Management of Geriatric Elbow Injury

Naoko Onizuka, MD, PhD, MPH\textsuperscript{a,b}, Julie Switzer, MD\textsuperscript{a,b}, Chad Myeroff, MD\textsuperscript{c,*}

**KEYWORDS**
- Geriatric trauma
- Elderly
- Elbow trauma
- Distal humerus fracture
- Olecranon fracture
- Elbow dislocation
- Terrible triad injury
- Radial head fracture

**KEY POINTS**
- Approximately 4.1% of all fractures in the elderly involve the elbow.
- Most elbow injuries in geriatric patients occur as the result of low-energy mechanisms such as falls from standing height.
- Elbow injuries in elderly patients present complex challenges because of insufficient bone quality, comminution, articular fragmentation, and preexisting conditions, such as arthritis.
- Medical comorbidities and baseline level of function must be heavily considered in surgical decision making.

**MANAGEMENT OF GERIATRIC ELBOW TRAUMA**

**Introduction**
Approximately 4.1% of fractures in the elderly involve the elbow.\textsuperscript{1} Elderly patients are at risk for elbow injuries following low-energy falls. Such injuries occur secondary to deconditioning, muscle weakness, gait and balance deficits, poor vision, and concomitant osteopenia or osteoporosis.\textsuperscript{2} In 1 study of 287 patients, it was determined that nearly 70% of patients who sustain an elbow fracture fall directly onto their elbow because they cannot break the fall with an outstretched arm.\textsuperscript{3} Older patients with elbow trauma tend to be more fit than those with proximal humerus fractures but less fit than those with distal radius fractures.\textsuperscript{3} Regardless of a patient’s underlying state of health or age, elbow injuries in the elderly can impact mobility, function, and ultimately, independence.

**DISTAL HUMERUS FRACTURE**

**Epidemiology**
Distal humerus fractures comprise approximately 2% of all fractures but represent one-third of elbow fractures.\textsuperscript{1} Distal humeral fractures have an estimated incidence of 5.7 per 100,000 persons per year.\textsuperscript{4} Most distal humerus fractures in geriatric patients occur from low-energy injuries, such as falling from standing height.\textsuperscript{5} They have a bimodal age distribution, with peak incidences between 12 and 19 years and those aged 80 years and older.\textsuperscript{6}

**Clinical Assessment**
It is imperative to understand the patient’s medical and physical frailty and level of independence, including gait assistance, living situation, and level of function. The physical evaluation includes assessing the ipsilateral shoulder and wrist. Skin needs to be carefully examined for abrasions, fracture blisters, skin tenting, and open wounds.\textsuperscript{7} Open elbow injuries are common and should be treated with standard open fracture protocols that involve removing gross contamination, soft tissue coverage, splinting, early antibiotics, and timely surgical irrigation and debridement.\textsuperscript{7,8} Neurologic examinations must be performed and accurately documented preoperatively and postoperatively. Incomplete

\textsuperscript{a} Department of Orthopaedic Surgery, University of Minnesota, 2512 South 7th Street, Suite R200, Minneapolis, MN 55455, USA; \textsuperscript{b} Department of Orthopaedic Surgery, Methodist Hospital, 6500 Excelsior Boulevard, Saint Louis Park, MN 55426, USA; \textsuperscript{c} TRIA Orthopedic Center, 155 Radio Drive, Woodbury, MN 55125, USA
\* Corresponding author.
E-mail address: Chad.M.Myeroff@healthpartners.com

Orthop Clin N Am \textsuperscript{a} (2021) \textsuperscript{b}
https://doi.org/10.1016/j.ocl.2021.05.009
0030-5898/21/© 2021 Elsevier Inc. All rights reserved.
Ulnar neuropathy is present in 26% of patients with Arbeitsgemeinschaft für Osteosynthesefragen/Orthopaedic Trauma Association (AO/OTA) type C distal humerus fractures at the time of presentation. Vascular injuries should be ruled out by examining the distal pulses, capillary refill, and color.

**Imaging**

Standard anteroposterior and lateral radiographs of the elbow are necessary for diagnosis, classification, and surgical templating. Radiographs of the joints above and below are essential as concomitant distal radius fractures are not uncommon (case 2, see Fig. 5; case 3, see Fig. 10). In elderly patients who have highly comminuted fractures, a computed tomographic (CT) scan is helpful to identify and visualize fracture patterns.

