Editorial

Differentiated treatment of Colles' fracture

Thousands of articles published after Abraham Colles described "a very common fracture of the distal radius" in 1814 have not yet created a consensus on a treatment program. Most cases of Colles' fracture are still treated with closed reduction and plaster-cast immobilization in spite of a growing concern with poor results in many cases (Solgaard 1986).

An analysis of results and complications after distal radial fractures must consider the fracture type. First, it is necessary to separate fractures in younger patients from fractures in the osteoporotic patient. High-energy fractures represent a totally different treatment problem and should not be included in a treatment program for Colles' fracture (Knirk and Jupiter 1986). Secondly, the fracture pattern must be classified. Various systems for classifying radial fractures based on the amount of comminution of the fracture, the involvement of adjacent joints, and the degree of shortening of the radius have been presented: viz., by Lidström (1959), Older and Cassebaum (1965), Frykman (1967), and Sarmiento et al. (1975). Others have emphasized the involvement of the ligamentous structures of the distal radioulnar joint as being a poor prognostic factor (af Ekenstam et al. 1985), but repair of the triangular complex does not seem to improve the fracture stability (af Ekenstam et al. 1989). Radial shortening is probably the most significant displacement for the radiographic and clinical outcome of the fracture (Villar et al. 1987). Older's (1965) classification is mainly based on this factor, and has consequently proved to be the most reliable one in a comparative study (Solgaard 1985).

Minimally displaced Colles' fractures are often overtreated today. Some of the poor results in Lidström's (1959), Frykman's (1967), and Cooney's et al. (1980) series were due to treatment complications. In the finger-hand-shoulder syndrome, stiffness and pain account for poor hand function. One etiologic factor abetting the development of this complication is poorly fitted plaster casts, with immobilization of the fingers preventing the pumping mechanism of the clenched fist. Various frequencies of nerve injuries, particularly those affecting the median nerve, have been reported. Kongsholm and Olerud (1986) emphasized the role of the injection of the local anesthetic into the fracture hematoma as an etiologic factor. Immobilization of the wrist joint in volar flexion is another factor effecting nerve damage. Minimizing plaster-cast treatment of stable fractures might reduce the incidence of these complications. Many attempts have also been made at a more functional approach to treatment, with a minimum of immobilization using various types of external braces that permit movement of the wrist joint (Sarmiento et al. 1975, de Bruijn 1987, Abbaszadegan 1989, Ferris 1989). Complications seem to be less common and the functional end result improved by these methods in certain types of fractures (de Bruijn 1987).

Just as detrimental as is the overtreatment of a stable Colles' fracture so is the undertreatment of the more displaced fracture. Immobilization in a plaster cast is, by definition, an inferior method to preserve radial length, and many reports have shown a very significant recurrence of radial shortening with this method (Solgaard 1986, Abbaszadegan et al. 1989a, Solgaard 1989). Because radial shortening is the most important displacement in Colles' fracture, many poor results might have been prevented with a more effective method of stabilizing the fracture. Treatment with pins and a plaster cast (Green 1975), methyl methacrylate stabilization, and various types of internal fixation have been tried (Kofoed 1983, Schmalholz 1988). Probably the most effective and simplest treatment that prevents radial shortening, however, is the external fixator, which has been used in both comminuted intraarticular and displaced extraarticular fractures (Cooney 1983, Kongsholm and Olerud 1986, Jenkins et al. 1987, Kaukonen et al. 1989). Because the tendency of a Colles' fracture to redislocate can be predicted (Abbaszadegan et al. 1989b) and because closed re-reduction of a redisplaced fracture is hardly worthwhile (Schmalholz 1989), external fixation, then, should be performed as the initial, primary treatment in fractures with notable shortening.

However, external fixation may be impractical in severe osteoporosis, notably in the very old. Bone cement has been shown to provide an efficient spacer in maintenance of radial length with rapid recovery of hand function (Schmalholz 1988, 1990).

Based on this discussion a differentiated treatment program of Colles' fractures in the elderly is proposed:

1. Fractures with no or minimal displacement (Older's Types 1 and 2 with radial shortening less than 2 mm) should be treated without plaster-cast immobilization (Abbaszadegan et al. 1989a). This type of fracture represents more than half of all Colles' fractures (Solgaard 1986).
2. Fractures with moderate displacement (Older's Type 3 with radial shortening less than 5 mm) should be treated conventionally with closed reduction and immobilization in a plaster cast.
3. Fractures with severe displacement (Older's Type 3 with radial shortening exceeding 5 mm and Older's Type 4) should be treated with external fixation. This fracture type could represent about 10 percent of all Colles' fractures (Solgaard 1986).
4. Displaced fractures in elderly osteoporotic patients may be treated with a methyl-methacrylate plug inserted dorsally to maintain radial length and supplemented with a light dorsal brace or plaster cast.

This treatment program has the potential of minimizing complications from unnecessary plaster-cast immobilization and of preventing serious radial shortening as a main factor for poor results. Indeed, the economic and medical advantages of improved treatment are also evident, for the incidence of Colles' fracture has doubled in the last 25 years (Begnér and Johnell 1985).

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