

## Scaphoid Fracture

The scaphoid is a very important small bone in the wrist (carpus). It is the most commonly fractured carpal bone because it has a very important functional role in the wrist which causes it to transmit large forces, especially when the wrist is forced into an extreme position while carrying a load, for example in a fall on the outstretched hand. It is particularly an injury of young active people, often during sport.

Diagnosis of scaphoid fracture should be suspected when there is pain and tenderness, especially in the hollow between the base of the thumb and the wrist ("anatomical snuff box"). However the diagnosis can only be confirmed or excluded by x-ray, which is essential in such an event.

Reassurance on the basis of examination alone is inadequate. Even after x-ray, it may be wise to treat the wrist as though there has been a fracture then repeat the x-ray (or use a scan), since it is possible that a hairline fracture of the scaphoid will not show on the first x-ray.

Conventional treatment of a confirmed scaphoid fracture is immobilization in plaster or a close-fitting splint for 8 weeks. The exact position of the fracture may affect the outcome, but in general it can be expected that 90% of scaphoid fractures will heal if treated in this way. This is a much lower rate of fracture healing than one would expect with fractures in general, and is because the scaphoid is particularly vulnerable for three reasons; it is largely covered with cartilage and has limited ligament attachments through which blood supply can enter the bone; blood supply may be cut off by the fracture from one end of the bone; and mechanical forces within the wrist may tend to displace the two halves of the broken bone even while it is held in plaster.

An alternative form of treatment is immediate fixation of the fracture with a buried screw. In an appropriate injury (undisplaced fracture of the middle or proximal end of the bone) it may be felt appropriate to carry out the screw fixation through a very small incision using x-ray control. The potential benefit is a shorter period of splintage (maybe only 3 weeks in a favourable fracture), and greater certainty of bone healing provided the screw is inserted appropriately. However, it is not technically easy, and if the screw is incorrectly inserted or fails to gain proper control of the two halves of the bone, the situation could be made worse than the outcome of simple plaster immobilization.

Nevertheless, this form of fixation appeals to sportsmen and women because it promises earlier return to full activity.

If a scaphoid fracture fails to heal after plaster immobilization or screw fixation, a further attempt to secure healing may be offered in the form of a bone graft, usually but not inevitably with screw fixation. The small bone graft can be taken from the forearm (radius bone) close to the wrist, or from the hip (the sharp bone prominence that the trouser belt rests on). There is a fairly recently described operation in which the blood supply to the bone graft is preserved as it is moved into the scaphoid (vascularized bone graft), and this has great theoretical appeal but it hasn't yet been possible to prove conclusively that it improves the outcome.

In a favourable scaphoid non-union (not too old a fracture, not a major traumatic disruption of the scaphoid) there is still a reasonable chance of success with bone grafting. Unfortunately however there is a fair likelihood of later arthritis following any scaphoid fracture, particularly when there has been difficulty in securing healing.

If the fracture doesn't heal following all efforts, late arthritis is inevitable. Persistent symptoms with non-union may be helped by a variety of operations designed to limit symptoms, but these have considerable disadvantages in terms of range of movement.