Research Article

Outcomes After Hemiarthroplasty of the Elbow for the Management of Posttraumatic Arthritis: Minimum 2-Year Follow-up

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Procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000 and 2008. Informed consent for research purposes was obtained per institutional protocol.

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Abstract

Background: Hemiarthroplasty (HA) of the elbow represents an alternative to total elbow arthroplasty (TEA) without the associated activity restrictions. This study reviews our experience with distal humerus HA with minimum 2-year follow-up.

Methods: Between 2002 and 2012, 16 elbows underwent HA for posttraumatic arthritis of the elbow. Patients were followed for a minimum of 2 years or until revision surgery. Outcome measures included pre- and postoperative Mayo Elbow Performance Scores (MEPSs), complications, and revisions.

Results: Mean age at arthroplasty was 45 years, and follow-up averaged 51 months. All patients had previously undergone one or more surgical procedures at the elbow (average of 1.5 procedures). At follow-up, five had undergone additional surgery; two were revised to TEA. In surviving implants, the range of motion at follow-up was markedly improved from preoperative motion. The MEPS for the remaining HA included five excellent results, three good results, five fair results, and one poor result.

Discussion: Elbow HA is an option for young or active patients with end-stage elbow posttraumatic arthritis who are unwilling to accept activity limitations. However, high rates of revision surgery and revision to TEA occur after HA for posttraumatic osteoarthritis of the elbow. Only 57% of patients with surviving implants had a good to excellent MEPS, although improvement in the range of motion was predictable.

Management of end-stage posttraumatic elbow arthritis in young and/or active patients is challenging.[1-3] Management options include activity modification, oral analgesics, injections, or surgery. Surgical options can range from open or arthroscopic débridement, interposition arthroplasty, elbow arthrodesis, or prosthetic joint replacement. Total elbow arthroplasty (TEA) may be considered, but profound life-long functional and activity restrictions are required postoperatively. Additionally, high rates of revision and clinical failure have been reported,[4,5] which contraindicates this option in younger patients unwilling to accept activity constraints. Distal humerus hemiarthroplasty (HA) has been considered for these patients. Advantages of HA include preservation of ulnar and radial bone stock, decreased risk of component loosening, absence of polyethylene

Table 1

Population Description	
Mean age at surgery (yr)	45 (16-63)
Sex	
Male	6 (37.5%)
Female	10 (62.5%)
Dominant arm	12 (75%)
Mean BMI	29 (20-40)
Mean surgical time (min)	215 (88-393)
Diagnosis	
Posttraumatic	16
Nonunion	7 (39%)
Arthritis	6 (33%)
Bony ankylosis	2 (11%)
Persistent fracture-dislocation	1 (6%)
Delay between trauma and HA (mo)	18 (1-84)
Patients who underwent a previous procedure	16 (100%)
Mean number of previous procedures per patient	1.5 (1-3)
ORIF	13 (81%)
CRPP	1 (6%)
Ulnar nerve transposition	4 (25%)
Hardware removal	3 (19%)
Arthroscopic débridement	1 (6%)
Heterotopic bone removal	2 (12%)
Approach	
Olecranon osteotomy	6 (38%)
Extended Kocher	3 (19%)
Bryan-Morrey	4 (25%)
Lateral epicondyle osteotomy	2 (12%)
TRAP	1 (6%)

BMI = body mass index, CRPP = closed reduction and percutaneous pinning, HA = humerus hemiarthroplasty, ORIF = open reduction and internal fixation, TRAP = triceps-reflecting anconeus pedicle

wear, and decreased surgical time with a possible decrease in infection risk. HA of the elbow has most commonly been used for management of unreconstructable acute distal humerus fractures,[6-11] with far fewer reports on nonacute fractures.[6,10,12] At midterm follow-up, these small series have shown modest results. However, these results remain similar to TEA with multiple theoretical advantages.

We hypothesize that, in those patients who are are unwilling to accept the limitations of a TEA, distal humerus HA may be successfully used to treat patients with sequelae of previously treated distal humerus fractures. This study reviews our experience with HA for posttraumatic arthritis with a minimum 2-year follow-up to determine the results, complications, and rate of revision.

