Wrist fractures are common. Some are complicated, such as highly comminuted distal radial fractures or trans-scaphoid peri-lunate dislocations. However, even straightforward cases cause litigation claims, most of which appear avoidable.

The aim of this article is to identify the common pitfalls and how to avoid them.

Radiographs

It is the responsibility of the requesting clinician to ensure adequate radiographic views. Remember to check for carpal injuries, including scapho-lunate dissociation on the postero-anterior (PA) radiograph and check distal radio-ulnar joint (DRUJ) alignment on the lateral radiograph, not merely focus on alignment.

Decision to Operate

Well established parameters guide decision-making, particularly for extra-articular fractures (Table 1). Well beyond these parameters the decision making is usually easy. However, treatment may be recommended below these parameters for patients with high functional demands. Decision making is difficult at or around these parameters or if there are concerns regarding co-morbidities or compliance. It is important to hold a detailed, informed, consent process with the patient; ultimately it is their decision. This must be recorded clearly in the notes. In doubt, take the opinion of more than one clinician and again record in the notes.

Table 1 - Acceptable parameters for distal radius fractures

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<thead>
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<th>Parameter</th>
<th>Criteria</th>
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<td><strong>Mainly seen on the PA radiograph:</strong></td>
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<td>Shortening of &lt;2mm, loss of ≤10° of radial inclination intra-articular step of ≤2mm</td>
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<tr>
<td><strong>Mainly seen on the lateral radiograph:</strong></td>
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<tr>
<td>≤10° dorsal tilt (i.e. dorsal tilt of ≤21° from the normal volar tilt of 11°)</td>
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Re-manipulation

Re-manipulation does not improve outcome. If a fracture displaces following a satisfactory manipulation in the Emergency department, re-manipulation is very unlikely to help. When a patient is reluctant to have open surgery remanipulation can be of value. The patient needs to be counselled carefully. As always, the key is the consultation with the patient, which should not be rushed, and maintain detailed records.

Follow up in the Fracture Clinic

It is well recognised that distal radial fractures may displace for “up to 2 weeks” following the injury. If a fracture has not displaced significantly either from the original radiographs or from the original post-manipulation radiographs, then at two weeks from injury it is very unlikely to displace further and it is reasonable to continue to immobilise in plaster. “Two weeks” means at least 12 days. Ten and even 11 days are not enough. It is easy to bring the patient back the following week for another radiograph. This is simple, relatively low cost to the patient and NHS, and avoids litigation.

There is a mistaken belief that beyond two weeks there will “never” be further displacement. If at two weeks the fracture has displaced in the preceding week it must be assumed to be mobile unless proven otherwise, by repeating the radiographs in another week. The most important lesson of this article is that if a fracture is displacing, i.e. the position is worse than a week before, then just because a patient has reached the two week mark, it does not mean that the fracture will not continue to displace. They should continue to be reviewed, unless surgery is indicated. Some patients may need review up to four weeks.

Choice of Operation

There is a recent trend towards the use of volar locking plates. Recent research, particularly the provisional findings from the DRAFFT trial suggests that K-wiring of fractures gives equivalent outcome to volar plating, providing there is an adequate position on closed manipulation. The choice is not critical. Both options appear acceptable.

Performance of K-wiring

Biomechanically a better reduction is more stable. Dorsal comminution adversely affects stability. Typically 3–4 1.6mm K-wires should be used with more wires in less stable reductions. The optimal configuration is unproven; most combinations, including intra-focal wiring, appear reasonable.

