Radial Head Fractures

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Treatment of radial head fractures centers around the distinction of stable, nondisplaced or minimally displaced fractures, and those with significant displacement, which are usually part of a greater pattern of injury. Treatment of stable injuries is aimed at achieving osseous union while preventing stiffness and can usually be accomplished with nonoperative means. Operative treatment of isolated radial head fractures is indicated if significant displacement or mechanical block to motion is observed. Options for surgical treatment include open or arthroscopic techniques as well as a myriad of other options including fragment or whole-head excision, internal fixation with headless compression screws, or plate-and-screw constructs as well as prosthetic replacement. Treatment of displaced or unstable fractures centers on restoration of the radiocapitellar contact and repairing other soft tissue injuries, which are necessary to stabilize the elbow. Radial head arthroplasty should be considered in situations where 3 or more fragments of the radial head exist, with the use of various intraoperative methods to ensure restoration of the lateral elbow anatomy.

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Introduction, Classification, and Epidemiology

Despite recent advances in our understanding of patterns of injury, as well as improved fixation and prosthetic devices, radial head fractures still pose a difficult undertaking for the orthopaedic surgeon. In addition, controversies exist regarding the optimal treatment of such fractures.

The classification of radial head fractures was originally defined by Mason in his 1954 article where he distinguished nondisplaced fractures (type I) from displaced partial head fractures (type II) and displaced fractures involving the entire radial head (type III).1 This classification system has been subsequently modified by Broberg and Morrey to better delineate the parameters that differentiate one particular “type” from another, then by Johnston where a type IV fracture was added to the system to account for fractures that are part of an elbow dislocation, and then by Hotchkiss to try to use the classification system to direct treatment of these fractures.2-4

Fractures of the radial head account for approximately 4% of all fractures.1 The incidence of radial head fractures has been reported to be 2.5-2.9 of 10,000 inhabitants and accounts for approximately 1:3 of all elbow fractures.5,6 A recent study on the incidence of radial head fractures over a 10-year period found that 82% of radial head fractures are Mason type I injuries, whereas Mason types II, III, and IV comprise 14%, 3%, and 1%, respectively.7 In addition, a trend was seen in this investigation where male patients comprised 71.4% of Mason type III injuries, whereas 72.7% of type IV fractures occurred in females.7

The propensity for radial head fractures to occur in women older than 50 years has led other authors to investigate the potential for radial head fractures to occur due to osteoporosis. Gebauer et al8 investigated the microarchitecture of cadaveric radial heads in the elderly and found changes consistent with the diagnosis of osteoporosis. Because these fractures tend to occur earlier than other osteoporotic fractures such as the hip and vertebrae, Kaas et al9 suggested that offering elderly patients with radial head fractures a bone mineral density measurement may allow for initiation of treatment and prevention of future osteoporotic fractures.10
Anatomy or Biomechanics and Radiography

The radial head articulates with the distal humerus at the capitellum laterally and with the radial fossa at high flexion angles. It can be palpated just below the antecubital crease with the elbow flexed. It forms an inverted equidistant triangle with the olecranon and lateral epicondyle, which serves as a key landmark for gaining access to elbow joint in arthroscopy and arthrocentesis. Multiple studies have demonstrated that the radial head is not perfectly circular in nature and it is concave to its articulation with the capitellum, forming a slight depression in its midportion.11-14 With the arm in neutral rotation, the long axis of the radial head is perpendicular to the lesser sigmoid notch of the ulna and is bound to it by the annular ligament.11 The radial head is an intraarticular structure, with the capsular insertion of the joint attaching to the annular ligament. The radial head and neck are collinear with each other; however, they form a 15° angle with the radial shaft, away from the bicipital tuberosity.15