Methods

After obtaining approval from the Institutional Review Board, we retrospectively identified all patients who had undergone primary elbow HA for posttraumatic arthritis with a minimum 2-year follow-up. Since 1969, a database containing all joint arthroplasties at our institution has enrolled and followed patients. Using this system, 18 primary elbow HAs were identified between January 1, 2002, and December 31, 2012. Of these, 2 were lost to follow-up before 2 years, leaving 16 elbows meeting inclusion criteria. These 16 elbows were included in the clinical analysis. No external source of funding was used for any aspect of this study.

Surgical Procedure

The prostheses used were Latitude humeral stems (Tornier) in 6 patients and Sorbie-Questor humeral stems (Wright Medical Technology) in 10 patients.[13] The joint was approached by an olecranon osteotomy in six patients. This was associated with a lateral epicondyle osteotomy in two patients. Four of the olecranon osteotomies were fixed by an olecranon plate and two by an olecranon rod (Acumed). The other approaches comprised four Bryan-Morrey approaches, three extended Kocher approaches, two lateral epicondyle osteotomies, and one triceps-reflecting anconeus pedicle approach. The ulnar nerve was identified, decompressed, and protected. Corticocancellous bone graft from the distal humerus was used in six patients (38%) and placed under the anterior flange for the Latitude humeral stems. All humeral stems were cemented with antibiotics in cement. Drains were used in all patients.

Postoperatively, patients were placed in a splint at 90° for 2 weeks, followed by gradual elbow mobilization of flexion and extension. At 2 weeks, patients were allowed to return to daily activities with a 5 lbs. restriction and advised to avoid forceful elbow extension. Full unrestricted activity was allowed with osteotomy healing or 3 months postoperatively when no olecranon osteotomy was performed.

Clinical Outcomes

Information including demographic data, pre- and postoperative clinical course, complications, and revisions was abstracted from the medical record. Pre- and postoperative range of motion was assessed using a goniometer, and pre- and postoperative pain was graded according to the scale used by the Mayo Elbow Performance Scores (MEPSs).[14] Postoperative MEPSs were calculated. MEPSs above 90 were considered excellent, between 75 and 89 good, between 60 and 74 fair, and below 60 poor.

Radiographic Evaluation

Postoperative AP and lateral radiographs were reviewed to determine healing of the surgical osteotomy site or bone graft union to the anterior humerus for anterior flanged prostheses, implant status (loosening), instability, the presence of spurs and their progression, localization of degenerative changes (specifically ulnar or radial wear), and the presence and extent of heterotopic ossification (HO). Bone graft union to the anterior humerus was determined on lateral views and classified into following five categories: 0% to 25% (grade 1), 25% to 50% (grade 2), 50% to 75% (grade 3), 75% to 100% (grade 4), and 100% (grade 5). HO was classified into three categories according to the Hastings classification[7]: HO with no functional deficit (grade 1), HO with decreased range of motion (grade 2), and bridging ankylosis (grade 3). Ulnar wear was assessed on AP views, and radial wear was determined on lateral views by comparing immediate postoperative radiographs with the most recent radiographs. Cartilage loss was assessed by evaluation of the ulnohumeral and radiocapitellar joint space. Narrowing of the joint space was considered to be consistent with cartilage loss as described by Smith and Hughes.[15] Wear was classified into following four categories: none (grade 0), partial-thickness cartilage loss (grade 1), total-thickness cartilage loss (grade 2), and bone erosion (grade 3). Periprosthetic lucency was graded as 0 (no line or <1 mm incomplete), 1 (1 to 2 mm incomplete), 2 (>2 mm incomplete), 3 (>2 mm complete), or 4 (gross loosening).