**Classifications**

There are several classification systems, but the AO/OTA classification is used most frequently (Fig. 1). Type A fractures are extra-articular and may involve the epicondyles or occur at the distal humerus metaphyseal level. Type B fractures are partial articular and include unicodylar fractures or fractures of the articular surface involving the capitellum, trochlea, or both. Type C fractures are complete articular fractures. In type C fractures, there is no continuity between the articular segments and the humeral shaft.

**Treatment**

The treatment of distal humerus fractures in older patients can be challenging. High degrees of comminution, insufficient bone stock, underlying osteoarthritis, and preexisting medical comorbidities weigh heavily on treatment decision making.

**Nonoperative treatment**

Nonoperative treatment is generally reserved for patients who are medically unfit to undergo surgery. In patients for whom anesthesia or surgery-related risks are too high, conservative treatment is considered to be appropriate. Low-demand patients with severe osteoporosis, patients with poor-quality skin, or patients with nondisplaced fractures may also be managed with nonoperative management (case 1, see Fig. 1; Figs. 2 and 3). They can be managed with immobilization for 2 to 3 weeks followed by early mobilization.

**Open reduction and internal fixation**

In the active patient, nonoperative treatment often results in loss of function and disability because of prolonged immobilization. Nauth and colleagues demonstrated that patients treated nonoperatively have almost 3 times the risk of an unacceptable result (relative risk = 2.8, 95% confidence interval, 1.78–4.4). In a study of 497 patients, Obert and colleagues reported the conservative treatment group’s complication rates were 60%. In this analysis, the main complication was malunion. Thus, anatomic reduction and rigid internal fixation with early physiologic motion is considered the gold standard for most fractures of the distal humerus (case 2, Figs. 4–7).

Good to excellent outcomes of open reduction and internal fixation (ORIF) for distal humerus fractures in elderly patients have been reported. A retrospective cohort study of distal humerus fractures in patients older than 70 years of age reported an average flexion arc of 20.9° to 127°, average pronation and supination of 68.3° and 75.3°, respectively, and a mean Mayo Elbow Performance Score (MEPS) of 88.7. Similarly, Ducrot and colleagues retrospectively studied 43 elderly patients (mean age of 80) who were treated with locking plate fixation. They reported a mean flexion arc of 23° to 127° and satisfactory functional recovery, with 95% good and excellent results. Clavert and colleagues reported satisfactory results with a mean MEPS of 87 in elderly patients with ORIF. Complication rates were reported in a wide range (19% to 53%) and included neuropathies, mechanical failure, elbow stiffness, nonunions, deep infections, or wound dehiscence.

An olecranon osteotomy is commonly used for AO/OTA type C fractures, as it allows visualization of the distal humerus articular surface. The complications associated with an osteotomy include nonunion/malunion (3.3%) and hardware irritation (10%–82%). Kaiser and colleagues reported a limited columnar fixation and olecranon-sparing approach for intraarticular fractures in an elderly population as a valid treatment option with similar elbow motion, function, and pain relief when compared with ORIF with an osteotomy. This approach may be used in geriatric patients who are medically unwell or who have such poor bone quality that anatomic reduction with an olecranon osteotomy would be challenging. Avoiding an osteotomy may allow not only more aggressive rehabilitation but also arthroplasty as an intraoperative fallback.
Total elbow arthroplasty

Distal humerus fractures present complex challenges in the elderly patient because of osteopenia, comminution, articular fragmentation, and preexisting conditions of the elbow, such as osteoarthritis or rheumatoid arthritis. In those patients with these common diagnoses, rigid internal fixation and early mobilization can be challenging. In certain low, transcolumnar or coronal shear fractures in older patients with severe osteopenia, comminution, or preexisting arthritis, total elbow arthroplasty (TEA) has become a recognized alternative treatment. However, it is imperative to choose only low-demand patients for this intervention to minimize risk of failures, such as loosening, polyethylene wear, and periprosthetic fracture. The evidence for patient selection, complications, and functional outcomes is still conflicting.\textsuperscript{15,43–49}

