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Is It a Central or a Peripheral Wrist Drop?

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Dear Sir,

Wrist drop is a common presentation to the emergency department and often a cause of confusion to non-specialists. It is crucial, however, to differentiate between central and peripheral causes of wrist drop, given the difference in the diagnostic approach, management, rehabilitation, and prognosis.

The onset of weakness can be helpful as strokes would be expected to cause a sudden loss of function. However, the acute onset may not always be recognised by patients, particularly if the deficit is mild, affecting the non-dominant hand, or when stroke occurs during sleep. CT perfusion is a useful technique for measuring cerebral perfusion, which can additionally be used to distinguish between ischaemic stroke and stroke mimics[1], though it has limitations in patients with small infarcts as these can easily be missed. Therefore, it is important to distinguish clinically between strokes and wrist drop related to a radial nerve palsy. In this text, I will discuss the importance of synkinetic wrist extension as a useful clinical method in this context.

The manoeuvre described by Brigo and colleagues, where patients are asked to make a fist is an easy to perform and very effective method for distinguishing central from peripheral causes of wrist drop[2]. Furthermore, it does not require extensive knowledge of the radial nerve sensory or motor functions. Worsening of the wrist drop is more likely to happen in patients with radial palsy, while a slight elevation of the clenched hand would be expected in patients with a stroke affecting the hand motor cortex.

Conversely, radial nerve palsy might sometimes be mistaken for a stroke. This may lead to introduction of unnecessary risky treatment (e.g. thrombolytic therapy) or injudicious use of the already limited resources such as occupying beds in the acute stroke units whilst waiting for an MRI scan, which may take days in the small district hospitals.

We have observed a common mistake encountered by junior doctors when they examine patients with wrist drop. They often fail to recognise the importance of stabilising the wrist and thumb to properly assess the strength of other muscles supplied by the median or the ulnar nerve[3]. This may lead to an apparent ulnar and median nerve involvement in patients with radial palsy and divert the thinking process towards mononeuritis multiplex, brachial plexopathy, polyradiculopathy or a cortical hand.

Some movements require a coordinated action of many muscles that are not supplied by the same peripheral nerve. Hence, the weakness of one muscle may affect the action of other muscles and this phenomenon can explain the apparent weakness of ulnar and median motor functions in patients with radial palsy. To eliminate this effect clinicians should isolate the muscles being tested.

Placing the hand on a hard surface prior to examining ulnar and median nerves motor function is crucial to minimise the effect of the weak extensors related to radial nerve dysfunction, enabling a correct answer to the traditional question "where is the lesion?" before moving on to investigate the cause of the lesion and manage patients appropriately.

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