Table 2

Pre- and Postoperative Evaluation

Factor	Preoperative	Postoperative	*P* Value
Pain			
None	3 (19%)	3 (19%)	—
Mild	2 (12%)	5 (31%)	—
Moderate	0 (0%)	5 (31%)	—
Severe	11 (69%)	3 (19%)	—
Mean pain	3.2	2.5	0.06
Mean range of motion			
Extension	51	27	<0.01
Flexion	97	118	0.01
F/E arc	45	91	0.01
Pronation	62	74	0.21
Supination	58	55	0.81
P/S arc	120	129	0.61
Stability			
Stable	13 (81%)	11 (69%)	—
Moderately	0 (0%)	4 (25%)	—
Grossly	3 (19%)	1 (6%)	—
Global outcome			
Excellent	0 (0%)	5 (31%)	—
Good	0 (0%)	3 (19%)	—
Fair	4 (25%)	5 (31%)	—
Poor	12 (75%)	3 (19%)	—
Mean MEPS		72	—

F/E arc = flexion/extension arc, MEPS = Mayo Elbow Performance Score, P/S arc = pronation-supination arc

Statistical Analysis

Descriptive statistics are described as mean (range) for continuous measures and number (percentage) for discrete variables. Pre-versus postoperative changes in pain and in the range of motion were assessed using a non-parametric signed-rank Wilcoxon test. The alpha level for all tests was set at 0.05 for statistical significance.

Results

Clinical Outcome

Mean patient age in this series was 45 years (range, 16 to 63 years) at

Table 3

Details of All Patients Included in the Study

Patient	Age (yr)	Sex	Diagnosis	Implant Type	Approach
Patient 1	45	Male	Distal humerus nonunion	Latitude	Olecranon osteotomy
Patient 2	29	Female	Arthritis	Latitude	Bryan-Morrey
Patient 3	35	Male	Bony ankylosis	Latitude	Olecranon osteotomy
Patient 4	63	Female	Persistent fracture-dislocation	Latitude	Bryan-Morrey
Patient 5	53	Female	Distal humerus nonunion	Latitude	TRAP
Patient 6	49	Female	Arthritis	Sorbie	Olecranon osteotomy
Patient 7	52	Female	Distal humerus nonunion	Sorbie	Lateral epicondyle osteotomy
Patient 8	59	Male	Distal humerus nonunion	Sorbie	Olecranon osteotomy
Patient 9	31	Male	Arthritis	Sorbie	Olecranon osteotomy
Patient 10	24	Male	Bony ankylosis	Sorbie	Bryan-Morrey
Patient 11	60	Female	Arthritis	Sorbie	Extended Kocher
Patient 12	16	Male	Arthritis	Sorbie	Lateral epicondyle osteotomy
Patient 13	51	Female	Distal humerus nonunion	Sorbie	Bryan-Morrey
Patient 14	55	Female	Arthritis	Sorbie	Extended Kocher
Patient 15	44	Female	Distal humerus nonunion	Latitude	Olecranon osteotomy
Patient 16	56	Female	Distal humerus nonunion; distal humerus osteonecrosis	Sorbie	Extended Kocher

HO = heterotopic ossification, MEPS = Mayo Elbow Performance Score, ORIF = open reduction and internal fixation, TEA = total elbow arthroplasty, TRAP = triceps-reflecting anconeus pedicle

the time of surgery, and follow-up averaged 51 months (range, 25 to 124 months). Two patients were lost to follow-up before 2 years. All elbows had previously undergone one or more surgical procedures at the elbow (average of 1.5 procedures). These included open reduction and internal fixation of distal humerus fractures (13), ulnar nerve transposition (4), total or partial hardware removals (3), heterotopic bone removals (2), arthroscopic débridement (1), and closed reduction and percutaneous pinning of distal humerus fractures (1). Mean time between the trauma and HA was 18 months (range, 1 to 84 months), as detailed in Table 1. Preoperative MEPSs were fair in 4 elbows (25%) and poor in 12 elbows (75%) (Table 2).

Mean postoperative MEPS was 72 (range, 10 to 100). According to the MEPSs at the latest follow-up, results were excellent in 5 patients (31%), good in 3 (19%), fair in 5 (31%), and poor in 3 (19%), as described in detail in Tables 2 and 3.