As a principle, it is recommended to perform ORIF on all adult patients fit for surgery with a reconstructible fracture pattern to reserve TEA for low-demand patients with unreconstructible fractures (case 3, Figs. 8–12). Several studies have compared ORIF and TEA for distal humerus fractures. However, sample sizes in these studies were limited, and inconsistent results have been reported. Egol and colleagues\textsuperscript{46} reported good outcomes with either TEA or ORIF with no significant difference in functional outcomes, whereas McKee and colleagues\textsuperscript{50} and Morrey\textsuperscript{51} reported TEA had improved functional outcomes based on the MEPS and concluded TEA is a preferred alternative in elderly patients with complex distal humeral fractures. Varecka and Myeroff\textsuperscript{52} reported that the outcomes of TEA for distal humerus fracture in the elderly included a physiologic range of motion (ROM; 26°–125°), adequate function (average MEPS, 87), and an acceptable implant survival rate of 94% at an average of 38.5 months. Although it has been reported that patients who undergo ORIF have a

![Fig. 1. The AO/OTA classification of distal humerus fractures.](image-url)
Case 1: a 60-year-old woman with a past medical history of cerebrovascular disease with diminished right upper-extremity function sustained a low-energy fall. She had an extra-articular right distal humerus fracture (see Fig. 2). Originally, surgery was planned, but the soft tissue was not suitable with perceived high risk of deep infection. The patient’s bone quality was poor, and the reliability of fixation was a concern. She underwent nonsurgical treatment with 3 weeks of splint and then a removable brace for another 3 weeks.

Case 1: A 60-year-old woman with radiographs at 3-month visit. Elbow ROM was 10° to 95°, supination 20°, pronation 90° at the 3-month visit.
Case 2: A 59-year-old woman who presented 6 days after a fall on ice, in which she sustained a right elbow injury. The radiograph revealed a right distal humerus intraarticular fracture (see Fig. 4) and right distal radius fracture (see Fig. 5). She underwent distal humerus ORIF with dual plating and olecranon osteotomy (see Fig. 6) and distal radius ORIF (see Fig. 7). She had an anterior subcutaneous transposition of the ulnar nerve but required a transfer of her anterior interosseous nerve to her right ulnar motor nerve for ulnar neuropathy.
Fig. 6. Case 2: A 59-year-old woman with elbow ROM of 26° to 132°, supination 90°, pronation 90° at 10 months postoperatively.

Fig. 7. Case 2: A 59-year-old woman.
higher risk of complications compared with TEA, complications with TEA are often more severe. The complications with TEA include periprosthetic fracture (1%), implant fracture (1%), and deep wound infection (2%).

Thus, although TEA may provide improved early function and similar overall outcomes when compared with ORIF in appropriately selected patients, it can cause devastating complications, and appropriate hosts must be carefully selected.

OLECRANON FRACTURES

Epidemiology
Fractures of the olecranon account for 20% of all proximal forearm fractures and 10% of all upper-extremity fractures. The common mechanism is a direct fall onto the elbow. For isolated fractures of the olecranon, the Mayo classification (Fig. 13) is preferred.

Management

Nonoperative treatment
Closed treatment is the gold standard in elderly, low-demand patients with displaced and nondisplaced, isolated olecranon fractures. Several studies have reported excellent functional results and championed nonoperative management of displaced olecranon fractures as a viable treatment option for lower-demand patients with multiple comorbidities. Duckworth and colleagues conducted a retrospective cohort study of 43 elderly patients with isolated Mayo-2 olecranon fracture (mean displacement, 10 mm) who underwent nonoperative treatment. They showed nonoperative management of displaced olecranon fractures to be a viable treatment option for lower-demand patients with multiple comorbidities with a flexion arc of 18° to 126°, Disabilities of the Arm, Shoulder, and Hand (DASH) 2.9, 91% satisfaction, 17% push-off weakness despite an 88% nonunion (or fibrous union) rate. In a similar
study, Gallucci and colleagues\textsuperscript{58} reported 4/5 push-off weakness with nonoperative care. Subsequently, Duckworth and colleagues\textsuperscript{59} conducted a randomized trial of 19 olecranon fractures in the elderly (aged \( \geq 75 \) years) to compare nonoperative versus operative management (either tension-band wiring [TBW] or fixation with a nonlocking plate) and reported no difference in the mean DASH scores between the groups at all times, although the trial was stopped prematurely.

