Primary Osteoarthritis and Posttraumatic Arthritis of the Elbow

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KEYWORDS

• Primary osteoarthritis • Posttraumatic arthritis
• Elbow • Treatment

Arthritis of the elbow resulting from either prior trauma or primary osteoarthritis is similar in that the end result is often a combination of pain and stiffness, but the location of the disorder can be different. Treatment decisions must be made on a case-by-case basis taking into account patient age, level of demand, and location and degree of degenerative changes. This article focuses primarily on the unique pathogenesis and general treatment rationale for primary osteoarthritis and posttraumatic arthritis of the elbow.

BACKGROUND/PATHOGENESIS

Primary Osteoarthritis

Primary osteoarthritis of the elbow is uncommon and usually presents on the dominant side in middle-aged men who give a history of heavy use through sport or labor. Elbow osteoarthritis has a unique disease progression that provides a role for clinical success with debridement in its early stages, where such a procedure would traditionally be less successful in other joints such as the knee or hip.

The bony architecture of the ulnohumeral joint creates a high degree of articular congruity that leads to preservation of most the articular cartilage until the advanced stages of osteoarthritis. As a result, early disease typically presents with pain primarily at terminal extension and flexion associated with engaging osteophytes at the tips of the coronoid and olecranon, as well as their respective fossae (**Fig. 1**).[1–3] It is not until late-stage disease that there is pain throughout the arc of motion coinciding with diffuse articular degeneration. The impingement created by the engaging osteophytes not only causes pain, but, as they enlarge, the osteophytes become space-occupying lesions and lead to progressive stiffness resulting in secondary capsular contracture in time.

Primary osteoarthritis of the radiocapitellar joint alone is uncommon (**Fig. 2**). Patients presenting as such frequently have concomitant degenerative changes of the ulnohumeral joint. Therefore, before undertaking treatment of presumed isolated disease at the radiocapitellar joint, one must be certain that the patient's pain and tenderness is indeed located laterally, and that forearm rotation is typically more bothersome than elbow flexion and extension.

Rettig and colleagues[4] specifically studied morphologic characteristics in the osteoarthritic elbow compared with normal controls. No marked differences were seen. They found statistically significant increases in the ulnohumeral joint lateral facet angle on the anteroposterior radiograph as well as the deviation of the radiocapitellar line anteriorly from the center of the capitellum on the lateral radiograph. The investigators questioned the clinical significance of these findings, because the former was a difference of less than 5 degrees and the latter could be a manifestation of advanced elbow arthritis leading to anterior subluxation of the radius.

Posttraumatic Arthritis

Arthritis following elbow trauma can take several forms, usually dependant on the nature of the

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Fig. 1. Lateral radiograph of elbow osteoarthritis demonstrating impinging osteophytes in the anterior and posterior ulnohumeral joints as well as on the anterior radial head.

original trauma. One of the more common sources is radiocapitellar arthritis after malunion of a displaced intra-articular radial head fracture (see **Fig. 2**). In such cases, similar to cases of symptomatic radiocapitellar osteoarthritis, patients usually present with laterally based elbow pain that localizes well to the radiocapitellar joint and pain with forearm rotation more than elbow flexion and extension. Arthritis secondary to malunion of intra-articular distal humerus fracture or proximal ulna fracture can be found as well.

In addition to identifying the arthritic area of the elbow in such patients, it is equally important to assess whether there was any elbow instability at the time of injury in the form of a fracture dislocation, and whether there are signs or symptoms of ongoing instability. The presence of ongoing instability limits the operative options for management in favor of arthroplasty or arthrodesis.

EVALUATION

History

When taking a history from a patient with posttraumatic or primary arthritis of the elbow, there are several important factors to address. It is critical to identify the current complaint. If the primary complaint is pain, one should attempt to localize it (ie, radiocapitellar joint, ulnohumeral joint) and confirm whether the patient has pain only at the extremes of flexion and extension or whether there is pain throughout the arc of motion. If stiffness is the primary complaint, it is important to assess whether the patient primarily lacks flexion, extension, or both, and whether there is any significant dysfunction secondary to the condition or whether it is simply an asymmetry the patient has noticed. Patient selection is also critical in elbow stiffness operations, given the extensive rehabilitation required and potential for limited clinical success in the noncompliant or uninformed patient.

The expectations and demand level of the patient must also be considered, because this greatly influences the treatment options, especially for advanced disease when considering arthroplasty alternatives. Special consideration must be given in the case of the previously operated elbow with posttraumatic arthritis. Any history or concerns for

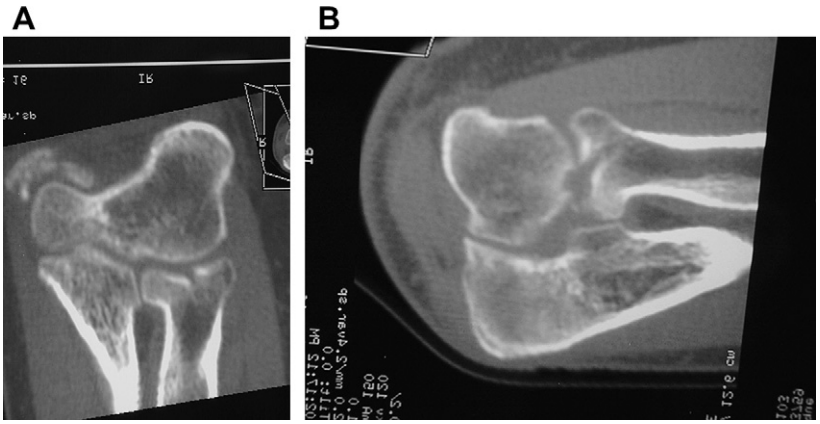

Fig. 2. (*A*) Anteroposterior and (*B*) lateral radiographs of radiocapitellar post-traumatic arthritis after radial head fracture.