Long-Term Outcomes After Distal Scaphoid Fractures: A 10-Year Follow-Up

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Purpose The aim of this study was to evaluate the functional, clinical, and radiological outcome 10 years after distal scaphoid fractures.

Methods From a prospective epidemiological study on posttraumatic radial-sided wrist pain, we evaluated 41 cases of distal scaphoid fractures. All cases had been treated nonsurgically in a thumb spica cast. Patients were examined using radiographs, magnetic resonance imaging and computed tomography at the time of injury and with computed tomography after a median of 10 years (range, 8−11 years). Fractures were classified according to a modified Prosser classification system. The primary outcome was assessment of self-reported function using Disabilities of the Arm, Shoulder, and Hand (DASH) and Patient-Reported Wrist Evaluation (PRWE). Secondary outcomes were clinical status (range of motion and grip and pinch strength) and to evaluate fracture healing and arthritis in the scaphotrapezium-trapezoid (STT) joint.

Results Functional impairment and pain scores at follow-up were low: median DASH score 2, median PRWE 0, and median visual analog scale (VAS) pain score 0. We found no impairment in range of motion or strength. We found 26 type I fractures, 12 type IIA, 1 type IIC, and 2 type IV. There was 1 asymptomatic nonunion in a type I fracture. Computed tomography revealed arthritis in the STT joint in 7 out of 41 wrists, none of which caused clinical symptoms.

Conclusions From an 8- to 11-year perspective, patients with distal scaphoid fractures report normal self-assessed hand function as well as good wrist motion and strength. The risk for development of posttraumatic STT arthritis was low. *(J Hand Surg Am. 2017;42(11):927.e1-e7.*

Type of study/level of evidence Prognostic II.

Key words Arthritis, classification, CT, outcome, scaphoid fracture.

Online Exclusive

THE SCAPHOID IS THE MOST COMMONLY fractured carpal bone with an incidence of 12 to 43 fractures per 100 000 people per year.[1,2] Fractures in the middle third of the scaphoid account for most fractures (65%−66%) followed by that of the distal third (25%−28%).[3,4] Fractures in the distal third of the scaphoid occur more frequently in children and adolescents and constitute the most common fracture type in children younger than 13 years of age.[5−8]

Distal fractures are believed to heal uneventfully, which is mainly explained by the vascular distribution of the scaphoid.[3,5,7,9] However, fractures with an intra-articular component may develop cartilage degeneration and posttraumatic arthritis. The occurrence of nonunion of distal scaphoid fractures has also been reported.[10−12] Nonetheless, knowledge concerning long-term clinical and radiological outcomes remains limited.

The aim of this study was to evaluate functional, clinical, and radiological outcomes 10 years after distal scaphoid fractures.

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Received for publication October 8, 2016; accepted in revised form June 14, 2017.

The study was supported by grants from the Swedish Research Counsil (Medicine) and Funds from Region Skåne.

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0363-5023/17/4211-0014$36.00/0
http://dx.doi.org/10.1016/j.jhsa.2017.06.016

METHODS

Patients

Over a 4-year period, from 2004 to 2008, all patients who presented at our emergency department with posttraumatic radial-sided wrist pain were asked to participate in a prospective study on diagnosis, treatment, and outcome of patients with scaphoid fractures.

The inclusion criteria were tenderness on the radial side of the wrist, distal to the radiocarpal joint and proximal to the carpometacarpal joints, after a trauma. The physical examination included testing for tenderness in the anatomical snuffbox, at the scaphoid tubercle, and by axial loading of the thumb.

Radiographs were taken of the wrist and scaphoid in all patients. Regardless of the results from the radiographs, a magnetic resonance imaging (MRI) study was performed within 3 working days from inclusion. If the MRI revealed a fracture, a computed tomography (CT) scan was also carried out. In all, 526 patients were examined. Based on results from imaging, patients were allocated to different studies. Fifty-five consecutive patients with distal fractures were identified and were treated according to a study protocol with a thumb spica cast for 4 weeks. If clinical symptoms persisted, the immobilization period was prolonged for an additional 2 weeks. No fractures were treated surgically. In 2015, the 55 patients were considered for the present long-term follow-up study. Six were excluded from this follow-up: 1 had died, 2 had dementia, one lived abroad, 1 had scapholunate advanced collapse (SLAC) arthritis prior to the injury, 1 suffered from severe rheumatoid arthritis, and 1 had spastic paresis in the arm in question. Thus, 49 patients were invited for a clinical and radiological follow-up (Fig. 1).