Ligamentous anatomy as it pertains to the lateral side of the elbow is variable in nature. Classically, Morrey defined 4 discrete ligaments including the lateral ulnar collateral, radial collateral, accessory lateral collateral, and annular ligaments.10 However, in recent years, it has become clear that these distinct bundles are inconsistent and that significant individual variation exists.17-23 Because of this, some authors have referred to this constellation of ligaments as the lateral collateral ligament (LCL) complex rather than naming individual bands. At present, the LCL complex is believed to be of Y-shaped configuration with origin at the isometric point on the lateral epicondyle with fanning of the capsuloligamentous attachments distally onto the radius and ulna and functions to resist varus and posterolateral stresses on the elbow.24

The neurovascular anatomy of the elbow is complex. Regarding the vasculature, the lateral aspect of the elbow is relatively safe, consisting only of the anastomosis of the radial collateral artery (profunda artery) and the radial recurrent artery (radial artery) at the level of the lateral epicondyle.25 The radial nerve proper and posterior interosseous nerve, and deep, PIN. The PIN then dives deep to the pronator muscle that overlies the proximal radius, opposite to the sensory nerve, and deep, PIN. As it passes over the anterior elbow, the radial nerve lies directly over the radial head, with only capsule interposed. Fortunately, pronation of the forearm displaces the radial nerve further medially, making surgical exposures of the lateral elbow structures safer.26

The radial head functions biomechanically as a secondary stabilizer to valgus stress about the elbow and in the longitudinal stability of the forearm. In his classic study, Morrey et al27 demonstrated the importance of the radial head in cadaveric elbows with medial collateral ligament deficiency. Regarding axial stability of the forearm, multiple structures contribute, including the radial head, interosseous membrane, distal radioulnar joint ligaments, and the triangular fibrocartilage complex. Markolf et al28 showed that comminuted radial head fractures and disruption of the interosseous membrane in a cadaveric model, treated with an appropriately sized radial head prosthesis was sufficient to restore distal ulnar load sharing and prevention of proximal migration of the radius.

Standard radiographic examination of the elbow consists of anteroposterior and lateral views of the elbow; if a radial head fracture is suspected or diagnosed, further radiographs of the forearm and wrist are obtained. In addition to the fracture, the examiner should pay special attention on the anteroposterior view to the radiocapitellar and ulnohumeral joint lines to assess for symmetry, as well as degenerative changes that may preclude fixation. Moreover, on this view, the common fracture line across the anterolateral aspect of the radial head may be discernible. On the lateral view, the presence and concentricity of the 3 arcs should be present, indicating a true lateral.31 In addition, assessment for coronoid tip fractures is often best performed on this view as well, and care should be taken by the treating provider not to misdiagnose these injuries as just a displaced fragment of the radial head, as these fractures generally represent a masquerading “terrible triad” injury. Additionally, assessment for anterior and posterior fat pad signs in the presence of normal osseous anatomy may indicate an occult fracture. If a radial head fracture is suspected, or needs to be further delineated, a 45° lateral oblique view of the radial head can be obtained; this is classically known as the radial head–capitellum view.32 This view is obtained by angling the beam toward the radial head at a 45° angle to the forearm.33 This allows the normal overlap of the radial head and proximal ulna to be removed, allowing complete evaluation of the osseous anatomy of the radial head and capitellum.32

Some authors have assessed the use of a computed tomography scan or magnetic resonance imaging when evaluating fractures about the elbow owing to its complex osseous anatomy.33,34 Certainly this seems reasonable when evaluating complex injury patterns; however, for simple non-displaced or minimally displaced fracture patterns without mechanical blocks to motion, where further elucidation of the fracture pattern is not going to influence treatment, we routinely negate the added costs of a computed tomography scan. In addition, the additional information provided by magnetic resonance imaging has not been shown to change treatment.35

