

Has NICE guidance changed the management of the suspected scaphoid fracture: A survey of UK practice

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Introduction

The scaphoid is the most commonly fractured carpal bone, accounting for between 60 and 79% of carpal fractures.¹ Fractures are only seen in about 12.4 patients per 100,000 population in UK,¹ but the poor positive predictive value of initial imaging results in a fivefold overtreatment. Importantly, physically and socio-economically active people are the ones most commonly affected and this overtreatment results in significant utilisation of NHS resources.²⁻⁵ This strategy has been considered necessary to avoid the well-recognised complications of scaphoid fractures which include long term morbidity as a result of non-union, osteoarthritis and avascular necrosis. These issues are exacerbated by fracture location, displacement and delay in diagnosis (beyond 4 weeks).⁶ Despite the strategy for overtreatment, missed or delayed diagnosis of scaphoid fracture is a key area for litigation against the NHS.⁷⁻⁹

Clinical examination of the scaphoid has a poor specificity for fracture detection¹⁰ and diagnosis relies on imaging, most commonly, with initial and follow-up X-rays. Investigation of a number of imaging modalities has been widely researched over the last decade and has confirmed high sensitivity and specificity values for Nuclear medicine (NM), magnetic resonance imaging (MRI) and computed tomography (CT) in comparison with the poor sensitivity of X-rays.¹¹⁻¹⁵ MRI and CT are relatively comparable,¹³ but MRI has the advantage of avoiding exposure to ionising radiation, and superior sensitivity for detection of other bony or soft tissue injuries. In contrast, CT is a rapid and more readily available examination with optimum bone demonstration and images can also enable assessment of fracture characteristics to aid surgical planning.¹⁶ New cone beam CT (CBCT) imaging equipment, designed specifically for the extremities may provide a disruptive technology at low radiation dose with reduced cost and easier access.¹⁷⁻²⁰ Additionally, ultrasound^{21,22} and tomosynthesis²³ have been proposed as a low cost and readily access screening tools. Ultrasound can identify soft tissue swelling and effusion,²² but the limitation is its focussed nature (single bone).

Despite guidance and the scientific literature championing the benefits of early and accurate diagnosis (or exclusion) of such injuries, the implementation of such practice is not clear. UK and international surveys²⁴⁻²⁶ show that X-rays (typically a 4-view series) remain the primary

imaging tool, with inclusion of other modalities only late in the diagnostic pathway consistent with Royal College of Emergency Medicine (RCEM) guidance.²⁷ In 2016 The National Institute for Health and Care Excellence (NICE) published guidance on imaging for the suspected scaphoid fracture.²⁸ They concluded that MRI should be considered for first-line imaging but the feasibility of translating the guidance into practice has been questioned.²⁹ The only previous UK survey²⁶ conducted since the NICE recommendations on scaphoid imaging was of a self-selected group of radiologists and therefore contemporary clinician experience of the management of such injuries is required. This article reviews current UK healthcare delivery to establish whether the NICE guidelines have driven a change in practice.

Method

This was a cross-sectional electronic survey of UK emergency departments (ED) which sought information regarding their local clinical pathway for suspected scaphoid fractures. Hospital sites with emergency or urgent care provision were identified from UK home countries government and NHS statistics websites (n=166). In addition, to maximise participation, the survey was publicised through emergency medicine networks, including the RCEM research website and the English Injuries and Emergencies NIHR (National Institute for Health Research) Clinical Research Networks Leads.

The electronic survey was developed using an online tool (Online Surveys, Jisc, Bristol, UK). To ensure that the required information was obtained from respondents, the questionnaire was designed by a multi-disciplinary team. To ensure the ease of survey completion the majority of the 20 survey questions were forced response, with the opportunity to provide a greater depth of information where appropriate. The survey was piloted before distribution on a small number of ED clinicians, which confirmed the question appropriateness, legibility and structure.

An initial invitation (and flyer for informal circulation) was distributed by post to each UK NHS Trust 'Emergency Department Clinical Lead' in January 2019. This provided details of the project and survey web link and requested that a relevant clinician answer the questions. The invitation also informed potential participants that the name of the

responding site would be required to identify duplicate responses, otherwise no personal identifiable information would be requested, and confidentiality was ensured. No incentives were offered for survey completion. Participant information was provided on the opening page of the electronic survey and the first question asked potential respondents to affirm their consent to participation and dissemination of the anonymised results. Following the initial invitation letter, a reminder mailing was initiated at two months to non-responding sites and further regional mailings were undertaken in conjunction with the research network leads. The response data was downloaded into Microsoft Excel® (Microsoft Corporation, USA) for analysis.

