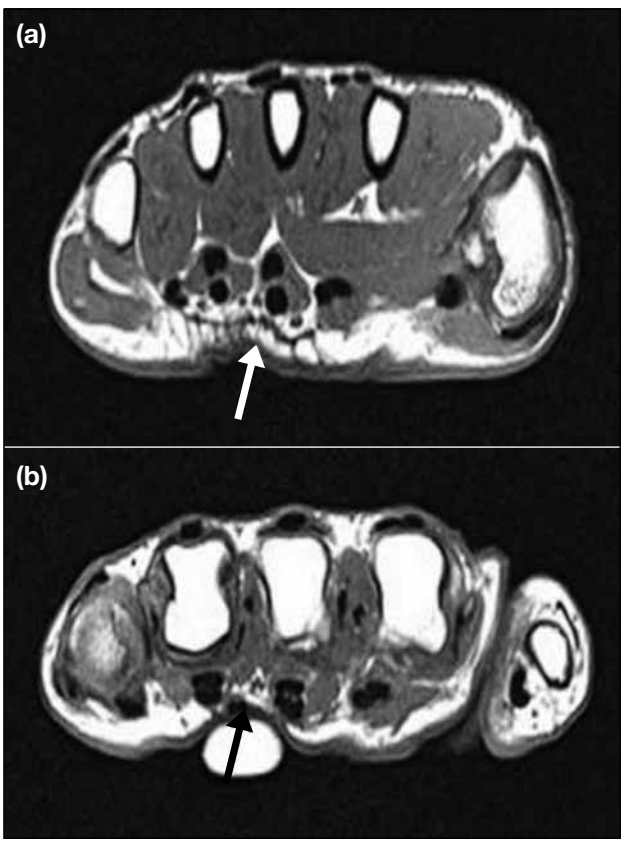

Figure 8. Dupuytren's contracture in a 62-year-old woman who presented with left palm mass for 3 years: (a) T1-weighted axial magnetic resonance image showing thickened palmar aponeurosis with hypointense signal (white arrow). (b) T1-weighted axial magnetic resonance image at a more distal level as shown in (a) demonstrates a hypointense plaque-like lesion at the subcutaneous tissue (black arrow), attaching to the palmar aponeurosis.

venous and capillary-lymphatic-venous malformations. The presence of an arterial component indicates a high flow lesion that includes arteriovenous malformations and arteriovenous fistulas. Venous malformation (Figures 9 and 10) is the most common peripheral vascular malformation, usually seen in the head and neck region, trunk and extremities. Venous malformation typically presents as a soft, compressible and non-pulsatile slow-growing mass. On MRI (Figure 11), vascular malformations are seen as infiltrative lobulated lesions without significant mass effect, with hyperintense T2 signal and gradual enhancement on post-contrast images. Phleboliths may be present. No flow void is demonstrated. Delayed contrast-enhanced sequences are also helpful in demonstrating any connection between the malformations and deeper venous vessels. This is an important detail to confirm prior to intervention since these lesions have been linked to a greater risk of deep venous thrombosis.[21]

Figure 9. An 18-year-old woman presented with right palm mass for 1 year: Frontal radiograph of the right hand showing a tiny opacity (arrow) over the radial aspect of the third metacarpal-phalangeal joint. It could represent a phlebolith. Otherwise there is no focal bone lesion.

Aneurysm/Pseudoaneurysm

Aneurysms and pseudoaneurysms in the hand are occasionally seen in clinical practice.[22] Pseudoaneurysms usually occur secondary to trauma but may be iatrogenic following arterial puncture. True aneurysms are uncommon and may be associated with underlying vasculitis. On ultrasound scans (Figure 12), aneurysms and pseudoaneurysms demonstrate turbulent flow with a characteristic yin-yang sign on colour Doppler images. A to-and-fro pattern may be seen with pulsed Doppler images. Signal intensity on MRI is variable, depending on the presence of thrombus or turbulent flow.