Mechanisms or Patterns of Injury

Probably the most crucial aspect in the diagnostic evaluation of radial head fractures is for the evaluator to be aware of certain patterns of injury that masquerade as simple fractures but are really just the tip of a more complex pattern of injury. Specifically, posterior transolecranon fracture dislocations of the elbow or the classic “terrible triad” injuries (consisting of fracture of the radial head and coronoid as well as disruption
of the LCL complex) are patterns of elbow instability that may at first glance appear as an isolated fracture of the radial head. In their series, Doornberg and Ring reviewed 18 posterior transolecranon fracture dislocations, and the radial head was fractured in all cases, with most being classified as Mason type III injuries; additionally, this fracture type commonly had the LCL avulsed from its humeral origin as well. In their review of 32 terriblle injury cases, Doornberg and Ring found that all of the radial head fractures were either Mason type II or III. If spontaneously reduced, these injuries may present as a statically concentrically reduced ulnohumeral joint and the examiner may interpret the small coronoid fracture as a piece of the comminuted radial head, thereby missing the significant instability pattern and leading to suboptimal treatment.

Classically, Essex-Lopresti fractures have been described as a fracture at the wrist with subsequent longitudinal instability of the forearm, because of injury to the interosseous membrane. In recent years, however, there have been reports of fractures of the radial head that were treated as isolated injuries and subsequently went on to develop severe radiocapitellar wear because of longitudinal instability. Unfortunately, when an injury such as this is not recognized until late, there are few options remaining with a predictable outcome. In this setting, simple excision of the radial head would not suffice, and a reconstruction of the interosseous membrane distally must be performed to address the instability. In all cases where radial head excision is planned, preoperative radiographs of the wrist should be obtained and examined for positive ulnar variance and an intraoperative radial ulnar instability test should be performed.

Because of the constraining capsuloligamentous structures that surround the radial head, the great majority of fractures occurring from low-energy, simple mechanisms, are non-displaced. As a rule, a displaced fracture of the radial head should be a clue for the examiner to investigate further for a high-energy mechanism of injury, and a more complex pattern of instability should be ruled out before treatment of an isolated radial head fracture undertaken.

Nonoperative Treatment

Given that most fractures of the radial head are impaction fractures resulting from axial loads and are not part of a larger, more complex injury pattern, most can be treated nonoperatively with radiographic and clinical union expected, and good long-term results can be achieved. Displaced fractures are rare due to the highly constraining soft tissues present about the radial head; however, it is generally accepted that displacement of \(<2\) mm is within the tolerance for nonsurgical treatment of radial head fractures. However, even when nondisplaced, passive range of motion (ROM) should be performed in supination and pronation to ensure there is no mechanical block. Limited passive ROM is rare in minimally displaced fractures as the fracture fragment is generally part of the anterolateral, nonarticular radial head where the subchondral bone is absent and the radial head is weakest. Mechanical blocks to motion constitute an operative indication. If assessment is difficult secondary to pain, arthrocentesis of the hemarthrosis may be performed to aid in pain relief and local anesthetic may be infused into the joint if desired, although randomized controlled trials fail to show any functional benefit at any time point over simple aspiration.

The main sequela of nonsurgical treatment of radial head fractures is stiffness. In our practice, patients are generally immobilized in either a sugar tong splint or a standard sling, depending on their presentation, pain, and soft tissue swelling. Patients in the sling are encouraged to start performing gentle ROM of the elbow in all arcs of motion after 1 or 2 days, with patients in a splint are encouraged to do so after the splint is discontinued at 1 week. The early ROM of nondisplaced radial head fractures is supported by clinical trials where patients with early ROM were compared with short-term immobilization and had superior comfort, flexion, supination strength, and elbow function at 7 days after the injury. However, these measures were not significant at 4 weeks after the injury.

