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Ultrasound of wrist and hand masses

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KEYWORDS
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Abstract Ultrasound is a useful tool to investigate soft tissue masses in the wrist and hand. In most situations ultrasound helps distinguish between a cyst and a tissue mass. This article provides a simple clinical approach to the use of ultrasound imaging for the diagnosis and preoperative assessment of wrist and hand masses.

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Wrist and hand masses account for 12.8\% of soft tissue tumors [1]. Wrist and hand masses can be benign (76.5\%) or malignant (12.3\%) or can be pseudomasses (11.2\%) [1]. Clinical examination of the wrist, particularly palpation, can often reveal these swellings early and provide a straightforward diagnosis particularly in rheumatic disease, tenosynovitis or cysts. In these situations, imaging is only needed for pretreatment assessment, before infiltration or surgery. X-ray imaging (standard radiographs or even second line computed tomography [CT]) can show calcifications, ossifications or disease of adjacent bones (Fig. 1), which are often not visible on ultrasound [2]. X-ray imaging can also diagnose many swellings such as exostoses, Nora lesions, soft tissue chondromas when they are calcified and pseudomasses due to microcrystalline rheumatic disease or secondary to advanced arthropathy. It should therefore be performed first and is sufficient to reach the diagnosis in these situations. Ultrasound offers better spatial resolution than MRI, with the advantage of dynamic information regarding tendon movements and probe pressure

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to diagnose adhesions and analyze relationships with adjacent structures. Ultrasound is often criticized for being operator-dependent, but for the hand, wrist and particularly fingers, MRI is at least as operator-dependent: the need for powerful gradients and high resolution coils which are unfortunately not available on all machines and not easy to master (Fig. 2).

This article does not aim to provide an extensive description of hand and wrist tumors, from the most common to rarest one, but rather “putting them into perspective” to show how ultrasound can answer the three questions which arise for a surgeon faced with a hand mass.

A mass is palpable: is it a cyst?

Cysts account for 60% of hand masses [3,4] and are the most common and often the easiest ultrasound diagnosis. On ultrasound, cysts present as a mass with a typically anechoic echostructure and posterior echo enhancement, occasionally containing fine partitions and tiny echoes because of their frequent thick content (Fig. 3). There is no Doppler flow within these cysts except occasionally around their pseudocapsule, particularly if an inflammatory component or fissuring in the soft tissue makes them painful. Their most common location is the dorsal aspect of the roof or the radial artery groove although they may develop around most wrist and finger joints and also in the tendons or in the pulleys. Ninety-five per cent of cysts are typical in appearance on ultrasound [5,6] whereas 5% are atypical, occasionally more echogenic because of their hemorrhagic content (Fig. 4). It is then more difficult to confirm the diagnosis by ultrasound. In particular it is worth mentioning the lack of Doppler flow in a clearly delineated lesion or in avascular clots seen in a cyst, which is otherwise typical in appearance (Fig. 5). For cysts with atypical appearances, MRI with intravenous administration of a gadolinium chelate is needed to characterize these hemorrhagic masses, particularly using T1 and T2* weighted images which do not enhance with contrast. In answer to the question: “Is it

Figure 1. Digital tumor on ultrasound (a). Radiographs show bone disease, which was not visible on ultrasound (b). The combination of radiographs with ultrasound is essential in this case.

Figure 2. Giant cell tenosynovial tumor of the extensor tendon sheath of the finger (arrows): MRI (a and b) was obtained at 1.5T with a dedicated machine although the coil used, gradient, power and technical settings were not sufficient in the preoperative assessment supplemented by a higher quality ultrasound (c and d).
This mass is not a cyst: is it possible to characterize it?

Typical appearances

Some lesions have ultrasound appearances, which formally confirm the diagnosis.

Neuronal fibrolipoma

This is often called a hamartofibrolipoma and is a rare tumor of children or young adults involving proliferation of fatty and fibrous components contained by the epineurium which dissociates the neuronal bundles [8,9]. In the wrist and hand the lesion may affect the median or ulnar nerve or more distally to their distal dividing branches. The ultrasound appearance is generally that of dissociation of hypoechogenic nerve bundles due to hyper-echogenic fibrous fatty tissue within a thickened nerve (Fig. 7). On longitudinal views, the dissociated bundles are described as spaghetti-like in appearance. The combination of a hamartofibrolipoma with surrounding tissue hypertrophy (adjacent bone and soft tissue) provides a diagnosis of macrolipodystrophy.

