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Osteochondritis Dissecans Lesion of the Radial Head

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Take-Home Points

- Radial Head OCD lesions are uncommon.
- Typically present in athletes that engage in repetitive trauma to elbow (throwers, gymnasts).
- MRI is the best modality for making diagnosis.
- Attempt nonsurgical treatment initially, especially in skeletally immature patients.
- If nonsurgical fails or there is an unstable lesion, consider operative intervention.

Case Report

A healthy, 14-year-old, left-hand-dominant adolescent boy presented to the office with a chief complaint of pain localized to the posterolateral aspect of his elbow. He described an injury where he felt a “pop” in his elbow followed by immediate pain in the posterolateral elbow after throwing a pitch during a baseball game. Since the injury, the patient had experienced difficulty extending his elbow and a sharp, throbbing pain during forearm rotation. The patient also reported an intermittent clicking feeling in the elbow. Prior to this injury, he had no elbow pain. He presented in an otherwise normal state of health with no reported past medical or surgical history and no previous trauma to the left upper extremity.

Physical examination demonstrated a mild effusion of the left elbow in the region of the posterolateral corner or “soft spot” with tenderness to palpation over the radial head. The patient had restricted elbow motion with 30° to 135° of flexion. He had 90° of pronation and supination. Ligamentous examination revealed stability of the elbow

to both varus and valgus stress at 30° of flexion. No deficits were observed upon upper-extremity neurovascular examination.

Plain radiographs of the left elbow were initially taken. Anteroposterior, lateral, and Greenspan views revealed evidence of a displaced osteochondral fragment of the radial head in this skeletally immature patient. No involvement of the capitellum was apparent (**Figures 1A-1C**). Non-contrast magnetic resonance imaging (MRI) of the left elbow was subsequently obtained to evaluate the lesion further, and the images confirmed an unstable osteochondritis dissecans (OCD) lesion of the radial head with a detached fragment entrapped within the elbow joint (**Figures 2A-2E**).

Elbow arthroscopy was performed to evaluate the extent of the OCD lesion to enable determination of the integrity of the cartilaginous surface and remove the loose body entrapped within the elbow joint. Multiple loose bodies (all <5 mm in size) were removed from the elbow joint. Visualization of the radiocapitellar joint revealed extensive cartilage damage to the radial head with multiple areas of denuded cartilage and exposed bone. The main chondral defect measured approximately 4 mm in size. Probing of the lesion confirmed no stable edge; thus, abrasion arthroplasty was performed to stabilize the lesion and stimulate future fibrous cartilage growth (**Figures 3A, 3B**).

The patient was started on physical therapy consisting of active and active-assisted elbow ranges of motion on postoperative day 10. At the 6-week follow up, the patient presented to the office with pain-free motion of the left elbow ranging from -5° to 135° of flexion. He maintained full pronation and supination. At this point, the patient was advised to begin a throwing program. Three months after treatment, the patient resumed baseball activities, including throwing, with pain-free, full range of motion of the elbow. The patient and the patient's parents provided written informed consent for print and electronic publication of this case report.

Discussion

Elbow pain is a common complaint among young baseball players. OCD lesions, however, are an uncommon entity associated with elbow pathology.¹ The overall incidence of OCD lesions is between 15 to 30 per 100,000 people.²⁻³ Specifically in patients aged 2 to 19 years, the incidence of elbow OCD lesions is 2.2 per 100,000 patients and 3.8 and 0.6 per 100,000 for males and females, respectively.⁴ Radial head OCD lesions are extremely rare, occurring in <5% of all elbow OCD cases.¹ The majority of these lesions are asymptomatic and typically seen in patients who engage in repetitive overhead and upper-extremity weight-bearing activities. Reports indicate that the incidence of these lesions is on the rise and the age of presentation is decreasing, likely because of increased awareness of the disease and increasing involvement of young athletes in competitive athletics.⁴⁻⁵ Most patients with elbow OCD have a history of repetitive overuse of the elbow, as seen in baseball players, leading to excessive compressive and shear forces across the radiocapitellar joint and progression of the dissecans lesion.⁶

Patients with OCD lesions of the elbow typically present with inflammatory type symptoms and lateral elbow pain. The pain tends to be mild at rest and becomes more pronounced with activity. Patients often wait until mechanical symptoms ensue (eg, clicking, catching, or locking) before presenting to the office. On physical examination, pain in the region of the OCD lesion is usually accompanied by a mild effusion. Stiffness, particularly a loss of terminal extension, may accompany the mechanical symptoms on range of motion testing.⁷

Workup of elbow OCD lesions begins with obtaining plain radiographs of the elbow. Plain films are of limited use in evaluating these lesions but can help determine separation and the approximate size of the fragment.⁸ Further work-up must include MRI sequences, which allow for the best evaluation of the articular cartilage, underlying

bone, and, specifically, the size and degree of separation of the OCD lesion.⁹

Nonoperative treatment of OCD lesions is usually successful if diagnosed early. Such treatment consists of activity modification, rest, anti-inflammatory medications, and a gradual return to athletic activities over the next 3 to 6 months provided the symptoms abate.¹⁰⁻¹¹ During this interval, physical therapy may be employed to preserve or regain range of motion in the elbow. Clinical evidence has demonstrated improved outcomes in younger athletes with open physes.¹² Returning to athletic activities is advised only when complete resolution of symptoms has been achieved and full motion about the elbow and shoulder girdle has been regained.⁶

