

## A RARE CAUSE OF PAIN IN THE MUSCULOSKELETAL SYSTEM: BONE MARROW EDEMA SYNDROME

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### ABSTRACT

Bone marrow edema syndrome is characterized by increased interstitial fluid in the bone marrow and is a rare disease in children and adolescents. Therefore, to make this diagnosis, it should be considered in the differential diagnosis of musculoskeletal system pain. With this perspective, the aim was to present a 17-year-old patient who was diagnosed on magnetic resonance imaging with bone marrow edema and to highlight characteristics of this rare condition in the pediatric and adolescent population.

**Keywords:** Pain, Musculoskeletal system, Bone marrow edema.

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### INTRODUCTION

Bone marrow edema syndrome (BMES) is a rare and usually self-limiting exclusion syndrome characterized by increased interstitial fluid in the bone marrow, which may cause severe pain at times. The disease is generally observed in the hip joint in the adult patient group. It rarely involves some other joints. It is often misdiagnosed, as its clinical findings are highly variable and non-specific. To make a correct diagnosis, clinicians should be aware of the syndrome and in patients presenting with musculoskeletal pain, the differential diagnosis should include BMES, especially when patient history and laboratory testing indicates low risk of other common causes. The disease usually resolves within a year without any sequelae [1-3].

### CASE REPORT

A 17-year-old male patient was admitted to the emergency room with severe back pain, which had been intermittent for 2 months but had increased in the past week. There was no history of trauma. It was learned that the patient had undertaken heavy exercise at home, 2 days before admission. It was observed that his pain decreased with rest and massage, but increased after exercise and persisted in the following days. There was no pathological feature in the personal and family history. On physical examination, it was noted that his pain increased with movement around the scapula and could be exacerbated or relieved depending on his lying position. This pain was at a level that interfered with the daily activity of the patient. No pathology was found in the patient's laboratory tests. In particular, acute-phase reactants and sedimentation were normal. In terms of possible muscle-tendon pathologies, bilateral scapula and shoulder magnetic resonance imaging (MRI) were performed. MRI imaging of the left scapula revealed BMES (Fig. 1). After diagnosis, nonsteroidal anti-inflammatory therapy (NSAID) and bed rest were ordered. His complaints disappeared within 3 days and the patient was discharged on NSAID. The patient reattended 1 week later for follow-up, and he remained symptom and problem free. We wanted to present this case to contribute to the literature. The patient consent taken before presenting this case.

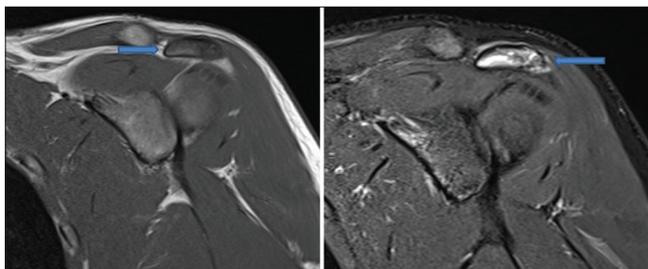
### DISCUSSION

BMES has been increasingly seen in the literature in recent years. In general, patients present with pain that restricts daily activities [1,4].

It is a syndrome that was first identified and defined by MRI in 1988. It is mostly seen in middle-aged patients and in joints such as hip and knee [5,6]. BMES may develop due to mechanical, reactive, or ischemic causes but the pathogenesis is not fully understood. Increased intraosseous pressure and progression of cartilage damage have been shown as the cause of the pain. Histological findings vary according to the underlying etiology. Recovery without any sequelae is thought to be related to the self-renewal capacity of bone. Differential diagnosis of bone marrow syndrome findings due to pathologies such as mechanical, ischemic, malignancy, and osteomyelitis is mostly made by physical examination, history, laboratory findings, and imaging methods. MRI is especially helpful in diagnosis. However, the differential diagnosis should be made meticulously not to miss a serious underlying pathology [7-11]. Some signal changes are evident on MRI and are characterized by low signal intensity in T1-weighted images and high signal intensity in T2-weighted imaging [4,10,12,13]. In our case, the diagnosis was made because of hyperintense areas on T2 imaging. Although this syndrome is rarely seen in children, it was possible to diagnose this patient based on MRI findings. Although it is rare in the shoulder area, it is probable that it was caused by overuse.

BMES can be divided into three stages. The 1<sup>st</sup> month is characterized by severe pain and dysfunction. After 1-2 months, the pain reaches a maximum level. In the following months, the pain gradually decreases and heals without any sequelae. While pain symptoms increase with the load on the affected area, pain decreases with rest. Patients usually try to protect the affected area and avoid actions involving excessive weight [14-16]. In our patient, the pain had started around 2 months before presentation and had worsened recently, probably associated with the episode of heavy exercise.

Treatment can vary depending on the underlying causes. Therefore, treatment should be arranged according to the etiology. Since BMES is a self-limiting syndrome, the main goal of treatment is to reduce pain and shorten the duration of symptoms. Patients may be advised to rest for 3-6 weeks and NSAIDs are given for symptoms. Oral NSAID can provide symptomatic relief without changing the underlying pathology [9,17,18].



**Fig. 1: Bone marrow edema in the acromion: In the T1 sequence, hypointense appearance (arrow on the left); and in T2 sequence, hyperintense appearance (arrow on the right)**

## CONCLUSION

In a patient presenting with musculoskeletal pain, BMES should be considered in the differential diagnosis, especially after more common reasons are excluded from the study.

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