Lipomas

These are clearly delineated masses consisting of mature adipocytes, which differ little from the surrounding fat. Although a lipoma is the most common soft tissue tumor, only 5% of lipomas of the arm are located in the hand [10] where they are found particularly in the thenar and hypothenar eminences and in the median part of the surface of the palm [11]. Patients are often middle aged (5th and 6th decades) and usually present with a soft consistency, slowly growing soft tissue mass, which is usually asymptomatic. The lipomas are usually elongated in shape and most are orientated in parallel with the skin surface. Their echostructure is similar to that of the subcutaneous fat, with a lobular appearance occasionally separated by hyperechogenic linear interfaces (Fig. 8). They are usually well delineated with no vascularized areas and ultrasound findings may then suggest that they are a simple lipoma. Well-differentiated liposarcomas, which are the main differential diagnosis, are very rare in the hand. In cases of rapid growth of atypical ultrasound appearance with a hard mass or deep location, MRI is a better tool to confirm that the lesion is fatty in nature and provide an accurate preoperative assessment.

Accessory muscles

These may resemble a tissue mass on ultrasound when seen along their short axis although the longitudinal section is typical of a fasciculated muscle structure. When these accessory muscles accompany a tendon, active or passive mobilization of the tendon is associated with synchronous movement of the adherent muscle structure (Fig. 9).

Subungal glomus tumor

This is a hamartoma developing in the glomus body, which is a neuromyoarterial receptor. It accounts for 1.2% of hand tumors and 65% of tumors in the subungual region and generally affects patients between 20 and 40 years old, with
Despite MRI usually ing occasionally located and chogenic particularly glomus more nail angiography [15].

Fig. 6. Typical tissue lesion on ultrasound: echogenic appearance of the lesion (*) in B mode (a) with central vascularization on power Doppler (b), easily distinguished from a cyst. The lesion is attached to the sheath of a flexor tendon (arrowhead). This is a giant cell tenosynovial tumor.

Fig. 7. Ulnar nerve fibrolipoma on MRI and ultrasound: a: T1-weighted MR image in the transverse plane and ultrasound: dissociation of the ulnar nerve bundles (arrow), thickened by a fatty tissue which is hyperintense on T1-weighted imaging and hyperchogenic on ultrasound. The bundles are hypoechogenic on ultrasound; b: longitudinal MRI T1-weighted view and ultrasound: ‘spaghetti-like’ appearance of the dissociated bundles (arrowheads).

A female predominance. Clinically, the lesion presents as a superficial red-blue nodule, which is usually painful, particularly with changes in temperature or pressure [12–14]. On ultrasound it mostly presents as a small, rounded lesion located beneath the nail bed, with a generally hypoechogenic structure, occasionally almost identical or slightly more echogenic than the nail bed. There is no visible capsule and some glomus tumors may be difficult to distinguish from the nail bed. They are often accompanied by bone scalloping on the dorsal aspect of the phalanx. These structures are usually hypervascular, with large vessels occasionally forming genuine pools on Doppler study in a nail bed which is naturally highly vascularized by narrower vessels (Fig. 10). Occasionally the tumor has a less vascularized center than the nail bed, with a small vascularized crown. If multiple glomus tumors are suspected, or if ultrasound is negative despite a strongly suggestive clinical examination, MRI using MRI angiography sequences is the most sensitive investigation [15].

Venous or arteriovenous malformations
These are benign vascular masses containing a variable amount of non-vascular tissue, mostly fat [16,17]. They are classified by type of vessel, which they contain. Small subcutaneous venous malformations often have a characteristic blue-colored appearance. Identification of complete vascular filling with slow venous flow in a well delineated, almost anechogenic structure, provides a formal diagnosis on ultrasound. They are often thrombosed and their contents may be echogenic, occasionally with some Doppler flow (Fig. 11). The diagnosis is then more straightforward clinically than on ultrasound. Large vascular malformations are straightforward to confirm in the presence of multiple compressible venous vessels, which fill on power Doppler. Flow analysis can determine whether the malformations are venous or arteriovenous nature.