Mean flexion/extension arc was significantly improved from 45° to 91° ($P < 0.01$). Flexion contractures improved from a mean of 51° preoperatively to 27° postoperatively ($P < 0.01$). Flexion improved from a mean of 97° preoperatively to 118° postoperatively ($P = 0.01$). Pro-supination arc was not significantly improved ($P = 0.6$). Pain decreased from 3.2 to 2.5, but this did not reach significance ($P = 0.06$). However, the number of patients with severe pain decreased significantly from 11 to 3 ($P < 0.01$).

When eliminating patients who were revised to TEA, the range of motion and pain at follow-up were both significantly improved ($P < 0.01$ and $P < 0.05$, respectively). According to the MEPSs at the last review, results were excellent in 5 patients (36%), good in 3 (21%), fair in 4 (29%), and poor in 2 (14%). Full results are presented in Table 4.

Radiographic Outcome

Seven patients (44%) had a preoperative loss of subchondral bony architecture (Figure 1). It affected the trochlea in three patients, the capitellum in two patients, the proximal ulna in one patient, and both columns in one patient. Only two patients (12%) had a preoperative axial alignment deformity (>30° of varus). Both these were aligned in varus (31° and 43°). Four patients (25%) had preoperative subluxation (two had subluxation of the entire elbow joint and two had isolated subluxation of the radial head), and one patient had a persistent radiocapitellar fracture-dislocation. Postoperatively, the progression of preoperative degenerative changes was observed in seven patients (44%); these were localized to the

Table 3 *(continued)*

Details of All Patients Included in the Study

Follow-up (mo)	Postop Extension	Postop Flexion	Postop MEPS	Complication	Revision Surgery
35	10	120	85	Broken screw	None
25	30	150	70	None	None
34	30	90	90	Intraoperative ulnar fracture; symptomatic HOs	ORIF of ulnar fracture; HO removal
75	30	120	90		
84	10	110	80	Ulnar nerve neuropathy	
55	30	120	60		
61	40	110	60		
124	0	150	100		
26	65	85	10	Seroma	Drainage of seroma
28	30	150	100		
64	30	140	85		
26	50	100	80		
60	30	60	55		
34	0	150	65		
73	40	105	45	Persistent elbow pain; ulnar nerve neuropathy	Revision to TEA; ulnar nerve neurolysis
17	10	130	70	Septic humeral loosening	Two-stage revision to TEA

HO = heterotopic ossification, MEPS = Mayo Elbow Performance Score, ORIF = open reduction and internal fixation, TEA = total elbow arthroplasty, TRAP = triceps-reflecting anconeus pedicle

radiocapitellar joint in most cases (4 patients, 25%). Among the six patients who had been treated with a flanged humeral stem (Latitude; Tornier, Bloomington, MN), and who therefore had received a bone graft, 2 (33%) had a complete healing of the graft and 3 (50%) had less than 25% union of the graft at the last follow-up. All olecranon osteotomies healed. HO developed in three patients (19%). This was classified as grade 2 (one elbow) and grade 1 (two elbows). No HO affected the final range of motion.

All patients had radiographic evidence of wear at the native proximal radius and/or ulna. Ulnar erosion was observed in nine patients (56%). Six patients (38%) had no bony erosion but had full-thickness loss of cartilage on the ulna, and 1 (6%) had partial-thickness loss of cartilage. Wear on the radial side was less severe, as six patients (38%) presented with bone erosion, 5 (31%) with full-thickness loss of cartilage, and 5 (31%) with partial-thickness loss of cartilage. At the final follow-up, seven patients (44%) had no periprosthetic radiolucent lines, but 2 (12%) had gross loosening of the humeral stem (Table 5 and Figure 2).

Complications and Revisions

One patient (6%) had an intraoperative complication and 8 (50%) had postoperative complications. At the final follow-up, five patients (31%) had undergone six additional surgeries. Among these, 2 (13%) were revisions to TEA, as detailed in Table 6. The indications for revisions were septic loosening (n = 1) and persistent pain (n = 1).