---

**Fig. 10.** Case 3: An 88-year-old woman.

**Fig. 11.** Case 3: An 88-year-old woman.
Fig. 12. Case 3: An 88-year-old woman.

Fig. 13. The Mayo classification for olecranon fracture.
as the rate of complications (9/11%, 81.8%; 6 patients had loss of reduction, 3 patients required removal of hardware, 1 patient required excision of draining sinus) in the operative group was considered to be unacceptable.\textsuperscript{59} It should be noted that no locking plate technology was used in the treatment of these short, metaphyseal fractures in the elderly despite the known unacceptable failure rate of TBW in this setting, reported previously by the same investigators and others.\textsuperscript{59}

**Operative treatment**

The goal in surgical management is anatomic reconstruction of the sigmoid notch in order to enable early functional rehabilitation of the elbow and thereby inhibit posttraumatic stiffness and optimize extension strength (case 4, Figs. 14 and 15). TBW or plate fixation is frequently used for stable displaced fractures (Mayo type II). However, there have been conflicting findings regarding the outcomes and complications after operative fixation of olecranon fractures in elderly patients. The TBW technique is an acceptable option in simple transverse fractures with an intact dorsal cortex in young patients with good bone (Mayo type IA-IIA). However, the biomechanical limitations become evident in comminuted fractures, and in osteoporotic bone. Umer and colleagues\textsuperscript{60} reviewed 79 operatively treated elderly olecranon fractures, in which TBW was used in 87%. They reported the following adverse outcomes, including 14% wound problems, 16% persistent pain, 44% hardware problems (19% hardware removal), and 75% stiffness.\textsuperscript{60} Duckworth and colleagues\textsuperscript{61} performed a randomized clinical trial comparing plate fixation to TBW in 67 patients. Despite being biased toward younger patients in the TBW group, TBW was associated with twice the complication rate (63% vs 38%; \( P = .042 \)), twice the hardware removal rate (50% vs 22%; \( P = .021 \)), and twice the loss of reduction (27% vs 13%; \( P = .206 \)). In a systematic review, Ren and colleagues\textsuperscript{62} found more complications for TBW when compared with plate fixation and therefore recommended olecranon fracture plating as the contemporary treatment of choice. Higher rates of prominent hardware with the need for removal following TBW were found in several studies over the last decade.\textsuperscript{63,64}

The management of comminuted and unstable fractures (Mayo IIb–IIIb) using locking compression plates via the dorsal approach has been well established in recent studies.\textsuperscript{65–68} Wise and colleagues\textsuperscript{68} reported low failure and complication rates using modern fixation principles and locked plating. They reported an 11% (4/36) major complication rate with only 3 mechanical failures, an 88% union rate (all patients who did not have a major complication went onto union), and a 120° flexion-extension arc of motion in their retrospective review of elderly

---

**Fig. 14.** Case 4: A 74-year-old woman with osteoporosis, diabetes, and hypothyroidism sustained a ground level fall resulting in a Mayo IIb olecranon fracture. She underwent ORIF with a triceps detensioning suture adjunct.
patients greater than 75 years old treated with locked plating and early motion. Interestingly, upper-extremity gait dependence was associated with failures. Although not the “gold standard,” precontoured locked plating and early mobilization is an effective and safe treatment for comminuted olecranon fractures in select geriatric patients, who are safe for surgery and comply with restrictions.66–68

In addition, especially for small tip fractures and/or in highly comminuted osteoporotic bone in the elderly, the use of an “off-loading triceps suture” (eg, with a nonabsorbable, high-tensile suture) has been shown to neutralize the distraction forces caused by the extensor mechanism and to decrease the risk of fixation failure.69

Most surgical complications are implant related because of soft tissue irritation. Complications such as ulnar neuropathy, deep infection, implant failure, or delayed/nonunion are relatively rarely reported. However, an uneven reconstruction of the articular surface can cause sequelae such as limited elbow ROM and post-traumatic arthritis.70

RADIAL HEAD FRACTURES

Epidemiology
Radial head fractures are the most common fractures of the elbow, with most fractures occurring in women older than 50 years of age. They constitute approximately one-third of all elbow fractures and approximately 2.5 to 2.8 per 10,000 people per year.71–74 Over the last decades, the radial head is increasingly recognized as an essential stabilizer of the elbow.75 Most radial head and neck fractures are minimally displaced and are isolated injuries. These fractures typically have a good functional outcome with nonsurgical treatment. More displaced and comminuted fractures commonly have associated injuries to the collateral ligaments. They may have associated fractures of the coronoid, capitellum, or proximal ulna as well.76

Assessment
A careful examination of an ROM is performed because the loss of forearm rotation is one of the primary indications for surgical intervention. In particular, the distal radioulnar joint and interosseous membrane should be palpated and assessed for both tenderness and instability.7 Anteroposterior and lateral radiographs are typically sufficient to diagnose most displaced radial head fractures. Nondisplaced fractures may initially be challenging to diagnose, and they may only be suspected by the presence of an anterior and posterior fat pad sign. CT can be helpful to characterize the size, location, and displacement of radial head fractures. It is also useful to assess concomitant injuries of the coronoid, the capitellum, and the presence of associated osteochondral fragments.7