The muscle hemangioma is a tumor often found in adolescents. On ultrasound muscle hemangioma presents with multiple hypoechogenic venous lakes infiltrating a muscle
Figure 8. Long digit lipoma: a: ultrasound shows a poorly delineated mass with echostructure similar to the subcutaneous fat and appearances of lobules, some separated by hyperechogenic linear interfaces (arrowheads); b: MRI confirms that the mass is hyperintense on T1-weighted image; c: fat saturated T2-weighted image confirms fatty mass.

Figure 9. Ultrasound appearance of an accessory extensor digitorum brevis manus: a: transverse view of the dorsal appearance of the hand shows a hypoechoic tissue structure; b: transverse view shows a typical fibrillary appearance of a muscle structure developing between the extensor tendons and representing an extensor digitorum brevis manus.

Figure 10. Subungual glomus tumor: a: B mode ultrasound shows hypoechoic nodule (*) causing bony scalloping on the phalanx (arrow); b: on Doppler mode ultrasound; the mass displays incomplete hypervascularization but with wider vascular areas different from the vessels of the naturally hypervascularized nail bed; c: T1-weighted MR image obtained after intravenous administration of a gadolinium chelate shows bony scalloping (arrow). The glomus tumor (*) shows marked enhancement.
and filling on Doppler, particularly by opening and closing the fist repeatedly and almost completely collapsing on pressure from the ultrasound probe. Other small perivascular tumors such as angiomyomas (or angioleiomyomas) or some soft tissue glomus tumors do not have typical ultrasound features. These are small tissue masses, which are vascularized on power Doppler ultrasound and require histological diagnosis.

Aneurysms or thromboses of the wrist and hand arteries
These are found in typical locations and are straightforward to diagnose on Doppler ultrasound, particularly the hypothenar hammer syndrome, which is microtraumatic in origin and occasionally presents as a mass along the path of the ulnar artery (Fig. 12) or thrombosis of the radial artery after a local procedure (puncture, resection of a cyst or a vascular procedure).

Foreign body granulomas
The diagnosis of foreign body granulomas is straightforward when the foreign body, which is generally hypoechogenic on ultrasound or hypoattenuating on CT, is seen in the center of a hypoechogenic granulomatous nodule (Fig. 13).

Typical or suggestive sites
Although ultrasound features are not formally diagnostic, the actual diagnosis can be suggested by lesion location and patient clinical history.

Palmer fibromatosis or Dupuytren’s contracture
This is a multinodular fibro- and myofibroblastic proliferation thickening of the superficial palmer aponeurosis and its expansions to the fingers [18] and has an incidence of 1 to 2% in the general population, with a clear male predominance. The ultrasound appearance of fibrillar thickening of the superficial palmer aponeurosis in longitudinal sections with digitations towards the flexor tendons (Fig. 14) confirms the diagnosis.Appearances mimicking an additional superficial flexor tendon (Fig. 15) provides a formal diagnosis of this very specific disorder, particularly at the base of the long fingers.

Figure 11. Large venous malformation of the palm of the hand: a: on MRI and b: Doppler ultrasound, the malformation presents as a mass containing many winding hypoechogenic structures, which can be compressed by the probe and represent slow flow vessels on color Doppler.

Figure 12. Ultrasound shows thrombosis of an ulnar artery pseudoaneurysm in hypothenar hammer syndrome (arrowheads).
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Figure 13. Swelling of the 3rd commissure due to a granuloma, which is poorly delineated and hypoechogenic (*) reactive to a plant hyperechogenic plant foreign body (arrowheads).

Figure 14. Dupuytren’s contracture. Ultrasound examination in the transverse plane. (a): hypoechogenic swelling developing next to the superficial palmer aponeurosis extending internally to the tendon sheath, the ultrasound appearance of which is fibrillar and digitiform in many places on the sagittal views; b: diagram: the Dupuytren’s in green on the diagram: flexor tendons in grey.

Figure 15. Dupuytren’s contracture, transverse view (a): appearance mimicking a supernumerary tendon (in green on the diagram b) superficial to the flexor tendons (in grey on the diagram).

Tenosynovitis
Tissue thickening of a tendon sheath firstly suggests tenosynovitis, particularly if it affects the whole length of the tendon sheath and is accompanied by a small effusion in the sheath. Investigation for rheumatic, infectious or microcrystalline disease generally confirms the diagnosis. Involvement of the flexor carpi radialis tendon sheath can mimic a radial arterial groove cyst in tenosynovitis, which is often associated with disease of the scapho-trapezoid joint in articular chondrocalcinosis.