Performance of Volar Locking Plating

This is technically a difficult operation. Many complications have
been described1,2. The key steps include:
- Ensuring the distal row of screws is reasonably parallel with the articular surface of the distal radius so that as the plate is applied proximally, there is correct alignment.
- It is easy with locking plates for the plate to sit off the bone. Using a non-locking screw as the first screw in the distal plate pulls the plate onto the bone; subsequent screws/pegs can be locking;
- The distal screws/pegs should not be too long. On the lateral radiograph the screws or pegs should end around 3-6 mm short of the dorsal cortex. Not least as the base of the 3rd dorsal compartment is usually up to 3mm volar to the radiographic shadow of the dorsal cortex. Rarely should a distal screw/peg be >22mm long.
- It is easy to place the tip of the screws in the radial carpal joint or the DRUJ. That is not a breach of duty of care, but leaving the screws misplaced is.
- Take and scrutinise perioperative radiographs carefully.

Follow Up Care

Soft Tissue: Too often the focus is on the radiographs. Soft tissue problems such as carpal tunnel syndrome, EPL rupture or complex regional pain syndrome (CRPS) are overlooked. Patients should achieve virtually full finger and thumb movement within 10-14 days of injury or surgery. If not, initiate investigation and appropriate treatment.

Bone Alignment: In non-operative treatment, bone alignment should be checked as above.

Repeat radiographs: While it is tempting to accept peri-operative radiographs, a post-operative radiograph is recommended at the first clinic visit. Many times an abnormality is shown on post-operative radiographs, which was not clear before. In particular, take specific radiographs demonstrating screw placement. There is rarely a good reason for leaving a screw in the radio-carpal joint or DRUJ.

Failed K-wiring of distal radial fractures: The management of an unacceptable distal radial fracture position one week after K-wiring is complex. It is difficult to know whether to re-operate; there needs to be a discussion with the patient and probably a documented discussion with colleagues to decide how best to address this problem. If there is marked re-displacement repeat K-wiring may be appropriate. Volar plating is probably preferable. Because of concerns over infection following K-wiring many surgeons recommend removing the K-wires and waiting 3-5 days before ORIF.

Overlooked scapho-lunate instability: Scapho-lunate instability may present which was not evident initially. This may represent a progression of the instability or a settling out of the bones once the fracture position has been corrected. It is easy to overlook the scapho-lunate gap; it is essential to review the entire radiograph, not just the obvious fracture. Management decisions are complex3. At present there is insufficient evidence that one means of treatment is superior to another. Delay in treatment of up to three months probably makes little difference, although ideally repair should be earlier if considered appropriate. Discussion with a hand or wrist surgeon is essential.

Late DRUJ instability: Late DRUJ instability can occur4. Typically the ulna subluxes dorsally (technically the radius goes volar with the ulna a fixed structure) and is easy to overlook radiologically (Figure 1). Blocked supination should alert the clinician to this possibility on clinical evaluation. Supination is the most important movement to restore early around the wrist. Wrist flexion and extension may return late, even beyond a year, and are less important functionally, but forearm rotation needs to be re-established quickly, preferably within six weeks. Patients should achieve 20-30° of supination and pronation within two weeks. A block in one direction indicates a DRUJ problem. In a busy clinic all of these points are easily overlooked. Attention to detail is critical: it takes much less time than responding to complaints or litigation.

Dinnerfork deformity seen in Colles’ fracture

Grey Giddins is an Orthopaedic and Hand surgeon in Bath. He has an interest in wrist injuries and in medical error. He has published a number of articles on both topics. He is also the Editor-in-Chief of the Journal of Hand Surgery (European).

Miss Ilana Langdon trained in trauma and orthopaedics in Bristol and with an interface hand fellowship in Manchester, followed by a AO trauma fellowship in Harborview Hospital, Seattle. She has been a consultant hand and T&O consultant in Bath since 2002. Her other interest is medical education, and is Training Programme Director for Core Surgical Training in T&O for Severn Deanery, and Associate Director of Medical Education for the Royal United Hospital, Bath.

Correspondence:
Email: greygiddins@thehandclinic.co.uk
Email: ilana.langdon@nhs.net

References can be found online at www.boa.ac.uk/publications/JTO or by scanning the QR Code.
References