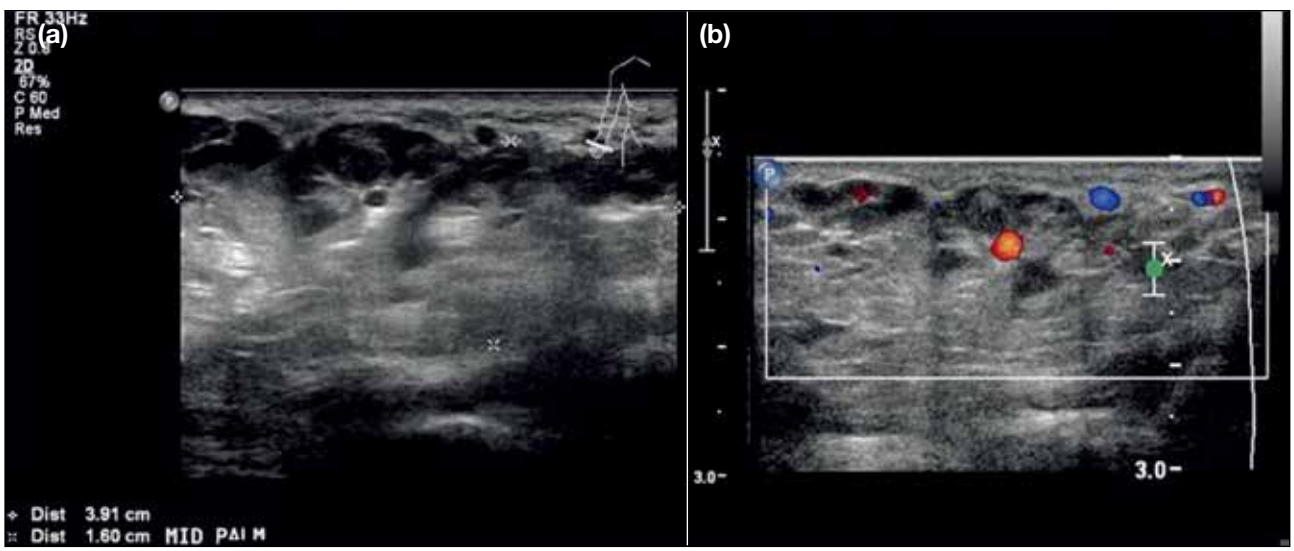

Figure 10. This is the same patient as Figure 9a. Ultrasound image of mid palm in the transverse plane showing an infiltrative multilobulated hypoechoic lesion with low levels of echo, extending from the proximal palm (just distal to the exit of carpal tunnel) down to the metacarpophalangeal joint level (not shown). (b) Multiple loculations with vascularity and venous flow visible on colour Doppler examination.

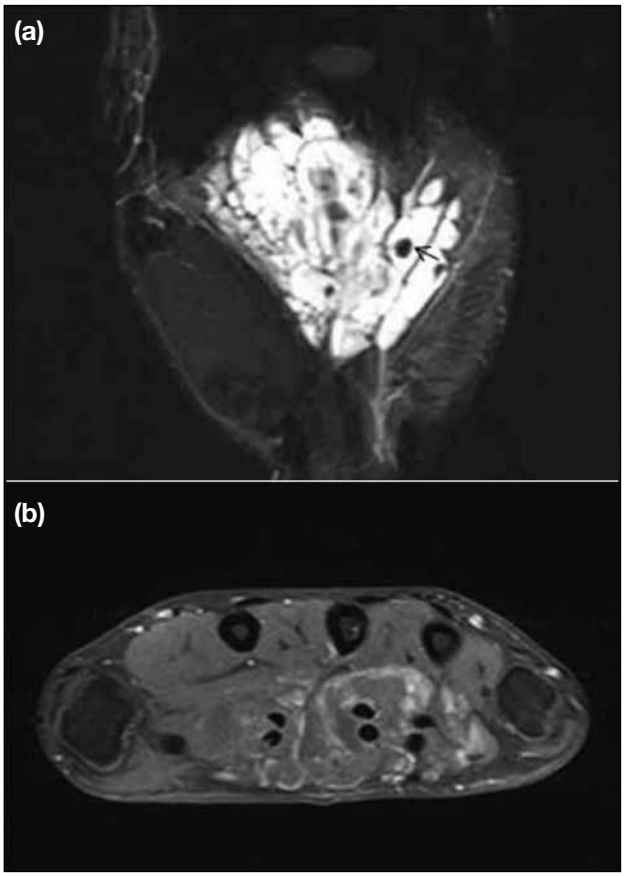

Figure 11. This is the same patient as in Figure 9 and 10a. T2-weighted short-tau inversion recovery coronal magnetic resonance image showing a multilobulated hyperintense lesion with extension from the level of the distal carpal row proximally to the metacarpophalangeal joint level distally. Internal low-signal-intensity foci are suggestive of phleboliths (arrow). (b) Post-contrast T1-weighted fat-saturated magnetic resonance image showing patchy peripheral contrast enhancement. The diagnosis is venous malformation.

