‘Clinical scaphoid fracture’: is it time to abolish this phrase?

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ABSTRACT

INTRODUCTION Most patients with post-traumatic painful wrists and negative radiographs are treated as having a clinical scaphoid fracture. Such cases are usually followed up with repeat radiographs. If the radiographs are inconclusive further imaging is done. However, this traditional approach results in the vast majority of patients being unnecessarily immobilised for an unspecified period, leading to loss of productivity and income to the patient and the community. A number of studies have highlighted the use of early CT or MRI scans to identify these fractures. The aim of this study was to evaluate our current practice in managing patients with suspected fractures of the scaphoid.

PATIENTS AND METHODS A retrospective audit was carried out. The period studied was from January to August 2008. Fifty consecutive patients who were investigated for occult fractures of the scaphoid were included.

RESULTS 92% of the patients studied had a repeat radiograph in the fracture clinic. 84% of the patients had their wrists immobilised in a cast while awaiting further imaging. Only 6% had confirmed fracture of the scaphoid; all of these healed uneventfully. 76% of patients with negative scans had their wrists immobilised for an average period of 30.63 days.

CONCLUSIONS It is time we rethink this dogmatic approach to patients with clinical signs but negative radiographs. We recommend that patients with a painful wrist following an injury and negative radiographs should be referred early to an appropriate clinician and earlier recourse to advanced imaging should be advocated.

KEYWORDS

Occult – Scaphoid – Fracture

Accepted 14 December 2010

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The scaphoid bone is the most commonly fractured carpal bone, accounting for 51–90% of carpal fractures and 2–7% of all fractures.¹ Clinical examination and radiographs are known to be poor in diagnosing these fractures.² Consequently, patients with negative radiographs are treated as having a clinical scaphoid fracture on clinical grounds, with temporary cast immobilisation. At about two weeks a second set of radiographs is taken. If the radiographs are inconclusive then further imaging is performed. However, this management strategy results in many patients being unnecessarily immobilised for an unspecified period of time until a diagnosis is made.

A number of studies have highlighted the use of early CT or MRI scans to identify these fractures,^{2–5} thereby avoiding unnecessary immobilisation and also the loss of productivity and income to the patient and the community.

Patients and Methods

We conducted a retrospective audit to evaluate our current practice in managing patients with suspected fractures of the scaphoid. The study period was from January to August 2008.

A list of patients who had either a bone scan, CT scan or MRI of the wrist was obtained from the radiology department. From this list, all those patients referred from the fracture clinic were identified and their records were reviewed. Those patients who had one of these investigations to rule out occult fractures of the scaphoid were included in the study. All these patients were initially seen in the accident and emergency department and then referred to the fracture clinic 10–14 days later for further assessment of a traumatic painful wrist. 50 such patients were referred for second line imaging to rule out fracture of the scaphoid in the study period. The data were then collated from their case notes.

Figure 1 Second line imaging

Figure 2 Diagnosis

Results

There were 14 males and 56 females in the study. The average age of the patient was 37.02 years. 92% of patients had a follow-up radiograph in the fracture clinic.

84% of the patients had their wrists immobilised in a cast while waiting for investigation to confirm the diagnosis. The average time taken for second line imaging to confirm the diagnosis was 15.4 days. Bone scan (52%) was the preferred second line imaging followed by MRI (Fig 1). Only 6% of the patients in this audit were confirmed as having fracture of the scaphoid. All of these fractures healed uneventfully (Fig 2). 19% of the patients had other injuries, fracture distal radius being the most common. 76% of patients with negative scans had their wrists immobilised for an average of 30.63 days (± 6.9). Four of the patients had persistent symptoms and were later treated successfully for de Quervain's tenosynovitis.

