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Case report
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Avascular necrosis of lunate bone: Kienbock disease

Lunat kemiğin avasküler nekrozu: Kienböck hastalığı

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Abstract
Kienbock disease is a rare disorder involving the lunate, one of the carpal bones, and is therefore not generally included in the differential diagnosis of patients presenting to the emergency department with wrist pain. In this case report, we would like to highlight a case of Kienbock disease in a 28-year-old female patient without any medical or traumatic history. Although it is a very rare disease of the lunate, emergency physicians should consider Kienbock disease in those patients with complaints of pain, swelling and limitation of motion of the wrist. An overlooked diagnosis or misdiagnosis may lead to bony ischemia, necrosis, and ultimately collapse of the bone.
Keywords: Kienbock disease, Avascular necrosis, Wrist pain

Öz
Kienböck hastalığı, el bileğindeki lunat kemiği ilgilendiren nadir bir hastalıktır, bu nedenle acil servise el bileği ağrısı ile başvuran hastaların ayırıcı tanısında yer almamaktadır. Bu olgu sunumunda, hastalık veya travma öyküsü olmayan 28 yaşındaki bir kadın hastada Kienböck hastalığını vurgulamak istiyoruz. Her ne kadar Kienbock hastalığı lunat kemiğin nadir bir hastalığı olmasına rağmen, acil doktorları el bileğinde ağrı, şişlik ve hareket kısıtlılığı olan hastalarda bu hastalığını akılda tutmalıdırlar. Göz ardı edilen teşhis veya yanlış tanı, kemik iskemisine, nekrozuna neden olabilir.
Anahtar kelimeler: Kienböck hastalığı, Avasküler nekroz, Bilek ağrısı

Introduction

Kienbock disease (KD) is a very uncommon condition of the lunate bone that is characterized by sclerosis, cystic changes, fragmentation and progressive osteonecrosis [1,2]. Diagnosis of the disease is usually delayed because of a lack of significant radiographic changes during the early stages of disease [1]. Patients usually have the history of recurrent trauma. Osteonecrosis of the lunate bone is most common between the second and fifth decades of life [3]. In this case, we would like to highlight a case of KD in a 28-year-old female patient without any medical or traumatic history.

Case presentation

A 28-year-old female patient was admitted to our emergency department (ED) with complaint of right wrist pain and difficulty to move her hand lasting 1 week in duration. She described the pain level of her wrist as moderate, rating it 6 of 10 on the pain scale. In her history she had never injured or sustained any minor or major trauma to the right wrist before presenting to the ED. The patient's pain was sharp, aggravated with extension of the wrist and relieved with immobilization. The patient had no past medical and surgical history. She was not taking any medications and had no known allergies. She denied current or past use of tobacco and demonstrated moderate alcohol consumption. She is right-hand dominant.

On examination of the wrist, the right wrist demonstrated no obvious asymmetry or deformity compared with the left wrist. There was no surface trauma, open wounds, bruising or deformity. There was also no overlying erythema or warmth to touch. There was moderate swelling and tenderness on palpation on the dorsum midwrist. There was no scaphoid fullness or tenderness on direct palpation or axial loading. She has limited active and passive range of motion of her right wrist. Other physical and neurological examination including sensation, deep tendon reflexes and motor strength was unremarkable. Radial and ulnar arterial pulses were palpable. Radiograph of the right wrists was obtained. It revealed mild sclerosis, cystic lesions and irregularity on the borders of lunate bone (Figure 1).

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A Magnetic resonance imaging (MRI) study of the right wrist showed hypointense lesion and sclerosis in the lunate bone (Figure 2). These findings were consistent with osteonecrosis of the lunate bone and the final diagnosis was KD. The patient was referred to orthopedic surgeon and started to use forearm split for immobilization of wrist and analgesic therapy. After a 3-week follow-up period, the patient reported that her complaints regressed.

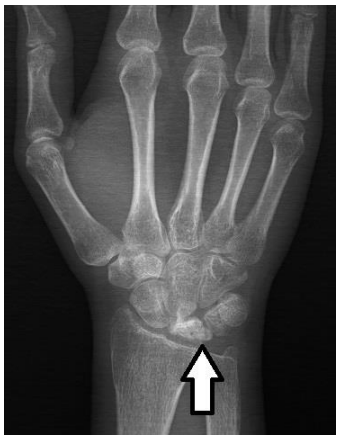

Figure 1: Cystic lesion and irregularity on lunate bone at radiography.

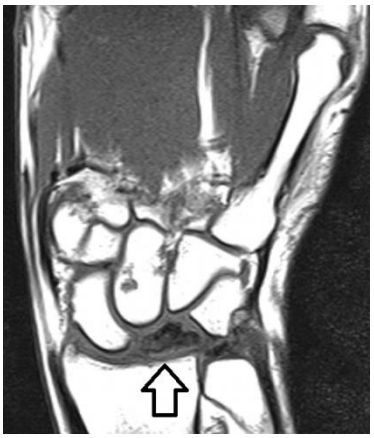

Figure 2: Hypointense lesion in the lunate bone on T1-weighted MRI

Table 1: Stahl-Lichtman classification system

Stages	Explanation
Stage I	Normal radiograph
Stage II	Lunate sclerosis without collapse
Stage III	Lunate fragmentation and collapse
IIIa	Without carpal collapse
IIIb	With carpal collapse
Stage IV	Degenerative changes around lunate

Discussion

Although the etiology is quite controversial in the literature, KD should be regarded in the differential diagnosis of the patients who were admitted to the ED with complaints of pain, swelling, and limitation of motion in the wrist [1,4].

KD is most common between the second and fifth decades of life and it affects men more than women [3]. KD is a very rare disease which is characterized by sclerosis, cystic changes, fragmentation and progressive osteonecrosis. Osteonecrosis is seen due to interrupted blood flow to the bone [1]. The disease commonly affects the dominant wrist, as in our case and generally related with the hyperextension of wrist. However, there are also 3 etiological mechanism of the disease: mechanical, vascular and traumatic. Other reasons are alcohol over intake, obesity, steroid intake, coagulation disorders, decreased blood flow and increased venous pressure [1,5,6].

The patients typically present with pain localized to the radiolunate facet, decreased motion, swelling and weakness in the affected hand. Pain is classically insidious in onset, often related to activity and can be present for extended periods before presentation [3]. In our case, the patient presented to ED with similar complaints.

Radiography is the initial imaging technique for assessing KD and also can be used to rule out other pathological conditions, such as fractures [7]. MRI is effective in the early stage diagnosis of KD [8]. It is generally diagnosed radiologically at late stages. The most commonly used staging system in the classification of KD is Stahl-Lichtman classification system. It is shown in the table 1 [9,10]. This classification is highly reliable and reproducible and has the most clinical relevance because it helps in determining the most appropriate treatment [7]. A lot of treatment methods which extend from conservative treatment to surgical have been described in the treatment of KD. However, none of the treatment methods was accepted as standard [11]. Immobilization and antiinflammatory drug therapy are recommended at the early stage [12]. For the conservative treatment of KD, immobilization with splinting or casting and activity modification can be used [4,13,14]. If this therapy is unsuccessful, joint leveling technique should be considered [15,16].

Although KD is a very rare disease of the lunate, one of the carpal bones, emergency physicians should consider KD in those patients who were admitted to the ED with complaints of pain, swelling and limitation of motion of the wrist. An overlooked diagnosis or misdiagnosis may lead to bony ischemia, necrosis and ultimately collapse of the bone.

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