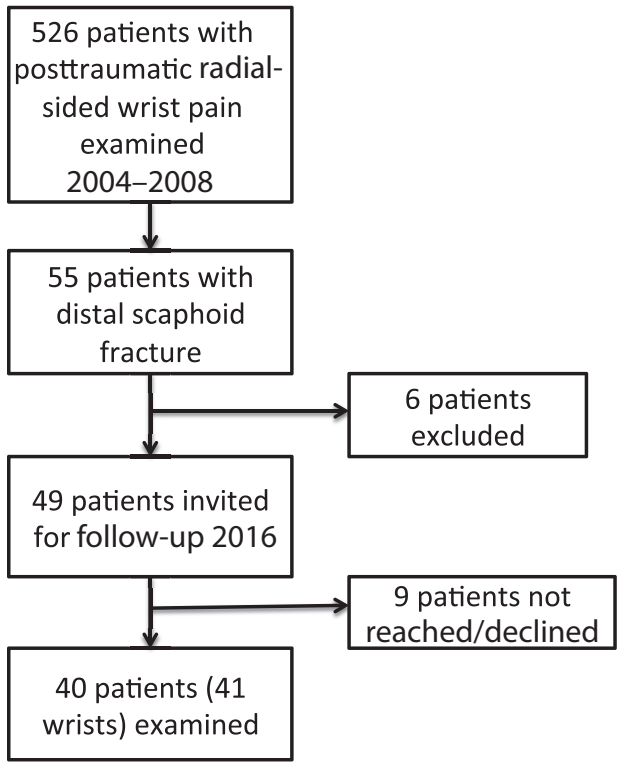

FIGURE 1: Patient flowchart.

Outcome measures

The primary outcome was assessment of self-reported function using Disabilities of the Arm, Shoulder, and Hand (DASH) and Patient-Reported Wrist Evaluation (PRWE). Secondary outcomes were clinical status (range of motion and grip and pinch strength) and to evaluate fracture healing and arthritis in the scaphotrapezium-trapezoid (STT) joint.

Patient-rated outcomes and clinical evaluation

At the long-term follow-up, patients completed the Swedish version of the DASH questionnaire[13] and PRWE form.[14] Pain at rest and during power grip was evaluated on a visual analog scale (VAS) scale ranging from 0 (no pain) to 10 (worst imaginable pain).

The patients were assessed for tenderness in the anatomical snuffbox, over the distal pole of the scaphoid, and following axial loading of the thumb. In comparison with the contralateral side, Watson shift test was considered positive if the maneuver gave rise to a marked sense of instability with pain on the dorsum of the wrist and not just where pressure is applied on the scaphoid tuberosity.[15] Wrist extension, flexion, and radial and ulnar deviation were measured using a goniometer. Grip strength was calculated as the mean of 3 measures using an Exacta Hydraulic Hand Dynamometer (North Coast Medical, Gilroy, CA). Lateral pinch strength was assessed in the same manner using a pinch gauge (B&L Engineering, Santa Ana, CA).

All measurements were carried out by 1 of the authors (M.C.) who had not been involved in the initial treatment of the patients but who was aware of which wrist was injured.

Imaging

At the time of injury: Initial radiographs (AXIOM Aristos FX; Siemens AG, Forchheim, Germany) included the wrist in posterior-anterior and lateral projections, and 4 additional views of the scaphoid (posteroanterior with ulnar deviation, with the central beam angled 10° caudally, 20° ulnarly, and 20° radially). A fracture was defined as a break in the bone continuity.

For the MRI of the wrist, a 0.23-Tesla low-field MRI unit was used (Proview; Marconi Medical Systems,