Nonsurgical treatment of nondisplaced or minimally displaced fractures of the radial head has endured a long history of excellent results, and this is backed up by the literature. Akesson et al recently examined a group of 49 patients with displaced (\(>2\) mm) partial articular fractures of the radial head at an average of 19 years after the injury. In this group, 12% had undergone radial head resection within 6 months of the injury and 82% of patients did well with only slight differences in ROM noted compared with their contralateral side. In the 34 patients who returned for radiographs, there were radiographically significant changes of the fractured elbow compared with the contralateral side; however, this did not seem to be clinically important. This data should be taken into account when making the decision to treat simple, displaced fractures of the radial head surgically, as the outcomes may be difficult to replicate with surgical intervention.

Operative Treatment

Indications for operative treatment of radial head fractures are in evolution and expanding as techniques, instrumentation, and our understanding of injury patterns grows. Presently, our indications for operative fixation include displaced fragments, mechanical blocks to rotation, comminuted fractures, and fractures that are part of a more complex injury or instability pattern. Classically, the definition for displaced fracture fragments has been \(>2\) mm; however, a recent article by Furey et al challenged this paradigm by reviewing conservatively treated fractures of the radial head with \(<2\) mm of displacement and those \(>2\) mm displacement at a mean follow-up of 4.4 years. In this series, there was no statistically significant difference in Disabilities of the Arm, Shoulder, and Hand or Patient-Rated Elbow Evaluation scores, flexion-extension and pronation-supination arcs, or progression of arthritis (according to the Broberg and Morrey grading system).

Before any procedure on the radial head is done, a fluoroscopic examination of the elbow under anesthesia is performed to help diagnose subtle soft tissue injuries and complex patterns of injury that masquerade as simple fractures.
Although traditionally surgery for radial head fractures has been approached surgically through the interval of Kocher between the intermuscular plane of the anconeus (radial nerve) and the extensor carpi ulnaris (PIN), our preferred operative approach for addressing radial head fractures incorporates the isolation of the common extensor origin, the intermuscular plane of the capitellum. Practically speaking, at the far proximal extent of the common extensor origin, the intermuscular plane is difficult to discern, so we perform the Kaplan approach by palpating the radial head through the common extensor fascia and split the common extensor origin in line with its muscular fibers at the midaxis of the radial head with the elbow flexed 90°. Again, because the LCL complex lies inferior to the midaxis of the radial head with the elbow at 90°, this approach allows for preservation of this important structure and affords maximal exposure of the radial head. If distal exposure is needed, the proximal 3 cm of the supinator can be incised and the radial recurrent artery cauterized, with the forearm in pronation without risk to the PIN. Whether or not the Kocher or Kaplan approach is used, it is important for the surgeon to keep the forearm pronated to keep the PIN as far away from the operative field as possible.

Before the development of headless compression screws, anatomically designed plate-and-screw constructs, and radial head replacement systems, comminuted fractures involving the radial head were treated with techniques such as fragment excision and resection arthroplasty. In recent years, however, biomechanical studies have brought to the forefront the role the radial head plays in varus, valgus, axial, and posterolateral rotatory stability of the elbow, and therefore, a shift toward maintaining the radiocapitellar articulation has followed. In patients with mechanical blocks to rotation, where significant displacement is not appreciated on radiographs, a chondral fragment may be present. If small, or without significant subchondral bony attachment that could preclude fixation, fragment excision is an option, with excision of unstable cartilaginous flaps and contouring of the remaining cartilage to a stable rim. Our preference is to perform this arthroscopically as we feel this allows for fragment removal with maximal visualization of the remaining articular surfaces and allows for the defect to be treated with marrow stimulation techniques if indicated. However, in larger fragments that compose approximately 25% of the articular surface of the radial head, every effort should be made to preserve the fragments, even if it necessitates the use of fixation devices with a small footprint such as Kirschner wires or absorbable suture, as authors have shown deleterious effects of excision of large fragments.