Discussion

Management of posttraumatic arthritis of the elbow in young and/or active patients presents a challenge. HA of the elbow has been proposed in this patient population as a treatment option. However, there are limited data in the existing literature regarding indications and outcomes in the setting of posttraumatic arthritis.[11,12,15-19] Some series describe the use of HA in acute comminuted fractures of the distal humerus in elderly patients[11,16,17,20] and suggest better functional results compared with open reduction and internal fixation with a shorter surgery and less complications. For others, the main indication for HA over TEA is for young or active patients, given that HA is not subject to the same postoperative restrictions as TEA.[12,15,19] Table 7 outlines the available literature supporting the use of elbow HA. This series shows that distal humeral HA is also an option for young patients with posttraumatic arthritis. However,

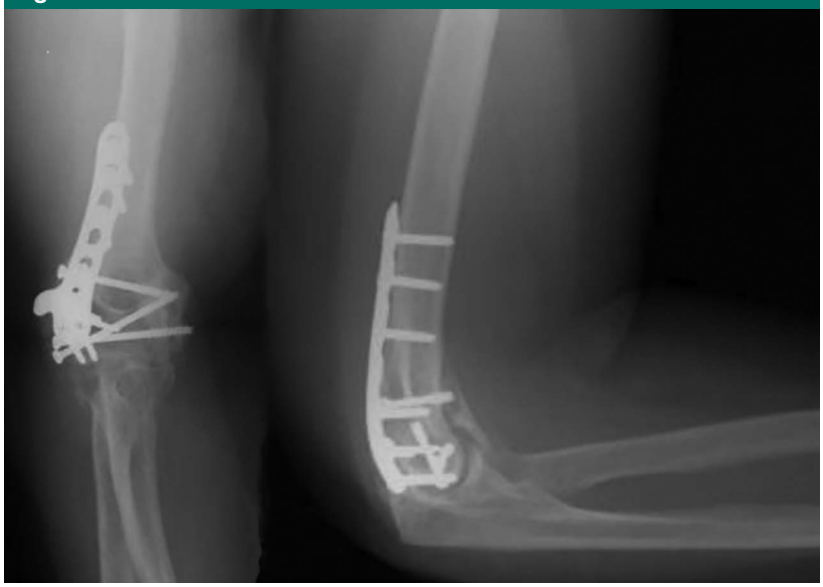
Table 4

Pre- and Postoperative Evaluation of Implants That Were Not Revised

Factor	Preoperative	Postoperative	*P* Value
Pain			
None	3 (21%)	3 (21%)	—
Mild	2 (15%)	5 (36%)	—
Moderate	0 (0%)	5 (36%)	—
Severe	9 (64%)	1 (7%)	—
Mean pain	3	2.3	0.04
Mean range of motion			
Extension	53	28	<0.01
Flexion	96	118	0.02
F/E arc	43	90	<0.01
Pronation	60	73	0.23
Supination	57	55	0.89
P/S arc	117	128	0.58
Stability			
Stable	11 (79%)	10 (72%)	—
Moderately	0 (0%)	3 (21%)	—
Grossly	3 (21%)	1 (7%)	—
Global outcome			
Excellent	0 (0%)	5 (36%)	—
Good	0 (0%)	3 (21%)	—
Fair	3 (21%)	4 (29%)	—
Poor	11 (79%)	2 (14%)	—
Mean MEPS		73	—

F/E arc = flexion/extension arc, MEPS = Mayo Elbow Performance Score, P/S arc = pro-supination arc

Figure 1



A 60-year-old woman who had sustained a fracture-dislocation 7 months previously had it treated unsuccessfully with reduction and fixation. She had mild pain but an arc of flexion of 85° to 90°. AP and lateral radiographs were made before the elbow hemiarthroplasty.

the results should be interpreted with extreme caution as this operation still has a high rate of complications and revisions with modest levels of final functional outcomes. Despite these risks, HA may be acceptable in this population given the high rate of revision with TEA in the younger population and remaining option to covert to a TEA at a later time.[21]

We traditionally prefer TEA over HA for elderly patients or low-demand patient populations, as TEA reliably provides good functional results in these populations. In this series, we chose to consider HA in young or active patients with posttraumatic arthritis with a goal of not requiring any postoperative restrictions. In addition to the weight-bearing restrictions of a TEA, a young active patient who undergoes a TEA may potentially have multiple revisions over their lifetime.[1,14] With these potential outcomes in mind, this series of patients with posttraumatic elbow OA were treated with HA due to their young and/or active lifestyle (average age, 45 years; range, 16 to 63 years).