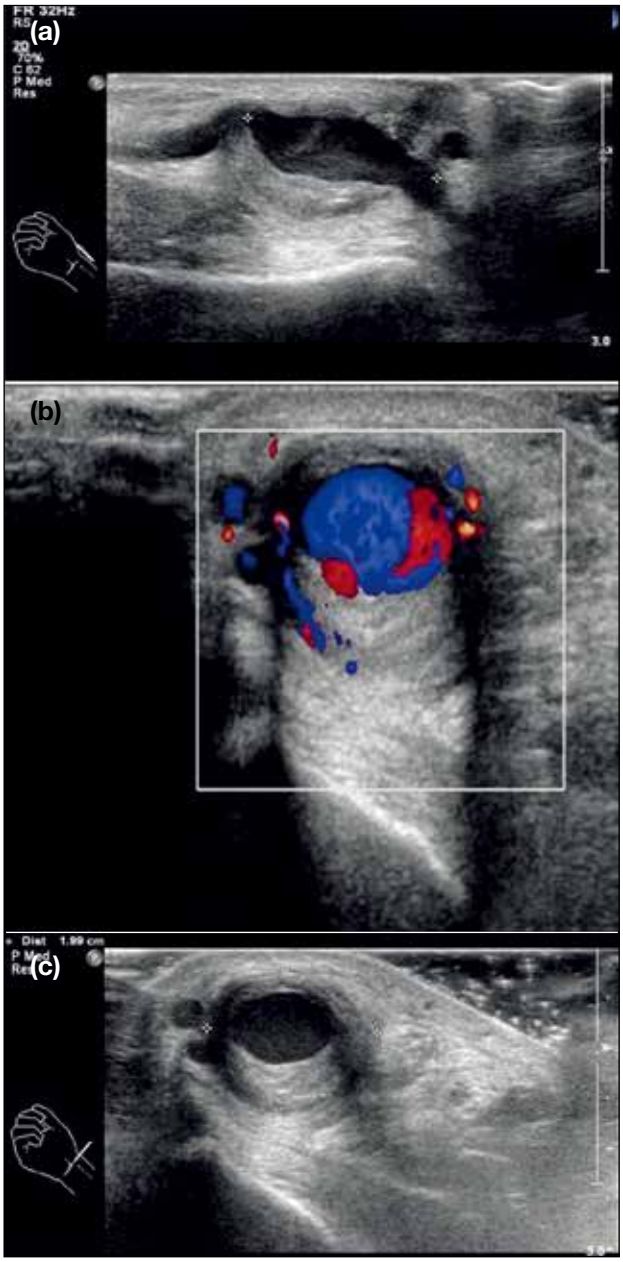

Figure 12. Pseudoaneurysm of the radial artery in a 49-year-old man who presented with right wrist mass after injury: (a) Ultrasound image of the right wrist in the longitudinal plane showing an elongated hypoechoic lesion. (b) The same lesion in the transverse plane shows an eccentric peripheral hyperechoic component, suggestive of thrombus formation. (c) Colour Doppler revealed arterialised flow and it appears in continuity with the radial artery (not shown).

Generally, aneurysms and pseudoaneurysms are slightly hyperintense on T1- and T2-weighted sequence with signal void. Susceptibility artefact may be demonstrated in the presence of thrombosis. Sometimes, continuity with the parent artery is seen. These characteristic imaging features allow diagnosis and avoid unnecessary and dangerous biopsy.