Total excision of the radial head, like any resection arthroplasty, has inherent problems with instability of the resected articulation after this is performed. In addition, biomechanical studies have demonstrated concerning alterations in the humeral epicondylar articulation after radial head excision. Previous authors have cautioned against performing a resection arthroplasty in young, high-demand patients owing to postoperative symptoms of instability and pain with activities. Jensen et al have shown that excision of the radial head causes loss of the tensioning effect the head has on the LCL, which can render the ligament functionally incompetent. And retrospective reviews by Lindenhovius et al and Zarattini et al have demonstrated poorer outcomes and higher rates of osteoarthritis with radial head excision compared with fixation. Even still, it is difficult to ignore the long history of success that radial head resection has endured. At long-term follow-up, Coleman et al demonstrated only mild losses in pronation or supination and strength, with only slight (mean 2 mm) increases in ulnar variance and cubitus varus (mean 9°). Furthermore, Broberg et al have demonstrated that conservative or surgical treatments of radial head fractures that result in unsatisfactory outcomes may be treated with delayed resection with significant relief of pain and recovery of motion. However, for patients with a history of traumatic injury to the radial head (acute or remote) who are being considered for radial head resection, we recommend a thorough examination of the wrist in the acute setting and review of all postinjury radiographs in the chronic setting to ensure no accompanying injury to the longitudinal stabilizers of the forearm exists. In addition, intraoperative assessment of the competency of the interosseous membrane should be performed with the radius pulled just as described by Smith et al, if questions as to the competency of the interosseous ligament remain.

In moving away from resection arthroplasty, one of the key decision making points in the surgical treatment of radial head fractures is whether to perform internal fixation of the fragments or radial head arthroplasty. Ring et al were the first to give surgeon’s direction in this dilemma in their classic paper where they examined the outcome of operatively treated radial head fractures and found that in cases where 3 or more fracture fragments exist, superior outcomes were achieved with radial head replacement over internal fixation. When attempting to stabilize osteoarticular fragments surgically, a variety of implantable devices is at the surgeon’s disposal. Before fixation, it is of paramount importance for the surgeon to identify the nonarticulating portion of the radial head; this is located on the anterolateral portion of the radial head that is not covered by cartilage and is void of subchondral bone. This area corresponds to about a 110° safe zone for hardware placement and can be identified by various means including pronating and supinating the forearm to visualize the area that does not articulate with the proximal radioulnar joint (PRUJ), placing the forearm in neutral rotation and identifying the lateral 90° arc, and with the forearm in supination, placement of the hardware as posterior as possible. As a rule, it lies between the radial styloid and List’s tubercle of the radius, which may be more useful in comminuted injuries.

Once internal fixation has been chosen as the means of stabilization, the decision as to whether to use a plate-and-screw construct or countersunk headless screws is made based on the pattern of the fracture. Although plate-and-screw constructs afford greater biomechanical stability, they have been shown to be more likely to violate the pericervical blood supply, more likely to cause postoperative stiffness and have high rates of hardware removal. If a headless cannulated
screw system is chosen as the mode of fixation, the provisional k-wire should be driven through the contralateral cortex to prevent the screw from glancing off the firm cortical bone of the radial neck when the screw is placed obliquely. In addition, the screw should be countersunk under direct visualization to ensure that it is seated below the articular surface (Fig. 1).

Surgical fixation of radial head fractures can result in excellent clinical outcomes. Lindenhovius et al. reported on the surgical treatment of Mason type II fractures at a mean of 22 years. In this series, the mean flexion-extension arc was 129°, the mean Disabilities of the Arm, Shoulder, and Hand scores were 12, and 81% had a Mayo Elbow Performance Index score of good or excellent; however, the reported complication rate was 31%. The author’s conclusion was that surgical treatment resulted in similar outcomes obtained with nonoperative treatment of similar fractures. Still, other have reported superior surgeon- and patient-reported outcome scores for

Figure 1  (A) AP and lateral (B) radiographs of a displaced radial head fracture. Computed tomography scan in the coronal (C) and sagittal (D) planes shows further displacement, measuring >2 mm. Postoperative AP (E) and lateral (F) radiographs of fracture fixation using headless compression screws. AP, anteroposterior.
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the operative treatment of Mason type II fractures compared with conservatively treated fractures.67

