The Hand Patient: Fracture of the scaphoid

Prof Ulrich Mennen
MBChB, FRCS(Glasg), FRCS(Edin), FCS(SA)Orth. MMed(Orth), MD(Ort) Pret
Head: Department of Hand-and Microsurgery, MEDUNSA

Dear Colleague,

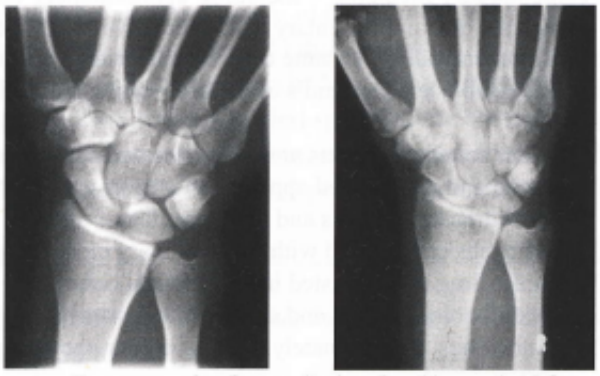
Re: Your patient with pain in his right wrist after a fall on the outstretched hand

Thank you for your referral of Mr. AMN a 23-year-old right dominant professional soccer player who fell on his out-stretched hand two days ago during a match. He did not think much about the injury initially, but he gets worried because the pain persists. This is most annoying since all movements of daily activities are painful. He also notices that there is some swelling on the radial side of his right wrist. He does not suffer any other injuries.

On **examination** it is clear that Mr. M has injured his right wrist. There is a swelling on the radial side especially in the region of the snuffbox. The snuffbox is completely obliterated by the swelling. Pressure in this area is most sensitive. Examining the rest of the wrist does not produce the same kind of pain. The neurovascular examination of the hand is normal.

The **special investigation** included the following x-ray views: A posterio-anterior view of both wrists on one film in radial deviation and one in ulnar deviation, an oblique view of both wrists as well as a lateral view of both wrists. The x-ray views confirm soft tissue swelling and a thin hairline crack fracture of the waist of the scaphoid. The ulnar and radial deviated views confirm that this is a stable fracture without any displacement. The distance between the scaphoid and lunate is the same as on the left-hand side. No other abnormalities are seen. The **diagnosis** is therefore an undisplaced, stable fracture of the waist of the right scaphoid, without scapho-lunate disassociation i.e. ligament injury.

The **management** is conservative since the fracture is stable and undisplaced i.e. the articular cartilage is still intact. The treatment is a below elbow, well fitted, snug circular cast with the thumb in abduction and the wrist in 30 degrees of dorsiflexion. The cast should be replaced after a week since the reduction of the swelling will result in a loose cast. The second cast should stay on for six weeks. At this stage a macro x-ray view of the scaphoid should be taken to determine the status of healing. If the healing process is satisfactory a further six weeks in a plaster cast should be sufficient for complete union. However should there be signs of delayed union one should strongly consider doing an open internal fixation with bone grafting. The internal fixation should take the form of a screw rather than Kirschner wires. The screw will allow stable fixation. Six weeks of plaster postoperative should be sufficient to allow for soft tissue healing. After the initial six weeks in plaster, a removable wrist splint is worn during the day for an additional six weeks.



A macro-X ray example of an undisplaced stable scaphoid fracture which has healed with 7 weeks of a below elbow plaster-of-paris cast immobilization. (Fig. 1 and 2). All unstable i.e. displaced scaphoid fractures should be surgically stabilized with a compression screw.

DISCUSSION

Much confusion exists as to the type of splinting that should be used for scaphoid fractures. It has been shown that a well fitted tight circular POP with the thumb included in abduction and the wrist in 30 degrees of dorsiflexion is adequate for undisplaced scaphoid fractures. It is recommended that any unstable scaphoid fracture i.e. *any* amount of displacement seen on radial or ulnar deviated x-ray view should be operated on. Anatomical reduction and internal fixation with one of the compression screws available is the method at choice. The postoperative immobilization should not be longer than six to twelve weeks at the most. The reason for this is that long-term immobilization causes osteopenia which is a further contributing factor for delayed union.

In general the following approach should be used for the *management of wrist injuries*: An initial standard plain x-ray view of both wrists should be taken. If no fracture is seen the wrist should be immobilized for three weeks in a plaster cast as described above. After the three weeks a follow-up x-ray view should be taken of the wrist. If no fracture is seen a diagnosis in retrospect may be made of a wrist sprain. Since the wrist has already been splinted for three weeks the treatment given thus far was sufficient for the soft tissue to heal.

Should a fracture however been seen at three weeks the radial and ulnar deviated stress x-ray views should be taken to confirm stability. If the fracture is stable the immobilization should be continued for six weeks and a control x-ray taken. If the fracture shows delayed union an internal fixation with bone grafting should be contemplated. However if the fracture shows healing a further period of six weeks should be adequate for the healing.

Should there be a fracture visible on the initial x-rays which is unstable an open reduction and internal fixation is indicated. If bone loss is present such as compression, comminution or a cyst, bone grafting in indicated initially. A post-op six-week splint is sufficient to allow soft tissue healing. This is followed by a removable wrist splint for an additional six weeks.

It is strongly recommended that all unstable fractures be internally fixed since these are intra-articular fractures. An untreated unstable scaphoid fracture causes biomechanical mal-alignment, which on average will produce articular osteo-arthritis of the wrist within nine to ten years.