Discussion

Diagnosing occult fractures of the scaphoid has been a bane to the treating physician for many decades. The fear of litigation for missing or mistreating this injury has led to many of these patients with painful wrists being over-treated. Therefore, any patient with a fall on his or her outstretched hand, in the presence of tenderness in the anatomical snuffbox and absence of radiological features of scaphoid fractures, is diagnosed as having a clinical scaphoid fracture, ie treated in a cast and reviewed in the fracture clinics with a repeat x-ray of the wrist in 10–14 days. Parvizi *et al* showed that a combination of three clinical tests had a specificity of 74% within the first 24 hours.⁶ Clinical diagnosis of scaphoid fractures is therefore unreliable and four of five patients will not have a fracture.⁵

Fractures of the scaphoid are not visible in about 16% of cases on initial radiographs.⁷ Untreated, proven fractures of the scaphoid can lead to non-union, a vascular necrosis and advanced arthritis. It is for this reason that a number of these patients are over-treated to avoid under-treating a few.⁸ As a result, three of every four patients will undergo needless immobilisation,⁵ resulting in a significant cost to the individual and the community.²

Patients are routinely given a follow-up radiograph 10–14 days later. A survey published in 2009 showed that 94% of clinicians still performed a second set of radiographs after 2 weeks.⁹ This is based on the notion that decalcification around the fracture site would render the fracture visible on follow-up radiographs.¹⁰ A number of studies have proven the futility of such practice.^{1,4,11–15} 'We have surely superseded the old fashioned "philosophy" of an X-ray out of plaster at 10 days.' This was stated in an editorial in 1991¹⁴ and yet, despite advances in imaging techniques, this still seems to be standard practice.

The best second line of investigation in equivocal cases has been debated for many years. Radionuclide scans, CT scans and MRI have all have been proposed. Bone scans have a higher sensitivity than radiographs and hence a number of patients may be over-treated.^{5,15} Secondly, although it does allow for direct visualisation of the abnormal area, it may not be specific for a fracture or soft tissue injury. MRI has a better predictive value and is cost-effective.^{5,15,16}

Our audit has once again highlighted that a considerable number of patients are immobilised unnecessarily for a substantial duration while awaiting diagnosis. Although it is a retrospective study, the results are consistent with most studies in the literature.^{5,11,14} Only 6% of our patients had fractures of the scaphoid and 19% had other carpal fractures. Almost a quarter (24%) of our patients had a positive

result and required immobilisation for treatment and 76% of Opations with negative scans were immobilised for an average of 30 days. This is not only at a considerable cost to the community but it also has financial implications for the healthcare provider.

Most of the current practice is still based on the ideas proposed by Todd in 1921,¹⁴ namely on the belief that an untreated fracture of the scaphoid can lead to non-union or avascular necrosis. This may be true in proven cases of scaphoid fractures but the natural history of occult fractures is not clear. Sjölin advocated against immobilising patients with such injuries¹⁷ and immobilisation in a sling with an early review by an experienced surgeon can minimise the number of patients requiring immobilisation.¹⁸ However, in our series, a number of patients had other injuries (Fig 2). An initial period of immobilisation might therefore be helpful. Although we agree with Tai *et al*¹⁹ that these fractures should be recognised and treated as a different entity, further research is required to decide whether these injuries can be safely treated without immobilisation. Until then the emphasis should be on symptomatic treatment of these injuries and early referral to the appropriate clinicians to establish the diagnosis.

Despite a large number of scientific papers highlighting this fact, this injury continues to be managed in the same traditional manner. The authors feel it is time we base our approach on the current available evidence. Lack of guidelines/protocols within the institutions^{9,20} could be another reason for this continuing trend. A recent study concluded that implementation of a clinical practice guideline resulted in early diagnosis and reduced unnecessary immobilisation.²¹ Although MRI has been proven to be the preferred modality of imaging in such cases, the authors do appreciate that clinicians in accident and emergency departments or fracture clinics may not have direct access to MRI scans in many NHS hospitals. Nevertheless, we believe an early diagnosis will not only be beneficial to the patient but will also be cost-effective for the healthcare provider.

Conclusions

It is time we rethink this dogmatic approach to patients presenting with painful wrists following an injury, who have clinical signs but negative radiological evidence.¹⁷ A large number of patients still undergo needless immobilisation, leading to unnecessary follow-up appointments. We recommend that patients with a painful wrist following an injury and negative radiographs should be referred early to an appropriate clinician and earlier recourse to MRI is advocated to confirm the diagnosis. Repeat radiographs have no role in such cases. Most of these patients can be safely treated with a temporary splint until a diagnosis is made.

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