Fibroma of the Tendon Sheath

Fibroma of the tendon sheath is a rare condition and most (around 82%) are found in the hand and wrist region.[9-23] It is usually seen in adults (20-50 years old) with a male predominance. It is composed of well-circumscribed nodules on histology that are typically paucicellular, containing spindled fibroblasts embedded in a collagenous stroma.[7] Clinically, fibromas manifest as painless slow-growing masses, typically well-circumscribed and small (<3 cm) with close proximity to a tendon or tendon sheath on imaging. On MRI (Figure 13), fibromas typically have a signal intensity equal to or lower than that of skeletal muscle on both T1- and T2-weighted sequences with a variable contrast

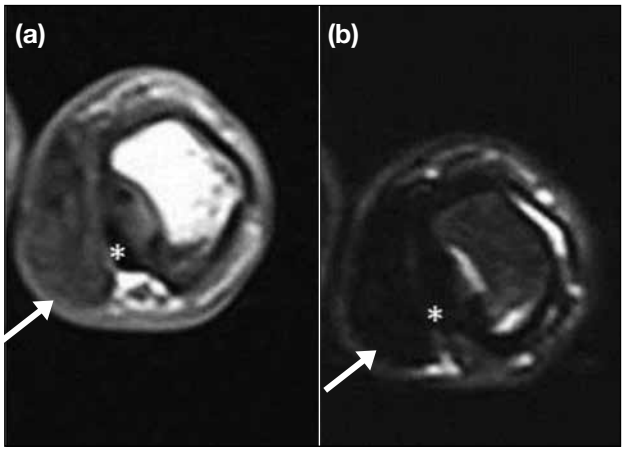

Figure 13. Fibroma of tendon sheath in an 80-year-old man who presented with left thumb mass for one and a half years: (a) T1-weighted axial magnetic resonance image shows an oval-shaped circumscribed mass (arrow) over the palmar aspect of the thumb, at the proximal phalangeal level, partially encasing the flexor tendon (asterisk). It shows T1-isointense signal to muscle with hypointense areas at its centre. (b) T2-weighted axial magnetic resonance image showing homogeneous hypointense signal over the corresponding lesion.

Figure14. Fibrolipomatous hamartoma of the median nerve in a 31-year-old woman who presented with left middle finger swelling. Frontal radiograph showing soft tissue swelling at the middle finger, more prominent over the distal and radial aspect.

enhancement pattern.[24] However, the T2 signal can be variable if areas of increased cellularity or myxoid change are present.[25] No susceptibility artefact is demonstrated on gradient echo sequence. The lack of blooming artefact in fibroma is helpful in differentiation from giant cell tumour of tendon sheath that may also present as a low signal lesion on both T1- and T2-weighted sequence on MRI. They also tend to have a lower signal on T2-weighted images and show less enhancement with intravenous contrast material compared with giant cell tumour of tendon sheath.[26]

Fibrolipomatous Hamartoma

Also known as neural fibrolipoma or perineural or intraneural lipoma, a fibrolipomatous hamartoma is comprised of hypertrophic mature fat and fibroblasts along the perineurium, surrounding the nerve bundles within the nerve sheath. It is a rare benign neoplasm leading to enlargement of the affected nerve, with predilection at the median nerve. Clinically, fibrolipomatous hamartomas present as slow-growing masses at the volar aspect of the hand and wrist region. They may be associated with macrodactyly (Figure 14), a condition known as macrodystrophia lipomatosa. Diagnosis can be made by ultrasonography or MRI, with longitudinally orientated fusiform structures representing enlarged nerve fascicles, giving a spaghetti-like appearance on coronal planes and coaxial cable

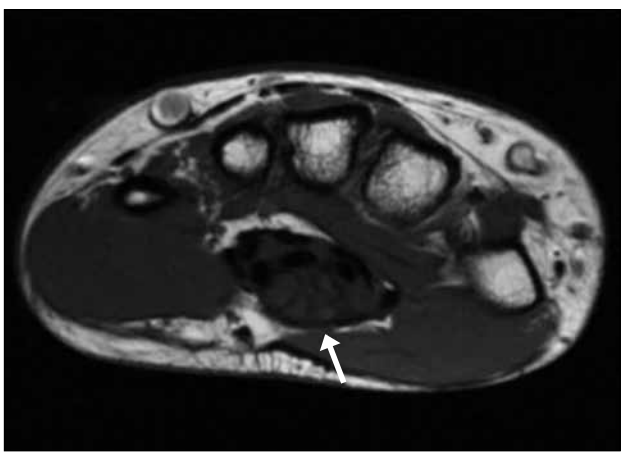

Figure 15. Same patient as in Figure 14. Axial T1 magnetic resonance image of the wrist showing characteristic coaxial appearance of the thickened median nerve (arrow) at the carpal tunnel.

appearance on axial images (Figure 15).[27] There will be areas of high and low T1 signal intensity within the lesion representing the fatty and fibrous components, respectively.

