

Inside Story HIGHLIGHTS

From the Pacific Radiology Referrer Newsletter



Pacific Radiology

Ultrasound of Peripheral Nerves

Ultrasound has come a long way since the days of arcane, artefact-ridden images comprehensible only by those with sufficient imagination (Could that be the pancreas down there – somewhere?). Nowhere is this more evident than in musculoskeletal work where advances in transducer technology now allow exquisite demonstration of superficial structures. Muscles, tendons, nerves – ultrasound and MRI demonstrate with elegance those tissues formerly dismissed by radiologists as ‘soft tissue’. We have a whole lot more anatomy to learn than in the good old days.

The major nerves of the arm are particularly accessible to ultrasound. Medial, radial and ulnar nerves are relatively superficial throughout their lengths and can be traced along common sites of compression. Best known is the carpal tunnel but the median nerve may also be compromised in the upper forearm; the ulnar nerve at the elbow or wrist. In the leg, the common peroneal nerve is readily visualised as it winds around the fibular neck; the posterior tibial nerve can be followed through the tarsal tunnel. The tunnel syndromes typically result in a swollen, hypoechoic nerve with or without increased vascularity on Doppler. Other causative or contributory factors can be demonstrated; an adjacent mass, most commonly a ganglion, may compress directly or have a space occupying effect within a tunnel. Less common causes of mass effect include tenosynovitis, accessory muscles and neoplasms.

Peripheral nerve trauma is frequently iatrogenic, seen post-operatively or following invasive procedures such as angiography. Ultrasound is able to show nerve transection, traumatic neuroma or compression by haematoma.



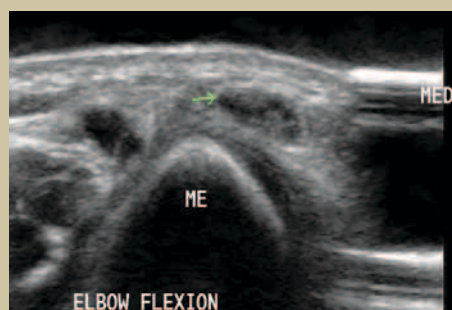
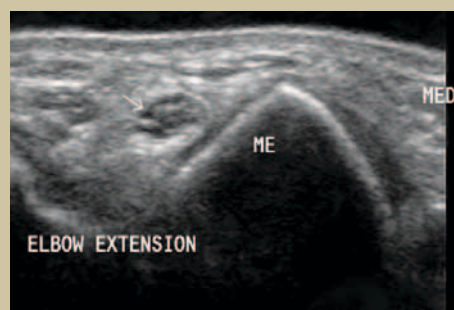
Peter Bellamy

Nerve tumours are uncommon, usually benign and may present as a palpable mass with a positive Tinel sign. Differentiation between neurofibroma and schwannoma is unreliable but the continuity of these lesions with normal nerve can be beautifully visualised.

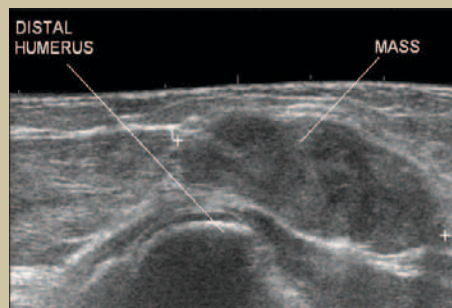
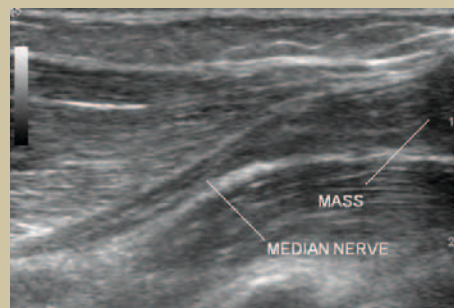
So where does sonography fit in with other methods of investigation? MRI has the advantage in deeper structures. Nerve conduction studies are well established but have a significant false negative rate; imaging may be needed to determine the exact site and cause of conduction abnormalities. As usual the answer is that these tests are complementary and, while the need for investigation of a clinically obvious carpal tunnel syndrome is questionable, a combination of studies may be required in more difficult cases.

Ultrasound is quick, inexpensive, non-invasive and readily available. It has become an excellent tool in the investigation of focal peripheral nerve lesions.

~ Peter Bellamy



Dislocating ulnar nerve at the elbow. On flexion the nerve (arrowed) is seen to move from the cubital tunnel to the medial aspect of the medial epicondyle (ME). The nerve is normal in appearance. The condition may be asymptomatic.



Median nerve tumour in the antecubital fossa – histology not yet available. Continuity with the normal nerve is demonstrated.