Although arthroscopic assessment of isolated radial head fractures seems straightforward, authors have cautioned against doing so in certain cases, especially when the fracture fragments are displaced anteriorly.68 In these cases, the fragments can penetrate the capsule and brachialis anteriorly, making the procedure unsafe owing to the capsular violation and proximity to the PIN.69 Still, there have been many case series and described techniques for arthroscopic management of these fractures.69,70 The indications for such treatment are evolving but seem to be most commonly for fractures with a mechanical block to motion, as well as for fractures that are minimally displaced and that are not part of a more complex pattern of injury. Furthermore, Michels et al69 have proposed that the arthroscopic technique would allow for decreased capsular dissection compared with open techniques, which would allow for increased fragment stability and decreased need for internal fixation.

Arthroscopic assessment of radial head fractures begins with placement of the arthroscope into the proximal anteromedial portal or posterolateral portal for visualization; if arthroscopic internal fixation is planned, authors have advocated the posterolateral portal be used, because along with the use of a 70° scope, it allows the best visualization of the fracture.68 Concurrently, a soft spot portal can be placed to allow for evacuation of the fracture hematoma and insertion of arthroscopic probes and instruments. Through the arthroscope, assessment of fracture incongruity, impingement, and stability can be assessed. Reduction of fragments is often performed by a combination of forearm manipulation with use of arthroscopic probes and occasionally a reduction tenaculum.68 Once obtained, the soft spot portal can be used for internal fixation, often with the use of cannulated headless compression screws or bioabsorbable screws available from numerous manufacturers. Following placement of internal fixation, stability and reduction can once again be accessed through the arthroscope to ensure there are no mechanical blocks to ROM.

Numerous authors have published their experience with arthroscopic reduction of radial head fractures.69,70 Rolla et al71 reported 6 cases with minimum of 12-month follow-up; half of the cases were classified as Mason type II fractures, whereas 2 were type III and one was type IV. All patients in this series returned to their preinjury level of function within 6 months and at 12 months, the Mayo Elbow Performance scores were excellent for 3 and good for 3 patients.70 Michels et al69 have also reported the results of arthroscopic treatment of type II fractures in 14 patients with a mean follow-up of 66 months. The Mayo Elbow Performance scores were excellent in 11 and good in 3 patients; interestingly, in their experience, a single screw was usually sufficient for obtaining stability, which attributed to the fact that the native capsuloligamentous structures were left intact with an arthroscopic approach.69

When osteosynthesis cannot be achieved owing to extensive comminution, significant impaction compromising the articular cartilage, or when > 3 fragments are present, radial head arthroplasty offers the most predictable treatment.56 Prosthetic replacement of the radial head is preferred in cases of concomitant radial head fracture and longitudinal instability of the forearm.71 Many design options exist including bipolar and monoblock prostheses, smooth and polished stems, and cemented and uncemented designs. Each design has its own benefits and drawbacks, which are beyond the scope of this article. The technical difficulty with radial head prostheses lies in the appropriate sizing of the implant. When performing arthroplasty of the radial head, all fragments should be preserved and assembled on the back table so that an accurate diameter of the head can be determined; exploration of the radial, capitellar, and olecranon fossae may be necessary to locate all fragments, especially in high-energy trauma. Prosthetic size is based on the minor diameter of the excised radial head, which is typically about 2 mm less than the maximal diameter.65 This helps prevent contact of the prosthetic radial head on the lateral trochlea (Fig. 2).