Classification
Several classification systems have been used to describe radial head fractures. The Mason classification and its subsequent modifications are commonly used. Mason’s classification describes nondisplaced fractures (type I), partial fractures with displacement (type II), and comminuted and displaced fractures involving the entire radial head (type III) (Table 1).71 Morrey modified the Mason classification and included the extent of articular fragment displacement (>2 mm) and fragment size (≥30% of the articular surface) (Fig. 16).77 Johnston added a fourth
Treatment
Nonoperative treatment
Nondisplaced or minimally displaced radial head fractures without a block to forearm rotation are treated nonsurgically. The treatment includes immobilization for up to 2 or 3 days for comfort. Active motion is then encouraged with the use of a sling as needed between exercises. The natural course of Mason type I fractures is benign in general; however, persistent complaints have been reported in 20% of cases.

Operative treatment
Operative treatment is indicated for most of these unstable radial head injuries and any isolated fractures with significant articular displacement, articular comminution, or mechanical block to motion. Treatment options include radial head fragment excision, radial head excision, ORIF, and radial head arthroplasty. Fragment excision is indicated in patients with a block to forearm motion by a small (<25% of the articular diameter) non-reconstructible displaced articular fracture of the radial head with instability. Excision of any kind should never be performed in an instability pattern, and rarely, acutely. ORIF is indicated in patients with displaced, noncomminuted fractures of the radial head. In osteoporotic bone, even simple patterns can be fraught with impaction and relatively quick resorption. A radial head arthroplasty is the favored surgical treatment in patients with a comminuted (>3 parts) fracture, with poor bone quality, and with unstable elbow injuries or mechanical obstruction. Radial head replacement had fewer complications than ORIF patients (13.9% vs 58.1%) and higher satisfaction rates (91.7% vs 51.6%) in Mason type III radial head fractures patients.

ELBOW DISLOCATION/TERRIBLE TRIAD INJURY
Epidemiology
The elbow is the second most commonly dislocated joint in the adult population, with a reported rate of 5 to 6 per 100,000 person-years in the US population. Elbow dislocation associated with radial head and coronoid fractures has been referred to as the “terrible triad injury”; it represents a pattern of complex elbow instability that has historically been associated with a poor prognosis.

Mechanisms
Elbow dislocations are typically the result of a fall on an outstretched hand. The soft tissue injury begins on the lateral side of the elbow with the injury of the lateral collateral ligament (LCL) and then proceeds through the capsule to the medial side with the medial collateral ligament (MCL) being disrupted last. A fall onto an outstretched arm with supination, valgus, and

---

<table>
<thead>
<tr>
<th>Table 1</th>
<th>The Mason classification for radial head fractures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>Fissure or marginal fractures without displacement</td>
</tr>
<tr>
<td>Type 2</td>
<td>Marginal sector fractures with displacement</td>
</tr>
<tr>
<td>Type 3</td>
<td>Comminuted fractures involving the whole head of the radius</td>
</tr>
</tbody>
</table>

---

Fig. 16. The Broberg-Morrey modification of the Mason classification.
Axial-directed force is a mechanism of terrible triad injury. It occurs by posterolateral rotatory displacement of the ulna, resulting in elbow subluxation or dislocation, a shear fracture of the coronoid with LCL injury, and radial head fracture.7

Treatment

Elbow dislocations

A relative consensus exists in favor of conservative treatment of simple elbow dislocations in the absence of any tendency to re-dislocate within the joint’s functional arc.93–95 Previous studies have reported good to excellent outcomes in most patients with a simple elbow dislocation.93–95

However, some research reported mild residual symptoms, including loss of motion, subjective stiffness, residual pain, and residual instability.96–99 Prolonged immobilization after injury was associated with a worse result with increased flexion contracture and more severe axial-directed force is a mechanism of terrible triad injury. It occurs by posterolateral rotatory displacement of the ulna, resulting in elbow subluxation or dislocation, a shear fracture of the coronoid with LCL injury, and radial head fracture.7

Fig. 17. Case 5: An 82-year-old woman who presented to clinic 10 days after a fall from standing height, sustaining a simple right elbow dislocation (see Fig. 15). The elbow was reduced, and a splint was applied (see Table 1). At 1 week follow-up, she was found to have a recurrent dislocation (see Fig. 16). She underwent closed reduction, and an external fixator was placed at 90° of flexion for 4 weeks (see Fig. 17; Fig. 18). Final ROM resulted in a flexion arc of 10° to 140°, pronation 90°, and supination 90°.