Giant cell tenosynovial tumor
This can occasionally take on the appearance of diffuse inflammatory tenosynovitis (Fig. 16). Generally, however, it involves a nodular tumor-like structure developing against a flexor or extensor tendon. It is the second most common

Figure 16. Giant cell tenosynovial tumor of the flexor tendons of an index finger. The disease is diffuse along the whole length of the tendon sheath (*), which may mimic inflammatory tenosynovitis. The clinical context however was not suggestive of rheumatoid disease.
tumor after cysts. Although the diagnosis is strongly suggested by the frequency and site of the tumor in contact with the sheaths, the diagnosis can only be formally confirmed by histopathological examination as some very rare malignant tumors can have similar appearance and location. Tendon sheath fibromas are rarer and have an ultrasound appearance similar to those of giant cell tenosynovial tumors [19].

**De Quervain tenosynovitis**

Some stenosing tendinopathies such as de Quervain tenosynovitis [20], can mimic tumors, although the pseudonodular thickening of the retinaculum which loops around the tendons can easily resolve the diagnosis.

**Others**

Some tendon ruptures such as rupture of the flexor carpi radialis tendon may be symptomatically silent and present as a mass in the palmer surface of the wrist, mimicking a cyst, which in fact represents the retracted tendon stump (Fig. 17). The diagnosis is straightforward on ultrasound.

![Figure 17. Rupture of the flexor carpi radialis (FCR) tendon. The patient presented with a suspected radial artery groove cyst. Sagittal ultrasound clearly shows that the mass palpated represents the stump of the retracted FCR tendon (arrowheads).](image)

Subcutaneous nodular thickening of the dorsal aspect of a finger at the level of a proximal interphalangeal (PIP) joint can suggest several diagnoses, including fat pad disease (multiple lesions and in the context of Dupuytren’s contracture), a rheumatoid nodule (in the context of advanced rheumatoid arthritis) or a giant cell tenosynovial tumor. The diagnosis can only be guided by the clinical context as the ultrasound appearance of these conditions is not specific (more or less well delineated hypoechoic nodules). In the absence of an obvious context, histology is required (Fig. 18).

Some synovial thickenings can occasionally appear as a soft tissue mass. Hypoechoic thickening of the synovium should suggest rheumatic or microcrystalline disease, particularly if the involvement is diffuse. The synovial disease in arthritis is generally non-specific. Hyperechoic deposits within a thickened synovium should suggest microcrystals (gout, chondrocalcinosis) and one or more calcifications present in the tendon sheath should suggest primary osteochondromatosis or secondary to longstanding arthropathy. The diagnosis can generally be made from radiographs. Joint involvement from villonodular synovitis is rare in the wrist (2% of all lesions) [21]. This tumor consists of supporting cells, fibrous tissue, giant cells and hemosiderin following repeated hemorrhage and generally occurs in adults between 30 and 40 years old. Its ultrasonographic appearances are relatively non-specific (hypoechoic synovial thickening) and MRI can provide better definition of the lesions through T2*-weighted gradient echo images that show hemosiderin.

Tumors containing calcification should be distinguished from hydroxyapatite deposits (Fig. 19). X-ray or CT are essential in this situation if not performed before ultrasound and occasionally guide towards new views or CT if the calcifications are not visible on standard views. Tumors containing a calcium component include calcified soft tissue chondromas (Fig. 20), articular or tendon sheath osteochondromatoses and hemangiomas (phleboliths). Ultrasound is an ideal complement to radiographs and can suggest the diagnosis (Fig. 21) by locating the calcium structures with

![Figure 18. Example of three patients with the swelling of the dorsal aspect of the fingers next to the interphalangeal joints. Without the clinical context these structures are similar and are non-specific; a: rheumatoid nodule; b: fat pad disease associated with Dupuytren’s contracture; c: giant cell synovial sheath tumor.](image)
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Figure 19. Hydroxyapatite calcification. Painful soft tissue mass investigated by ultrasound (a). Transverse view of the MCP shows calcification against the A1 pulley and the flexor tendons. The postero-anterior radiograph (b) confirms that this is a hydroxyapatite calcification (arrowhead).

