



Figure 9-10. Colles' fracture.

(Cannon, 2003). If the fracture is unstable, fixation may be necessary for the best outcome. Numerous techniques can be used by the surgeon including percutaneous pin fixation, external fixation, and **open reduction with internal fixation (ORIF)**. With ORIF, a plate and screws are utilized by the surgeon to stabilize the radius after fracture. The technique used is contingent upon numerous variables, which may include: the surgeon's preference and expertise, the client's age and medical condition, and the type of fracture displacement (Burke, Higgins, McClinton, Saunders, & Valdata, 2006). There is a recent trend to perform ORIF more often when appropriate after a Colles' fracture so as to begin gentle, controlled ROM earlier and avoid limiting conditions such as "fracture disease." Gold Box 9-1 provides a definition of fracture disease.

Occupational therapy treatment techniques will vary according to the fixation techniques used by the physician. Occupational therapy treatment goals for any distal radius fracture should be maximum pain-free forearm and wrist ROM and full ROM of the fingers, thumb, elbow, and shoulder with a return of upper extremity function (Hunter et al., 2002). It is beneficial to initiate occupational therapy while the wrist is still immobilized. The therapist can regain and maintain full shoulder, elbow, finger, and thumb ROM by the time the wrist is ready to be mobilized with early intervention. According to Hurou (1997), occupational therapy intervention assisted clients with distal radius fractures to resume functional activities by significantly increasing wrist and forearm AROM and grip and pinch strength. There is often edema in the thumb and fingers that is more difficult to resolve as it becomes chronic. Edema decreases mobility, reduces circulation, and leads to fibrosis if not resolved early (Hunter et al., 2002). Unfortunately, many clients are not instructed



Figure 9-11. Moderate edema in the left hand.

in edema control techniques immediately after casting or surgery. Clients should be individually instructed and provided handouts during occupational therapy. Figure 9-11 illustrates moderate edema in the left hand.

The best way to control edema is through the use of elevation. For elevation to be effective, the elbow should be positioned above the heart and the hand positioned above the elbow. Other edema control techniques include: finger range-of-motion (ROM) exercises, distal to proximal retrograde massage, lymphatic massage, compression garments such as gloves, and cardiovascular exercise. This is not an all-encompassing list as there are many other approaches used to control edema. Gold Box 9-2 identifies an edema control technique handout used in an occupational therapy facility.

A client will be referred to occupational therapy after a Colles' fracture has healed and the doctor feels the client can begin treatment. The cast may be removed if surgery was not required, which usually occurs approximately 6 weeks post injury. If an ORIF was required for proper alignment, the client may be referred to occupational therapy from 2 to 6 weeks after surgery depending on the referring physician.

Complications can occur after a distal radius fracture. The most common complications are carpal tunnel syndrome (CTS), malunion, complex regional pain syndrome (CRPS), and **tendon rupture**.

In CTS, the median nerve, which supplies sensation to the thumb, index, and middle fingers, becomes com-

Gold Box 9-1

Fracture Disease

A collection of symptoms caused by prolonged immobilization in a cast. It can lead to unresolved edema, pain, and stiffness even in the unaffected joints of the upper extremity. Muscle atrophy and osteoporosis can occur. Fracture disease can be avoided with early intervention of edema management and active range of motion of the fingers, elbow, and shoulder while the client is casted.