If symptoms persist despite nonoperative management, or if evidence of an unstable lesion (ie, detached fragment) is obtained, operative intervention is appropriate. Operative management includes diagnostic arthroscopy of the entire elbow, removal of any small, loose bodies, and synovectomy as needed. Thereafter, the OCD lesion must be addressed. In cases of capitellar OCD lesions, if the articular cartilage surface is intact, antegrade or retrograde drilling of the subchondral bone is appropriate and will likely result in a good-to-excellent functional outcome.¹³⁻¹⁴ If disruption to the articular cartilage fissures is found or the lesion appears to be separating from the native bone, fixation of the fragment can be attempted, provided an adequate portion of the subchondral bone remains attached to the OCD lesion.^{6,14} Oftentimes, the bony bed must be prepared prior to fixation by removal of any fibrous tissue overlying the subchondral bone and ensuring adequate bleeding across the entire bed. Care should be taken to remove any fibrous tissue underlying the OCD lesion. If the OCD lesion is completely loose and/or the bone stock is insufficient or fragmented, arthroscopic removal of the OCD lesion followed by débridement and abrasion arthroplasty of subchondral bone is recommended.¹⁵ Improved functional outcomes from this procedure can be expected in contained lesions.¹⁵ If the patient continues to be symptomatic, osteochondral autograft or allograft procedures can be attempted depending on the size of the remaining defect.¹⁶⁻¹⁸

Other cases of radial head OCD lesions have been reported in the literature.¹⁹⁻²⁰ In 2009, Dotzis and colleagues¹⁹ reported a case of an OCD lesion that was managed nonsurgically with observation alone as the lesion was stable and non-detached. Tatebe and colleagues²⁰ reported 4 cases in which OCD involved the radial head and was accompanied by radial head subluxation. All lesions were located at the posteromedial aspect of the radial head with anterior subluxation of the radial head.²⁰ Three of the cases were managed surgically via ulnar osteotomy (2 cases) and fragment removal (1 case).²⁰ All except the 1 case treated by fragment excision revealed a good outcome.²⁰ The patient in this case presented with a detached lesion, confirmed on MRI, with pain, mechanical symptoms, and of loss of terminal extension. Given the chronicity of the injury and the presence of mechanical symptoms, the decision was made to proceed with operative intervention. During elbow arthroscopy, multiple loose bodies were removed from the elbow joint, and inspection of the radiocapitellar joint revealed extensive cartilage damage to the radial head with multiple areas of denuded cartilage and exposed bone. Since the OCD lesion was completely loose and the bone stock was insufficient and too fragmented to attempt fixation, abrasion arthroplasty was performed to stabilize the lesion and stimulate future fibrous cartilage growth. At the 6-week follow up, the patient regained full range of motion of this elbow with no complaints of pain. At the 3-month follow up, the patient reported no pain after returning to throwing and all baseball-related activities.

Conclusion

This report presents an extremely rare case of an OCD lesion involving the radial head. Diagnosis and treatment of this lesion followed a protocol similar to that used for the management of capitellar OCD lesions. When dealing with elbow OCD lesions, especially in the skeletally immature patient population, nonsurgical management and a gradual return to activities should be attempted. If symptoms persist despite nonoperative management or

evidence of an unstable lesion (as presented in this case) is obtained, operative intervention is appropriate.

Key Info

Figures/Tables

Figures / Tables:

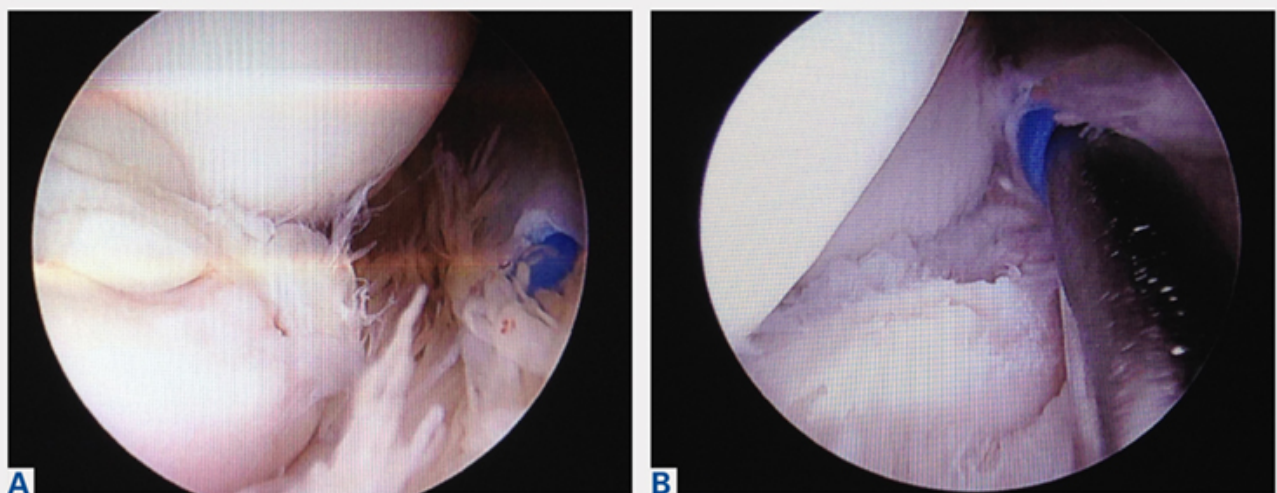
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