Figure 20. Ossified soft tissue chondroma that was histopathologically confirmed. Isolated ossification located outside the tendon sheath on ultrasound is suggestive for the diagnosis.

Figure 21. Primary osteochondromatosis. Calcification in an interphalangeal joint was not seen on X-rays. The joint synovium is thickened on the palmer aspect of the joint.

respect to anatomical components (sheath, joint and soft tissues).

Neurogenic tumors and pseudomasses typically develop in a nerve (Fig. 22). The connecting angle between these tumors in the nerve is obtuse whereas a tumor, which causes extrinsic nerve compression has an acute connecting angle with the nerve. Schwannomas can occasionally be distinguished from neurofibromas if the displaced nerve is visible peripherally. The clinical history and site can easily distinguish these tumors from micro-traumatic neuromas or neuromas secondary to an injury (Fig. 23).

Figure 22. Ulnar nerve schwannomas: a: longitudinal ultrasound showing a hypoechoic tissue mass (*) on the path of the ulnar nerve. The obtuse connecting angle with the nerve (arrow) confirms the diagnosis of a neurogenic tumor; b: the ulnar nerve is laminated (arrowheads) by the tumor (*) which has developed peripherally to it. This appearance is suggestive of a schwannoma.
Sites, which would suggest a more common diagnosis. These rare malignant tumors include epithelioid sarcoma, which affects the fingers and hand in over 60% of cases, myxoinflammatory fibroblastic sarcoma, which is often located in the fingers and may mimic an atypical synovial cyst. If doubt is present about an aggressive lesion MRI should be performed with intravenous administration of a gadolinium chelate for a reference assessment. Histopathological analysis in a specialist centre belonging to the Netsarc network should also be considered [22].

Surgery is being planned: where is the mass located and where does it arise from?

General details

Ultrasound can inform the surgeon about relationships between the mass and adjacent structures and may be sufficient for the preoperative assessment provided that the mass is not too closely related to bone or joint with a tissue swelling, that the mass is not too bulky or infiltrating and that it does not lie too deep (carpal tunnel, floor of the palm).

Non-specific tissue mass

Extreme caution is required for a non-specific soft tissue mass with no suggestive features from clinical findings or site of the lesion and no presumptive diagnosis should be made. Malignant or aggressive tumors in this region are certainly very rare although they need to be considered, particularly if the lesion is bulky (Fig. 24) or is not located in any of the sites, which would suggest a more common diagnosis. These rare malignant tumors include epithelioid sarcoma, which affects the fingers and hand in over 60% of cases, myxoinflammatory fibroblastic sarcoma, which is often located in the fingers and may mimic an atypical synovial cyst. If doubt is present about an aggressive lesion MRI should be performed with intravenous administration of a gadolinium chelate for a reference assessment. Histopathological analysis in a specialist centre belonging to the Netsarc network should also be considered [22].

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Surgery is being planned: where is the mass located and where does it arise from?
In these cases MRI should be used in addition to or replace ultrasound in a preoperative anatomical assessment. Similarly, bulky vascular malformations or muscle hemangiomas should be investigated by MR angiography or even occasionally by CT angiography particularly for rapid flow.

The ultrasound report for a preoperative assessment should ideally contain a drawing explaining the relationships between the lesion and adjacent structures (nerve vessels, joint tendon sheath, nail matrix and bed).

**Specific situations**

Specific anatomical descriptions are required for some tumors.

**Cysts**

Firstly, wherever possible, the origin of the cyst and presence or absence of a pedicle should be described. The majority of cysts of the dorsal aspect of the carpal bones arise superficially from the dorsal portion of the scapho-lunar ligament. Radial artery groove cysts develop on the palmer aspect of the wrist and in contrast have a variable pedicle which generally arises from the radio-carpal joint line next to the palmer portion of the scapho-lunar ligament although may arise from many joints on the palmer aspect or occasionally even from the dorsal aspect of the carpal bones through a long pedicle. Ultrasound is particularly valuable for these palmer cysts, allowing the surgeon to resect the cyst including the pedicle [7].

**Mucoid pseudocysts**

For cysts on the dorsal aspect of the distal interphalangeal joint, the report should state whether this develops from an osteoarthritic distal interphalangeal joint and where its pedicle is in relation to the extensor tendon. It should describe whether it has developed beneath the nail plate or in the dorsal fold of the plate (Figs. 25 and 26) and also whether or not it comes into contact with the matrix lesion located at the beginning of the nail and often responsible for a stria on the nail plate [7].