An even more significant problem with radial head replacement centers on the estimation of the correct length of the prosthesis and prevention of overstuffing the joint.72 Radial head fractures necessitating replacement are usually associated with complex instability patterns, with collateral ligament injury, making restoration of the normal length difficult. Previous authors have advocated the use of fluoroscopy intraoperatively to assess length; however, the lateral ulnohumeral joint space has been shown to be wider laterally in normal individuals, making it a precarious estimation of overstuffing.73,74 If using the medial ulnohumeral joint space, which is normally parallel, authors have shown that overlengthening of the radius by 6 mm can occur before radiographic alterations in the medial ulnohumeral joint space become appreciable radiographically.75 In addition, intraoperative assessment of the prosthesis-capitellar gap in the setting of LCL injury is an unreliable guide to implant thickness and should not be used.65

To replicate the normal anatomy of the radial head, certain authors have suggested using the PRUJ as the more accurate means for restoration of radial length. Normally, the proximal extent of the PRUJ lies 2 mm distal to the tip of the coronoid, and optimally, the proximal extent of the metallic radial head should be flush with the proximal extent of the PRUJ (Fig. 2).70 This can be difficult to assess with the trial prosthesis in place and we recommend slightly undersizing of the prosthesis if any question exists regarding length. In addition to preventing overstuffing, slightly undersizing the length allows us to intraoperatively use a freer-elevator slide across the trial component to see if it contacts the proximal extent of the lesser sigmoid notch of the ulna (indicating slight undersizing of the component). Recently, Athwal et al77 published on use of the contralateral elbow radiographs to determine adequate prosthetic length, and their results suggested the ability to detect radial lengthening of 1 mm was 98% (sensitivity). However, the measurements and angles needed to perform this technique intraoperatively with fluoroscopy calls into questions its applicability in the operating room.

Inherent problems with hemiarthroplasty of the radio-capitellar joint exist and are similar to other joints where a metal on cartilage articulation exists and overtime may lead to chondral erosion and pain (Fig. 3).78 Innovations to combat
these degenerative changes have been developed and include using prosthetic radial head implants composed of metals with a modulus of elasticity closer to that of native cartilage such as pyrocarbon and even lateral replacement elbow arthroplasty systems. Only early clinical results of pyrocarbon radial heads are available.

**Rehabilitation**

The goal with both operative and nonoperative treatment of radial head fractures is early motion while protecting the integrity of the fracture, ligament repair, or fixation. When in doubt, motion can be delayed giving priority to stability over motion.
It is preferable to treat a stiff well-reduced joint vs one that is chronically subluxated or dislocated. If the LCL complex has been repaired, it is important to protect it from varus stress. In these cases, we often use an articulated brace with a small pillow to minimize the varus stress for 4-6 weeks and still allowing flexion-extension and pronation-supination movement. By 4-6 weeks, the protection can be eliminated allowing full passive ROM, active assistive ROM, and active AROM. Stressful activities and strengthening are delayed for at least 3 months after fracture.

**Current Trends and Author’s Preferred Treatment**

In simple fracture patterns with no instability and good passive motion, we use nonoperative management with early ROM. In simple displaced fractures of the radial head, we prefer to use cannulated headless compression screws to achieve fracture stability. When radial head replacement is indicated, we prefer an uncemented, monopolar design and use the proximal radial
ulnar joint to judge length of the radial head. The trial prosthesis is taken through a ROM to ensure that it does not asymmetrically articulate with the capitellum, and intraoperative fluoroscopy is used to ensure the prosthesis does not articulate with the lateral trochlea. We typically reserve radial head excision for cases of failed fixation or replacement (Fig. 3).

**Conclusion**

To manage radial head fractures adequately, the treating physician must understand the mechanisms and radiographic signs that comprise a greater pattern of injury so that these patients can be managed with appropriate surgical strategies. Fortunately, most radial head fractures are simple in nature and nonoperative measures constitute the mainstay of treatment. Unfortunately, for fractures that meet the indications for surgical intervention, there are a myriad of fixation devices and implants at the surgeon’s disposal with little evidence to suggest that one treatment, technique, or implant is superior to another.

**References**

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