

# Osteochondritis Dissecans of the Elbow

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## KEYWORDS

• Osteochondritis dissecans • Elbow • Adolescent sports

## KEY POINTS

- Osteochondritis dissecans (OCD) of the elbow, usually of the capitellum, is the second most common location seen in young, athletic individuals.
- Some sports seem to increase the risk of elbow OCD: overhead sports, such as baseball, and upper extremity weight-bearing sports, such as gymnastics.
- Elbow OCD is often diagnosed after the chondral surface has been significantly compromised and this lessens the chance to preserve them.

## INTRODUCTION

Osteochondritis dissecans (OCD) is a musculoskeletal problem occurring primarily in the maturing skeleton. Many early descriptions of the problem came from surgeons who opened the knee joint looking for the cause of catching and locking symptoms. In these first cases, large, loose OCD fragments were found and removed, making the patients significantly better in the short run, although often not in the long-term.<sup>1</sup> To describe the pathology, König in 1887 coined the phrase “osteochondritis dissecans.” Many authors disagreed with his description and attempts to change the name occurred for years.<sup>2</sup> The difference between the juvenile and adult forms of the disease also led to significant differing opinions about the problem and its best treatment.<sup>3</sup> Improvements in imaging and especially the emergence of magnetic resonance imaging (MRI) sequences in the diagnosis and care of OCD have led to an improved understanding and ability to treat the problem. The most recent definition of human OCD lesions, proposed by the Research in Osteochondritis of the Knee study group, highlights that these are (1) focal; (2) idiopathic; (3) involve subchondral bone; and (4) risk instability and disruption of articular cartilage with potential long-term consequences, such as premature osteoarthritis.<sup>4</sup> There are still many unanswered questions, however, with regards to the cause and the best treatment options for OCD when diagnosed.

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The original description of OCD and the most common location for it is within the maturing knee along the lateral border of the medial femoral condyle with an overall incidence of these lesions in the knee reported to be between 18 (females) and 29 (males) per 100,000.<sup>5</sup> Linden and colleagues<sup>5</sup> noted the incidence to seemingly be increasing and others have noted a simultaneously decreasing age at presentation.<sup>3,6</sup> OCD is also increasingly diagnosed in other joints, such as ankle, hip, elbow, and shoulder. The elbow in particular, where OCD is most commonly seen in the capitellum, is increasing in incidence at the most rapid rate.<sup>7</sup>

The increased incidence and therefore interest in capitellar OCD has paralleled the increased competitive, year-round involvement of young athletes in upper extremity-dominant sports. The use of high-resolution MRI allows earlier diagnosis of the problem and the ability to differentiate OCD from osteonecrosis; osteochondrosis; hereditary epiphyseal dysplasia; little leaguer's elbow; and most importantly, Panner disease, an articular osteochondrosis of the capitellum,<sup>8</sup> with which it is often confused.<sup>9-11</sup> Compared with Panner disease, where patients are often prepubescent with full resolution of the problem and a good clinical outcome, the outcome for capitellar OCD is not always good with the prognosis and outcome dependent on the patient age, location, and severity at the time of diagnosis.<sup>12-14</sup> Sports placing repetitive weight-bearing stress on the elbow, such as gymnastics, or repetitive compression forces seen in overhead athletes, such as baseball players or javelin throwers, lead to articular cartilage changes and stress reaction to the subchondral bone. This starts a cascade of events that can lead to or propagate an OCD lesion. Although many of these lesions can heal, a delay in diagnosis with continued stressing of the lesion interferes with this healing and can lead to long-term consequences and worsening of elbow function.

## ETIOLOGY AND DISEASE PROGRESSION

After the inflammatory cause of OCD was discounted authors shifted their attention to other possibilities.<sup>15,16</sup> Some evidence does exist for there to be a genetic predisposition in OCD within the knee but this cause in the elbow has not been shown.<sup>17</sup> OCD within the elbow seems to be related to repetitive microtrauma, which leads to a perpetuation of an established lesion or perhaps its creation. This is supported by the correlation seen between sports where the upper extremity is weight bearing (gymnastics and wrestling) or where repetitive joint loading (baseball and javelin) occurs. Reviewing the correlation between OCD lesions and these sports<sup>18</sup> seems to confirm repetitive trauma as a major cause of elbow OCD.<sup>9</sup>

After the pathologic process has started most authors acknowledge that the healing potential of OCD, especially when present in the capitellum, is limited because of the tenuous blood supply of the capitellum. This is a relative deviation away from knee OCD where the blood supply of the distal femur is excellent. In the case of the knee the plasticity and health of the young, growing bone allows it to heal with no long-term morbidity when put into the right environment at an early stage of the disease. Conversely, if the elbow is subjected to ongoing stress the tenuous blood supply of the capitellum does not allow the bone to heal and an unfortunate cascade of events occurs making it similar to the process of avascular necrosis seen in femoral and humeral heads.<sup>19</sup> In these situations the subchondral bone softens leading to a loss of a solid foundation for the overlying articular cartilage. The cartilage fissures, exposing the bone to synovial fluid, which leads to further bone injury and further deterioration as the synovial and inflammatory fluid tracks beneath the subchondral bone. This lessens the chance for bony healing to occur and increases the chance that the

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