Results

A total of 76 responses were received within the timeframe. These included a small number of duplicate submissions and following validation a response rate of 39.8% was achieved (n=66/166). Most organisations (83.3%) have guidelines for the management of suspected scaphoid fractures. Seven sites (10.6%) have the support of a 7-day immediate reporting service for X-rays, with more offering a service Monday-Friday (n=19/66; 28.8%) and a number having ad hoc provision (n=18/66; 27.3%).

In relation to the imaging of suspected scaphoid fractures, all responding sites perform an X-ray as the first-line examination. If this is normal the majority (n=36/66; 54.6%) go on to see the patient again in an ED clinic, usually at 10-14 days (Figure 1). Fracture clinic referral is the most common alternative strategy (n=26/66; 39.4%) with half of these utilising virtual clinics, however one site manages these in a specialist hand clinic. Only two respondents indicated they refer for cross-sectional imaging without a further follow-up clinical review.

One hospital reported that they discharge all patients following a normal X-ray with a splint and advice to self-refer to ED clinic if still symptomatic at 2 weeks. This has proved successful and was:

... instituted as a quality improvement project in February 2018. It has been closely audited and found to be safe in terms of not missing any fractures. It has also greatly reduced ED clinic use and unnecessary repeat imaging.

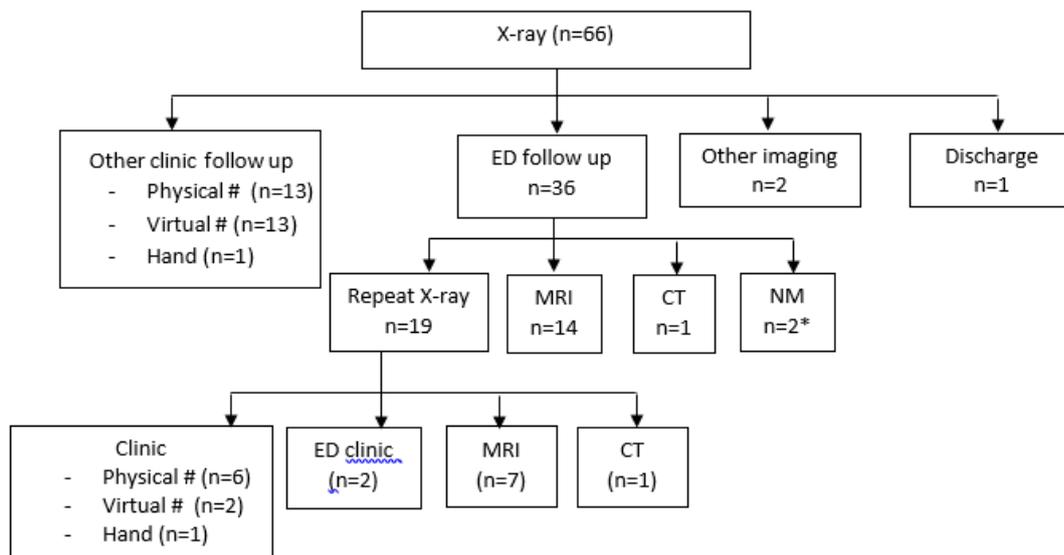
For those reviewing patients in an ED clinic, a repeat X-ray is the most common strategy (n=19/36; 52.8%) if the clinical assessment confirmed they were still symptomatic. There was further inconsistency in how to proceed if this X-ray is normal (Figure 1). Rather than repeat the X-ray almost half of sites proceed straight to complex imaging at this stage (n=17/36; 47.2%), with most opting for an MRI scan but CT and nuclear medicine are used in a number of sites. However, there is inconsistency in this strategy, even at a site level with respondents stating:

“... There is variation in practice between ED Consultants, some go straight to MRI at 10-14 days”

“... Some colleagues offer MRI and continue with a splint, some place the pt in a cast and review after 4 weeks. Of the latter, if the patient remains sore at that point then an MRI is organised”

“MRI requested. MRI or CT performed (at discretion of radiology).”