Fig. 18. Case 5: An 82-year-old woman.
Fig. 19. Case 5: An 82-year-old woman.

Fig. 20. Case 5: An 82-year-old woman.
residual pain. The frailest patients are often quick to look past subtle functional losses but are vulnerable to loss of independence secondary to pain or instability.

The main indication for operative management is an inability to maintain a concentric elbow joint following closed reduction. Elbows that are so unstable that prolonged immobilization will be

Fig. 21. Case 5: An 82-year-old woman.

Fig. 22. Case 6: A 56-year-old right-handed woman sustained a ground level fall. Radiographs revealed left elbow dislocation with displaced radial head fracture, coronoid fracture, and olecranon fracture (see Figs. 19 and 20). She underwent ORIF of left coronoid, left olecranon, left radial head, and lateral ulnar collateral ligament repair (see Fig. 21). At 5-month follow-up, she achieved ROM of 10° to 138°, 70° supination, and 90° pronation with no pain.
required should also be considered for early surgical management to avoid stiffness. Because of soft tissue quality, simple elbow dislocation in the elderly may be more unstable, and careful follow-up is mandatory to recognize and promptly treat persistent instability with either closed reduction and external fixation or ligament repair (case 5, Figs. 17–21).

**Terrible triad injury**

Surgical treatment is preferred for most terrible triad injuries, as there are little contemporary data regarding the nonoperative treatment outcomes. A retrospective cohort study conducted by Chan and colleagues reported nonoperative treatment of terrible triad injuries could be an option that can provide good function and restore stable elbow ROM for selected patients: (1) a concentric joint reduction, (2) a radial head fracture that did not cause a mechanical block to the rotation, (3) a smaller coronoid fracture, and (4) a stable arc of motion to a minimum of 30° of extension. When doubt exists, early mobilization abiding by lateral ulnar collateral ligament precautions and repeat radiographs 1 week later can provide reassurance.

**OPEN REDUCTION INTERNAL FIXATION**

A systematic approach, including fixation or replacement of the radial head, fixation of the coronoid fragment, and repair of the LCL, is usually required (case 6, Figs. 22–24). The elbow is then evaluated intraoperatively for residual instability to determine if MCL repair is required. In many cases, the coronoid can be accessed and repaired from a lateral surgical exposure, particularly if a radial head replacement is

---

**Fig. 23.** Case 6: A 56-year-old woman.

**Fig. 24.** Case 6: A 56-year-old woman.
required. Coronoid fractures too small or comminuted to be amenable to screw fixation can be repaired using sutures passed around the coronoid process and anterior capsule through transosseous tunnels on the dorsal ulna.

Some studies of triple triad injury reported satisfactory outcomes with few complications, whereas other investigators have reported a high rate of symptomatic and asymptomatic complications. Complications include stiffness (0%–22%), arthritis (0%–19.5%), ulnar nerve entrapment (0%–18%), and recurrent instability (4%–38%). Gianicola and colleagues reported that obesity, low compliance, delayed treatment, and extensive soft elbow tissue damage caused by a high-energy trauma represented negative prognostic factors that affect the surgical outcomes.

SPECIAL CONSIDERATION FOR GERIATIC PATIENTS

Elderly patients should be evaluated and treated for the fall risk. Special attention should be directed toward identifying comorbidities and reversible illnesses that may impact the treatment recommendations and perioperative risk. In addition, a patient’s preinjury functional abilities, demands, limitations related to the upper extremities, and hand dominance may affect the treatment decision making.

CLINICS CARE POINTS

- Approximately 4.1% of all fractures in the elderly involve the elbow.
- Elderly patients are at risk for elbow injuries following even low-energy falls.
- Approximately one-third of elbow injuries involves the distal humerus. Most of the distal humerus fractures in geriatric patients occur from low-energy injuries, such as falling from standing height.
- Fractures around the elbow in elderly patients are challenging because of poor bone quality, comminution, articular fragmentation, and preexisting conditions of the elbow.

DISCLOSURE

All the authors have declared no conflict of interest for this article.

REFERENCES


43. Ali A, Shahane S, Stanley D. Total elbow arthroplasty for distal humeral fractures: indications,