BENIGN BONE TUMOURS

Enchondroma

Enchondroma (Figure 16) is the most common benign bone tumour of the hand, often asymptomatic and found incidentally on radiographs for an unrelated indication. Associated pain should raise concern for an underlying pathological fracture. Enchondroma in the hand is classically lobular in contour and associated with endosteal scalloping, commonly deep and associated with cortical thinning and a variable degree of bone expansion.[27] A ring and arc pattern of matrix may be present. Malignant transformation is rare but should be considered in cases of interval growth, local periosteal reaction or severe new pain.[28] In the long bones, the destruction of more than two thirds of the thickness of the cortex in a chondroid lesion would raise concern for underlying low-grade chondrosarcoma.[29,30] Multiple enchondromatosis, also known as Ollier's disease, typically demonstrates multiple enchondromas in the hand with deformity. The metacarpal bones are more frequently involved than the phalanges. Malignant transformation has been reported in 20% to 45.8% of pre-existing enchondromatosis cases and in 52% to 57.1% of patients with Maffucci's syndrome in a recent study.[31]

Osteochondroma

Osteochondroma is the most common bone tumour. Around one in ten occur in the small bones of the hands and feet.[28] It comprises cortical and medullary bone with overlying hyaline cap, often asymptomatic and an incidental finding on radiographs. Localised pain may be present due to irritation of adjacent structures. Radiographically (Figure 17), osteochondromas are seen as a bony exostosis continuous with the underlying parent bone cortex and medullary cavity and pointing away from a joint. There are two forms of osteochondromas radiographically, namely sessile and pedunculated. Osseous continuity in the sessile type of osteochondroma may be difficult to see on radiographs. Multiple osteochondromas in the hand and wrist region raises concern for underlying hereditary multiple exostosis.

Nora's Lesion

Nora's lesions, also known as bizarre parosteal osteochondromatous proliferations, are benign surface lesions of the small tubular bones of the hand. Nora's lesions typically involve the metaphysis or diaphysis of the phalanges and metacarpals. They are thought to

Figure 16. Enchondroma in a 59-year-old woman who presented with pain over the ring finger of the left hand after trivial injury: Frontal and oblique radiograph of the left hand showing a lytic expansile lesion over the metadiaphyseal region of the distal fourth finger with deep endosteal scalloping (arrow). There is associated pathological fracture.

Figure 17. Multiple osteochondromas in a 56-year-old man who presented with pain after trauma over the left forearm: Radiograph of the left forearm showing multiple bony outgrowths (arrows) over the proximal humerus, proximal ulna and distal radius, in continuity with the underlying bony cortex and medullary cavity and pointing away from joints. Associated reversed Madelung's deformity with shortening of the ulna and increased radial inclination (not shown).

be due to reactive heterotopic mineralisation arising from the periosteal aspect of an intact cortex, without involvement of the medullary canal.[28] Nora's lesions occurring under the nail bed are called subungual exostosis. Radiographically (Figure 18), Nora's lesions are seen as broad-based ossified juxtacortical lesions, without definite cortical or medullary continuation.[32] Periosteal reaction is usually absent. Radiographs alone are sufficient for diagnosis as they have a typical radiographic appearance.[28] Computed tomography (Figure 19) or MRI (Figure 20) scans are reserved for cases with inconclusive radiographic findings as they better demonstrate the relationship with underlying bone. Surgical excision is the treatment of choice but the recurrence rate is high at 50% to 55%.[33]

CONCLUSION

A variety of lesions may present in the hand and wrist region. Imaging plays an important role in their characterisation and diagnosis. Plain radiographs remain the first imaging of choice for patients with any complaints in the hand and wrist region, but has a limited role in soft tissue lesions. To investigate a soft tissue mass or swelling, ultrasonography can be initially employed to confirm the

Figure 18. Nora's lesion in a 41-year-old woman who presented with left little finger mass: Frontal and lateral radiographs of the left fifth finger show an ossified lesion over the dorsal aspect of the fifth proximal phalanx as indicated by the metallic marker, closely related to the underlying cortex.

