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The scaphoid fracture: missed too frequently

When scaphoid fractures are missed, the consequences for patient and clinician may be considerable. This may be as a consequence of nonunion and if so, reconstructive surgical fixation often with bone grafting may be required. Other longer-term implications such as post-traumatic osteoarthritis (often referred to as scaphoid nonunion advanced collapse – SNAC wrist) may necessitate salvage surgery such as partial or total wrist fusion. In either of these circumstances the cost to the individual for their employment and to the wider health economy will be keenly felt.

This article is intended to bring together some of the recent relevant literature on the missed scaphoid fracture and to present a current medico-legal case which illustrates the importance of repeated examination, good records and keeping the possibility of a scaphoid fracture in mind.

Wrist pain after injury is very common. The fall onto the outstretched hand is the most typical method of injury, but a direct blow to the hand, such as from a football, may provide sufficient force to fracture the scaphoid. All medical staff in contact with such patients, whether in Minor Injury Units (MIUs), Emergency Departments (EDs), GP surgeries or other primary care providers, need to have high clinical suspicion and must maintain good examination records. The key examination points of the painful wrist should document anatomical snuffbox tenderness (ASB), longitudinal compression of the thumb (LTC), scaphoid tubercle tenderness (STT) and painful ulnar deviation of the wrist (PUD).[1] Each of these examination points has their own sensitivity and specificity for the detection of a scaphoid fracture, and prompt detection of this injury will allow rapid immobilisation of the wrist leading to a high chance of fracture union. Clinical pathways combining examination findings can diagnose acute scaphoid fracture with 100% sensitivity and 74% specificity if performed within 24 hours of the injury.[2]

Early definitive diagnosis should not only prevent missed scaphoid injury but also prevent overtreatment for those patients who are wrongly assumed to have a scaphoid fracture. Overtreatment has inconvenience, work absence and cost implications, either in terms of excessive immobilisation in a cast or when CT/MRI scanning is delayed. The continuing prevalence of the 'scaphoid cast' is also unnecessarily disabling when simple forearm casting has been shown to be equally effective. A recent multicentre study[3] showed no benefit of including the thumb in the cast which patients would be grateful for; thumb immobilisation is extremely inconvenient when trying to perform simple daily activities.

In 2012 Khan et al documented the steep rise in National Health Service Litigation Authority (NHSLA) claims in orthopaedic surgery between 1995 and 2001, and their literature search found the most common reasons for negligence claims being settled over a six-year period were a post-operative complication or an incorrect, delayed or failed diagnosis.[4]

Harrison and colleagues, in their 2014 article, highlighted the litigation cost of negligent scaphoid fracture management in the UK. In this short report the NHSLA was asked to supply all orthopaedic-related litigation between 1995 and 2010 in England and Wales. Of the data, 101 of 9865 (0.01%) medico-legal claims were attributed to mismanagement of scaphoid fractures, with a mean litigation cost of £41 680 per case. The largest costs occurred when there was a combination of failed diagnosis and a delay in initiating appropriate management, especially when follow-up was poor.[5]

Ring et al have reviewed 17 years of data from NHSLA litigation dating from 1995 to 2012 in the greatest depth to date. Over half (68%) of all scaphoid fracture claims were lost at a total cost of £3 451 100. The single highest settlement of £600 100 related to negligent performance of bilateral scaphoid fixation leading to permanent disability. The majority (77%) of claims related to delay in diagnosis.[6] It is likely that there are many more cases of failed diagnosis which never reach litigation.

While patients may complain of wrist pain at presentation to an ED or their GP, there are occasions when patients do not complain of wrist symptoms such as when consciousness is impaired resulting from alcohol or drug intoxication, or after multiple injuries. In both of these circumstances a 'secondary survey' is required specifically to look for scaphoid injury and, if necessary, a temporary wrist brace/cast should be applied until definitive imaging can be performed. Such an example is given below from an ongoing clinical negligence case:

"Mr M is a 50 year old executive who was brought to ED after an RTC [road traffic collision] when he was thrown from the motorcycle which he was riding caused him to cartwheel 50 m along a main carriageway. He was taken to ED by ambulance and assessed for multiple

injuries. Although he complained of multiple painful areas there were no long bone fractures identified and a CT chest/abdo/pelvis showed no internal injuries. He was discharged to his home area two days later with 'total body pain'. Despite repeatedly complaining to a variety of GPs and a physiotherapist of wrist pain it was not until six months later that the clinical suspicion of a scaphoid fracture was made. A subsequent radiograph showed a scaphoid nonunion and internal fixation with bone grafting is scheduled. He has been unable to work since the RTC because of his wrist complaint."

It therefore behoves all clinicians to revisit the evidence behind our decision-making when presented with post-traumatic wrist pain and to repeat examinations using agreed examination techniques (ASB & ST tenderness, painful LTC of thumb, and PUD) to ensure other clinicians have not previously missed an acute scaphoid fracture. Emergency and Minor Injury departments should have agreed protocols for managing patients presenting with acute post-traumatic wrist pain, especially if initial plain radiography is negative. While follow-up radiographs taken seven to 14 days after wrist injury have been popular for many years in order to try and identify an occult scaphoid fracture, modern imaging techniques provide more certainty in the diagnostic pathway. The use of early MRI scanning has been shown to be cost efficient, and provides the opportunity to remove the cast at an early stage if the scaphoid is uninjured. In addition, MRI may show injuries to ligaments, other carpal bones or the distal radius directing alternative treatments.[7] Furthermore, the American College of Radiologists suggest an MRI without contrast is the investigation of choice for the suspected scaphoid fracture with normal initial radiographs.

The current UK SWIFFT trial (Scaphoid Waist Internal Fracture Fixation Trial) is aimed at answering the question of best fracture union rates between cast treatment compared with early operative fracture fixation within two weeks. This trial also encourages UK centres to concentrate surgical expertise by specialist hand surgeons. However, patients with scaphoid fractures will continue to present initially to a wide variety of clinicians before they are referred to hand surgeons. This risks preventable delay in diagnosis if guidelines for optimal management are not followed.

Although increasing emphasis is being placed on reducing risk in orthopaedic practice, the scaphoid fracture is an injury which needs to be reliably diagnosed early in order to reduce the possibility of long-term disability and also the possibility of litigation. Each centre in the UK providing a scaphoid fracture fixation service should be encouraged to draw up local guidelines for the management of the patient with a painful wrist after injury.

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