EDITORIAL

Surgical or Conservative Treatment in Fracture of the Distal Radius?

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Editorial to accompany the article: „The treatment of displaced intra-articular distal radius fractures in elderly patients—a randomized multi-center study (ORCHID) of open reduction and volar locking plate fixation versus closed reduction and cast immobilization“ by Christoph Bartl, Dirk Stengel et al. in this issue of *Deutsches Ärzteblatt International*

Breaks of the distal radius at the typical site are the most commonly occurring fracture in humans (1). For many decades the predominant form of treatment was conservative immobilization in a plaster cast—preceded in some cases by closed reduction of the fracture. For unstable or intra-articular fractures requiring surgical management, the treatments of choice were Willenegger or Kapandji drill wire fixation or external fixation (1).

Valid scientific data

The management of distal radius fractures in Germany underwent a radical change with the introduction of volar locking plate fixation at around the beginning of this century. Good functional and radiological outcomes can now be achieved in a much shorter time with modern locking implants. On the other hand, open reduction with internal fixation involves far greater outlay in terms of personnel and materials. While cast treatment with or without K-wire fixation is usually an outpatient procedure costing just a few euros, treatment of a fractured radius by means of a locking plate system is mostly performed on an inpatient basis and incurs average costs of up to € 1000 (1).

To date there are no valid scientific data confirming the superiority of this method over other established procedures with regard to treatment outcome. Nevertheless, volar plate fixation is now widely propagated as the gold standard for treatment of distal fractures of the radius. The randomized study by Bartl et al. in the latest issue of *Deutsches Ärzteblatt* is thus very timely, as the once innovative surgical management of distal radius fractures via the volar route has been universally adopted solely on grounds of the positive clinical experience and is thus currently in stage 4 of the life cycle of medical innovations as described by John McKinlay in 1981 (3):

In stage 1, promising and enthusiastic early reports tempt clinicians to use the method. Stage 2 sees further positive case reports and case series; the method is used more widely, especially by innovative physicians. In Stage 3 the innovation is the talk of the town and is described as an accepted and tested technique, while in stage 4 it is hailed as the new standard and used everywhere—despite the first critical voices. At this point it has not been demonstrated whether the new method is merely an innovation or whether it brings quantifiable medical progress. Only

in stage 5 do randomized studies compare the results of the new standard to those of established procedures. There then follows stage 6, the defense stage, in which the study results are often disputed or the study designs criticized. In the extreme case, stage 7 sees the technique demonized or condemned as completely useless (3).

Will volar locking plate fixation follow this path? The first randomized trial comparing volar locking plate fixation with cast treatment showed a moderate advantage of surgical treatment only in the early phase (3 months) (4).

Difficulties in recruitment

The ORCHID study, a randomized multi-center trial of open reduction and volar locking plate fixation versus closed reduction and cast immobilization in elderly patients with displaced intra-articular fractures of the distal radius, was designed with the ambitious aim of providing valid data on this topic (2). The trial had to be discontinued, however, owing to sluggish recruitment. From a total of 3151 patients screened for the study protocol, only 185 of the 737 who were potentially suitable could be randomized. As many as 247 patients refused to participate in the trial or expressed a treatment preference. Furthermore, the conservative treatment group was characterized by a high conversion rate of 41%. These figures illustrate a perpetual dilemma of randomized clinical trials in trauma surgery and indeed in surgery as a whole: both the patients and their physicians hesitate to leave it to chance to decide whether they relinquish the old, yet long-established and proven method in favor of a new, allegedly innovative technique.

The members of the ORCHID study group are to be congratulated for taking on this challenge. The question of whether or not an innovation yields a quantifiable medical advantage can only be answered if we make the effort to design study protocols that will reveal to what extent our patients benefit from the new technique. In the ORCHID study surgical treatment, despite marginally quantifiable advantages—in terms of hand mobility after 12 months—did not lead to a significantly better outcome. The conclusion is that even in the era of volar plate fixation, primary nonsurgical management represents an effective option for treatment of distal radius fractures in suitable patients. The authors deserve credit for carrying out a study that has yielded scientifically valid data to back this up in elderly patients.

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Is locking plate fixation of distal radius fractures via the volar approach merely the latest innovation, or does it represent a genuine step forward? Studies such as ORCHID and critical discussion of their findings yield answers. The fact of an overwhelming majority of positive results in clinical practice speaks clearly in favor of the procedure. You can determine which stage of the life cycle of medical innovations this method is currently traversing.

Conflict of interest statement

The author declares that no conflict of interest exists.

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