Figure 1: Management of patients with suspected scaphoid fracture but normal imaging



Key
 # Fracture
 CT - Computed Tomography
 MRI - Magnetic Resonance Imaging
 NM - Nuclear medicine (bone) scan

Managing the ED patient following complex imaging scans is also not straightforward (n=25/66), regardless of the timing of the investigation. Only two sites (8.0%) receive an immediate report on their MRI scans, the most common approach is for the patient to attend a further follow up clinic (n=13/25; 52.0%), although many sites will telephone the patient, either ad hoc (n=5/25; 20.0%) or through a formalised virtual clinic (n=5/25; 20.0%).

Strategies can vary between consultants in the same organisation, with free-text comments such as “... some phone patients with MRI results, most review in ED Clinic.”

Frustration with the challenges presented by this patient cohort was evident, with many free text comments provided, most relating to (lack of) access to complex imaging:

“A pathway was suggested for immediate MRI scanning, however Radiology were unable to provide this service.”

“Timing of MRI can vary. Sometimes on the same day as the ED review clinic (if slots are available). More typically, the scan occurs at around 2 - 5 days after the ED review clinic.”

A wish to resolve ownership of the pathway was also acknowledged by some:

“We used to follow up our ? scaphoid fractures with a CT at 10 days if still symptomatic. We now no longer have clinics hence the hand team follow them up.”

“Our pathway, although successful in terms of it's sensitivity, makes the 3 times weekly ED clinic essentially a 'atypical wrist pain' clinic. We are considering asking ortho to take on scaphoid fracture investigation for this reason.”

“All of our ?# scaphoids get managed in # clinic.”

Discussion

This survey confirms that this cohort of patients represents an ongoing challenge to the NHS with similar findings to the previous surveys²⁴⁻²⁶. Although the NICE guidance²⁸ suggested that clinicians should consider the use of MRI as a first line investigation, this is not being adopted, despite more recent economic evidence.¹³ Overwhelmingly the current strategy

continues to be risk averse, aimed at reducing the potential of a fracture being missed, even if this is not cost effective.^{13,28,30} Reviews of UK litigation related to wrist and scaphoid injuries are conflicting in their outcomes, with some suggesting it to be more likely to be due to poor clinical assessment⁷ but concluding that urgent MRI will limit the number of claims.^{8,9} Our results confirm that patients can wait for up to a month with multiple hospital visits before their discharge from acute care. A single site has reviewed the risk and decided to discharge after only a single X-ray series with aftercare advice. This has been locally audited, although there is no published research to corroborate the effectiveness of this.

The variation in practice identified a range of complex resource related issues both in terms of follow up capacity (ED and beyond) and limitations, or delays, in accessing cross-sectional imaging. Numerous imaging strategies are in use, even at an individual site level, with serial X-rays, MRI, CT and/or NM being used, with the preference being for MRI. This survey was directed at ED rather than imaging services, but the feedback from the respondents suggests that this relates to an MRI capacity gap, acknowledged as a risk for implementation by the guideline development committee.²⁸ A recent radiology-focussed survey²⁶ concluded there was no link between the numbers of MRI scanners and access for imaging, but did identify ongoing capacity issues within the modality. Funding and equipment costs have been identified by others as key reasons why NICE guidance is not implemented in practice.^{31,32}

CT has been suggested as an alternative imaging strategy with easier 24/7 access.³⁰ Newer low dose CBCT scans may offer a medium-term solution as this technology is adopted into practice. Although CBCT utility is yet to be demonstrated in an NHS setting early outcomes from international studies are promising, for the identification of scaphoid fractures and other injuries to the radiocarpal region.^{19,24}

The local decisions to move the ongoing care of patients with a suspected, but not proven, scaphoid fracture out of the ED and into the other hospital services is likely multifactorial, linked to finance and ED capacity. A virtual clinic approach is being adopted by many sites, reducing the need for physical follow up, particularly for informing patients of imaging results. Whether this is a formally documented episode of care (with related income for the activity) or a more informal strategy to mitigate patient attendance and staff time, is unknown.

Limitations

The survey suffered a relatively low response rate and therefore the results cannot be generalizable but does enable confirmation of the variation in practice.

Conclusion

This survey highlights the ongoing challenge of a resource intensive pathway for the management of suspected scaphoid fractures. Despite the publication of national guidance UK EDs are utilising a variety of imaging and follow-up strategies to minimise the potential of a missed fracture. The panacea remains a streamlined approach with early discharge and a safety net for those who remain symptomatic, although reliance on cross-sectional imaging investigations means this may be still a way off.

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