Many patients with posttraumatic elbow arthritis are unwilling to accept the restrictions necessary after TEA. In this high-demand population, surgical treatment options include open or arthroscopic débridement, interposition arthroplasty, and implant arthroplasty. Débridement is best for patients with pain at the end arcs of motion rather than for patients with pain throughout the arc of motion, which suggests widespread articular involvement.[4] Interposition arthroplasty is a technically challenging procedure and is contraindicated in case of substantial bone loss or deformity, which was present in our series in 9 patients (56%). Interposition arthroplasty in general does not restore full elbow range of motion nor provide complete pain

relief.[22,23] It can also lead to severe instability in case of preoperative bony deformity[24] and should be thought of as a temporizing measure in young patients who cannot or should not undergo TEA.[23] Schneeberger et al[5] reported the results of TEA for posttraumatic arthritis in 41 patients (average age, 57 years; range, 32 to 82 years) with a mean follow-up of 68 months (range, 24 to 144 months). Celli et al[1] reported the results of TEA in 49 patients younger than 40 years (average age, 33 years) with a mean follow-up of 91 months (range, 24 to 242 months). They both showed that in this patient population, TEA provides satisfactory results with a good restoration of function and pain relief. However, these results must be balanced against the expected physical limitations in the younger more active population that can be expected to have more demanding requirements of the elbow. In a series of TEA in patients younger than 50 years, Schoch et al[21] reported an 82% revision surgery rate at a mean of 2.5 years after primary arthroplasty. Therefore, surgeons must be cautious when considering surgery in this younger population who may be less likely to comply, resulting in high rates of mechanical failure and revision surgery.

Our study remains limited by the number of patients, and our small sample size may have led to us being unable to detect a difference in pain from pre- to postoperatively. These operations were also over a 10-year period and included a prosthesis that is no longer available (Sorbie). These limitations are unavoidable because of the rarity of indications for elbow HA. In addition, the procedures were performed by four different surgeons who performed different surgical approaches. The Sorbie-Questor humeral stem can be implanted without taking down the triceps, while the Latitude humeral stem requires a TEA-type approach. Many surgeons are doing this with the triceps on[25]; however, no differences were found between the different approaches. No cases of

Table 5

Radiologic Assessment at Last Follow-up

Factor	*n* (%)
Ulnar wear	
0: none	0 (0)
1: partial-thickness cartilage loss	1 (6)
2: full-thickness cartilage loss	6 (38)
3: bone erosion	9 (56)
Radial wear	
0: none	0 (0)
1: partial-thickness cartilage loss	5 (31)
2: full-thickness cartilage loss	5 (31)
3: bone erosion	6 (38)
Loosening	
0: no line or <1 mm incomplete	7 (44)
1: 1-2 mm incomplete	3 (19)
2: >2 mm incomplete	4 (25)
3: >2 mm complete	0 (0)
4: gross loosening	2 (12)

Figure 2

Lateral and AP radiographs made 5 years postoperatively. The patient had a good result with mild pain and an arc of flexion of 30° to 140°. The implant was stable without signs of loosening but with radial and ulnar bone erosion.