**Giant cell tenosynovial tumor**

This also requires a detailed description of the relationship between the mass and the tendon and adjacent vasculo-neuronal structures. It must be investigated for multiple involvement along the path of the tendon sheath. Any bone scalloping or erosion (present in 10% of cases) or contact with a joint requires additional MRI (Figs. 27 and 28).

**Nerve division neuroma**

The concept of continuity of the nerve is fundamental and should be reported anatomically with measurements following an open wound.

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**Figure 25.** Mucoid pseudocyst, developing in the subungual region: diagram (a) and dorsal sagittal ultrasound view (b) of a vermicular pseudocyst (*) developing subungually (arrow = nail plate) under the ventral matrix. Access beneath the matrix is more difficult for the surgeon.

**Figure 26.** Diagram (a) and sagittal ultrasound view; b: the cyst is located superficially to the base of the nail and nail plate (arrowhead) in the proximal nail recess (arrow); c: on a sagittal view, the cyst is in contact with the nail matrix (arrow); d: on a more distal axial view note the stria visible on the nail plate on the axial view as a concave area (arrow).
Figure 27. Giant cell tenosynovial tumor: a: ultrasound shows close contact with the joint (arrow); b: fat-saturated T1-weighted MR image in the coronal plane obtained after intravenous administration of a gadolinium chelate shows minimal joint invasion (arrow).

Figure 28. Giant cell tenosynovial tumor of the sheath of an extensor with joint and bone invasion: a: ultrasound does not show the joint and bone disease; b: joint and bone disease is seen on radiograph; c: preoperative assessment should therefore be complemented by MRI, which shows the extent of bone involvement.

Damage to the long fingers from Dupuytren’s contracture

The relationships with the collateral vascular and neuronal bundles, which may become rolled around the fibrous cord and cause surgical difficulties should be described [23,24].

Nail bed glomus tumors

The report should provide a detailed topographic description with a diagram of the nail bed describing the relationships to the lateral edges to which the tumor may extend [25].

Conclusion

Ultrasound is the ideal tool for the first line investigation of wrist and hand masses because of its ability to distinguish between a simple cyst and a tissue lesion without the need for contrast enhancement. It is generally sufficient preoperatively for cysts or relatively superficial, small, well-delineated masses, which are often the case at this site. It should always be combined with a standard high quality radiology assessment. The site and some of the features generally suggest or confirm the diagnosis. In atypical, poorly delineated deep tissue sites or appearances, which scallop or erode the bone or become interwoven with a joint, MRI is required either initially or after ultrasound.

Take-home messages

- Ultrasound is the most simple tool to diagnose a wrist cyst provided that the cyst is typical in appearance (anechogenic with posterior enhancement).
- If an atypical cyst is suspected MRI is required.
- Preoperative investigation for the source of a palmer cyst is required as its pedicle may be very variable in location
- Some masses are typical on ultrasound appearance (Dupuytren’s contracture, neuronal fibrolipoma or accessory muscle, etc.) or are in a suggestive site (neuronal tumor, glomus tumor, etc.).
- For tissue tumors, which are atypical in site or appearance and poorly delineated and deep, scalloping or eroding the bone or becoming interwoven with a joint, MRI is required either initially or after ultrasound.
- If appearances are not typical the final diagnosis can only be provided by histology.

Clinical case

This 65-year-old man has a hard fifth finger swelling with difficulty for extension. An ultrasound was performed (Fig. 29).
Questions

1) Describe the abnormalities seen on this ultrasonographic examination.

2) Among the following items, which is the most plausible diagnosis?
   a) Schwannoma
   b) Dupuytren’s contracture
   c) Neuraoma
   d) Neurinoma
   e) Collateral artery thrombosis

Answers

1) The swelling has developed around the ulnar collateral vasculoneuronal bundle of the fifth digit and is hypoechoic and relatively well delineated on the axial view. On the longitudinal view the appearance is of a structure parallel to the flexor tendons, which has a fibrillary appearance mimicking another tendon. This appearance is typical of Dupuytren’s contracture in a more distal digital form than the disease, which usually develops in the palm of the hand.

2) Dupuytren’s contracture.

Disclosure of interest

The authors declare that they have no competing interest.

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