

Arpine Kocharyan  
Dr. med.

## **Long term results after conservative and surgical treatment of radial neck fractures in adults**

Fach/Einrichtung: Chirurgie Orthopädie  
Doktorvater: Prof. Dr. med. Paul Alfred Grützner

Radial neck fractures are rare in adults. There are few scientific publications available about this condition as far as the number of acknowledged classifications and treatment recommendations is restricted. The purpose of this study was to determine functional long-term outcomes after non-operative and operative treatment of radial neck fractures in adults.

To accomplish that goal a retrospective analysis of thirty-four (34) cases was performed. All selected patients with a mean age of  $46.5 \pm 13.6$  (range, from 18.0 to 63.0) years were diagnosed with fracture of the radial neck, treated and followed-up in the BG Unfallklinik in Ludwigshafen between 2000 and 2014. Twenty (20) patients were managed non-operatively. Nine (9) out of twenty (20) participants were diagnosed with radial neck fracture Mason type I, ten (10) participants suffered from Mason type II fracture, and the remaining one (1) patient had radial fracture Mason type III. Fourteen (14) patients underwent surgery. Nine (9) out of fourteen (14) patients had radial neck fracture Mason type II and five (5) suffered from Mason type III fracture. Ten (10) out of fourteen (14) patients in the operative group were treated by plate osteosynthesis and four (4) by crossed screw osteosynthesis, consequently. Ipsilateral radial head fractures Mason type I were diagnosed in seven (7) out of thirty-four (34) patients. Six (6) out of seven (7) patients with associated injuries underwent surgery and one (1) was managed conservatively. The radial head-shaft angle on the anterior-posterior view of the initial radiographs was significantly higher in the surgically treated patients group ( $26.3 \pm 21.5^\circ$  in the operative group vs.  $12.8 \pm 6.0^\circ$  in the conservative group,  $p=0.012$ ), while on the follow-up radiographs it did not differ significantly ( $p=0.054$ ).

After the mean follow-up of  $5.8 \pm 4.0$  (range, from 2.0 to 15.7) years clinical scores showed good results in both groups. The DASH Score was  $16.1 \pm 23.5$  points in the conservatively managed patients group and  $8.8 \pm 13.5$  points in the group of patients who underwent surgery. The MEPS was  $80.0 \pm 18.5$  points in the non-operative group and  $82.5 \pm 16.7$  points in the operative group, respectively. Five (5) out of twenty (20) conservatively managed patients and seven (7) out of fourteen (14) surgically treated patients developed complications. The most common complication in the conservative treatment group was pain syndrome (VAS > 5), while the surgically managed patients along with pain syndrome complained of more serious complications such as secondary dislocation and pseudoarthrosis. Revision rates were higher in the operative group (7 vs. 1). Six (6) out of seven (7) operatively managed patients who underwent revision surgeries were previously treated with plate osteosynthesis and only one (1) patient was initially managed with crossed screw osteosynthesis. Two (2) out of thirty-four (34) patients did not achieve working capacity. Both of them were treated conservatively. The average weekly time spent on sports decreased in both groups especially in the surgically managed patients (from 8 hours to 3 hours).

The study was limited due to its retrospective nature, the small sample size, individual basis of initial treatment decision, and difficulty of accurate measurement of the radial head-shaft angle because of poor quality of some images.

Measurement of the radial head-shaft angle and definition of the displacement grade should be used along with other classification systems for treatment decision.

Long time follow-up of uncomplicated, minimally displaced radial neck fractures after both conservative and surgical treatments showed good and excellent results in clinical scores.

The fracture angulation grade requiring surgical management should be distinguished by further studies.