Table 6

Complications and Revisions

Complication	*n*	Revision Surgery	Revision to TEA
Intraoperative complications			
Ulnar fracture	1		
Postoperative complications			
Ulnar nerve neuropathy	2		1 (and ulnar nerve neurolysis)
Broken hardware	1		
Septic loosening	1	1 (antibiotic cement spacer)	1
Symptomatic HO	1	1 (HO excision)	
Ulnar fracture	1	1 (ORIF of ulnar fracture)	
Wound drainage	1		
Seroma	1	1 (drainage of seroma)	

HO = heterotopic ossification, ORIF = open reduction and internal fixation, TEA = total elbow arthroplasty

Table 7

Previous Results of HA

Factor	Burkhart et al[17]	Adolfsson and Nestorson[20]	Argintar et al[11]	Swoboda and Scott[19]	Smith and Hughes[15]	Hohman et al[9]
No. of patients	10	8	10 (1 excluded)	7 (1 excluded)	26 (9 excluded)	8
Mean age (yr)	75.2 (62-88)	79	73.4 (56-77)	33 (20-50)	62 (29-92)	64 (33-75)
Etiology						
Fracture	8 (80%)	8 (100%)	9 (90%)	0 (0%)	21 (81%)	6 (75%)
Posttraumatic	2 (20%)	0 (0%)	1 (10%)	0 (0%)	5 (19%)	2 (25%)
Rheumatoid arthritis	0 (0%)	0 (0%)	0 (0%)	7 (100%)	0 (0%)	0 (0%)
Follow-up (mo)	12.1 (6-23)	54 (30-72)	12	67 (25-109)	80 (25-133)	36
Pain						
None	8 (80%)	7 (88%)	—	4 (67%)	—	—
Mild	1 (10%)	1 (12%)	—	2 (33%)	—	—
Moderate	1 (10%)	0 (0%)	—	0 (0%)	—	—
Severe	0 (0%)	0 (0%)	—	0 (0%)	—	—
Mean pain	1.3	—	—	1.3	—	17/50 (ASES)
Mean range of motion						
Extension	17.5 (0-44)	31 (15-55)	21.7 (0-45)	50 (40-85)	17	19 (5-30)
Flexion	124.5 (5-30)	126 (115-135)	121 (40-140)	114 (86-150)	F/E arc 116	120 (90-135)
Pronation	80.5 (60-90)	No limitation	64 (40-80)	53 (15-80)	83 (20-90)	87 (80-100)
Supination	79.5 (50-90)	No limitation	69 (60-80)	60 (15-80)	83 (-10-90)	73 (60-90)
Final outcome						
Excellent	8 (80%)	5 (62%)	3 (33%)	—	—	1 (12/5%)
Good	1 (10%)	3 (38%)	2 (22%)	—	—	3 (37.5%)
Fair	1 (10%)	0 (0%)	3 (33%)	—	—	2 (25%)
Poor	0 (0%)	0 (0%)	1 (12%)	—	—	1 (12/5%)
Mean MEPS	91.3 (60-100)	90.6 (85-95)	77.2 (55-100)	—	90.4 (55-100)	75 (50-95)
Revision	1 (10%)	1 periprosthetic fracture (12%)	0 (0%)	1 (14%)	4 (15%)	0 (0%)

ASES = American Shoulder and Elbow Society, F/E arc = flexion/extension arc, HA = humerus hemiarthroplasty, MEPS, Mayo Elbow Performance Score

nonunion of the olecranon osteotomies were observed. One case of gross instability was found at the last follow-up in one of the patients who had had a lateral epicondyle osteotomy. Two different implants were used, but our numbers were too small to find any notable difference between them.

The current study suggests that elbow HA could be an alternative for young active patients with posttraumatic arthritis of the elbow. HA of the elbow addresses widespread cartilage changes and articular step-off, presents no functional limitations, and does not exclude the possibility of revision to a TEA in case of failure. We also noted a markedly improved range of motion and a low rate of mechanical failure. However, a high rate of complications was observed (10 patients, 63%), although most of the reported complications were minor. It is sobering that a high rate of revision to TEA (13%) was seen. Nevertheless, in patients with surviving implants, 57% good to excellent MEPS and notable improvements in the range of motion may be seen. This complication rate may be acceptable for some patients given the high complication seen with TEA and the associated restrictions.[1,21] When approached cautiously, elbow HA can be considered an option for young or active patients with end-stage arthritis in whom alternative procedures have failed or there are few other options available. When performing this operation, patients should also be followed due to progressive wear on the native proximal radius and ulna.

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