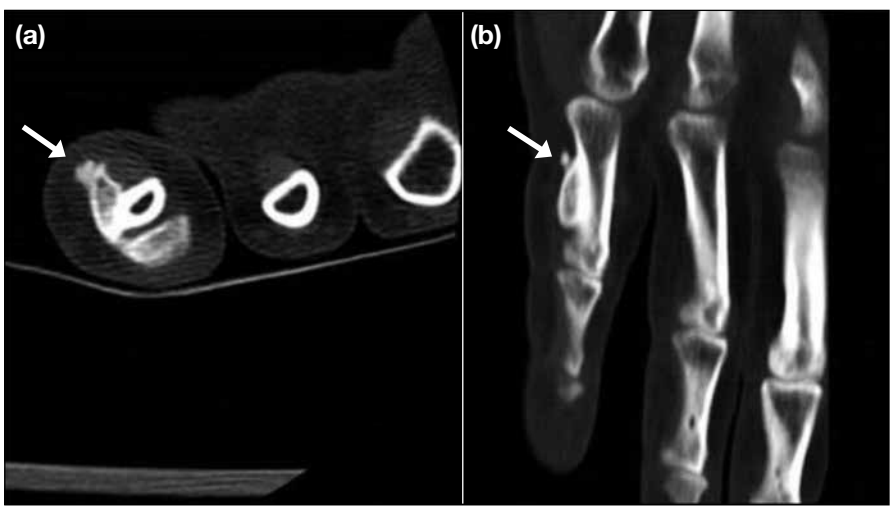

Figure 19. Computed tomography images belonging to the same patient in Figure 18. (a) Axial and (b) coronal computed tomography images of the left fingers showing the corresponding ossified lesion (arrows) as a broad-based juxtacortical lesion without medullary continuity.

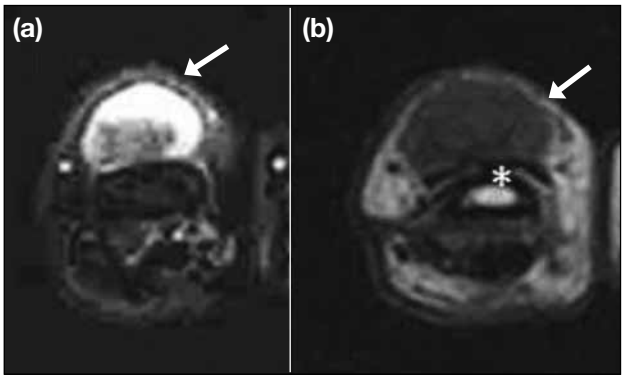

Figure 20. Magnetic resonance images in the same patient as Figure 18 and Figure 19. (a) T2-weighted fat-saturated axial magnetic resonance image of the left finger showing a lobulated lesion (arrow) over the dorsal aspect of the fifth proximal phalanx with heterogenous T2 signal intensity. (b) T1-weighted axial magnetic resonance image showing corresponding hypointense signal. Underlying hypointense cortical rim (asterisk) is intact.

presence of a mass lesion and differentiate cystic from non-cystic masses. Ultrasonography can also provide useful information about anatomical location, thereby narrowing the differential diagnoses. In general, MRI is the preferred modality to further characterise non-cystic masses. For osseous lesions, computed tomography and MRI are reserved for complex cases and/or when there is any doubt. Knowledge of their characteristic imaging features along with relevant clinical findings will enable the radiologist to make a correct diagnosis and avoid the need for invasive procedures. Some lesions have very similar imaging characteristics and biopsy is required to establish the diagnosis. Imaging guided percutaneous biopsy is commonly performed for pathological analysis. In particular, ultrasonography and computed tomography are often used for guidance. Overall, imaging plays an important role in the diagnostic workup of hand lesions. It also serves as a guide for subsequent management or surgical planning for clinicians.

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