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Case Report

Supracondylar Process of the Humerus

Humerus'un Suprakondiler Proçesi

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Abstract

The supracondylar process is a congenital bony prominence located on the anteromedial aspect of the distal humerus. Struthers' ligament is a fibrous (occasionally ossified) ligament that extends from the distal end of the supracondylar process to the medial epicondyle. This anatomical feature is typically asymptomatic but may infrequently lead to entrapment syndromes due to compression of nearby arteriovenous structures. This article presents the clinical and radiological findings, along with diagnostic clues, of a supracondylar protrusion incidentally detected in a 14-year-old patient, in conjunction with relevant literature.

Anahtar Kelimeler
humerus
Struthers bağı
konjenital varyasyonlar
suprakondiler proçes

Özet

Suprakondiler çıkıntı, distal humerusun anteromedial tarafında bulunan konjenital bir kemik çıkıntısıdır. Struthers bağı, suprakondiler çıkıntının distal ucundan medial epikondile kadar uzanan lifli (bazen kemikleşmiş) bir bağdır. Bu anatomik özellik tipik olarak asemptomatiktir ancak nadiren yakındaki arteriovenöz yapıların sıkışması nedeniyle sıkışma sendromlarına yol açabilir. Bu makalede, 14 yaşında bir hastada tesadüfen tespit edilen suprakondiler protrüzyonun klinik ve radyolojik bulguları ile tanısal ipuçları ilgili literatür eşliğinde sunulmaktadır.

Introduction

The supracondylar process, also known as the supracondylar spur, is a congenital bony prominence located on the distal anteromedial aspect of the humerus, approximately 5 cm proximal to the medial epicondyle (1). This anatomical feature is typically identified incidentally and is present in around 0.1-2.7% of the general population (2). Its dimensions can range from 2-20 mm (3). Various imaging modalities such as radiography, ultrasound, and magnetic resonance imaging (MRI) can be utilized to detect the supracondylar process. The Struthers' ligament originates from the distal tip of the supracondylar process and terminates at the medial epicondyle. Neurovascular structures, predominantly the brachial artery and median nerve, pass through the circular structure formed by this ligament and the supracondylar process, potentially leading to entrapment syndromes. Nonetheless, the presence of the supracondylar process and Struthers' ligament commonly remains asymptomatic (4,5). In cases where symptoms manifest, a surgical intervention may be warranted, along with conservative measures such as rest and analgesia.

This study aims to present the clinical and radiological findings, distinctive diagnostic indicators, and relevant literature on the supracondylar process. The presence of this anatomical variation was incidentally noted in a 14-year-old patient who sought orthopedic consultation for follow-up after a fall.

Case Report

A 14-year-old female patient was admitted to the orthopedic outpatient clinic for follow-up after a fall. She had no known history of disease in her past medical records. Lateral and anteroposterior radiographs of the left elbow revealed a well-defined, beak-shaped radiodense structure with a smooth surface, sharp border, and continuous appearance from the anteromedial cortex, located approximately 4 cm superior to the medial epicondyle in the distal part of the humerus. There was no evidence of cortical destruction or erosion associated with this structure (Figure 1). The patient was referred to the

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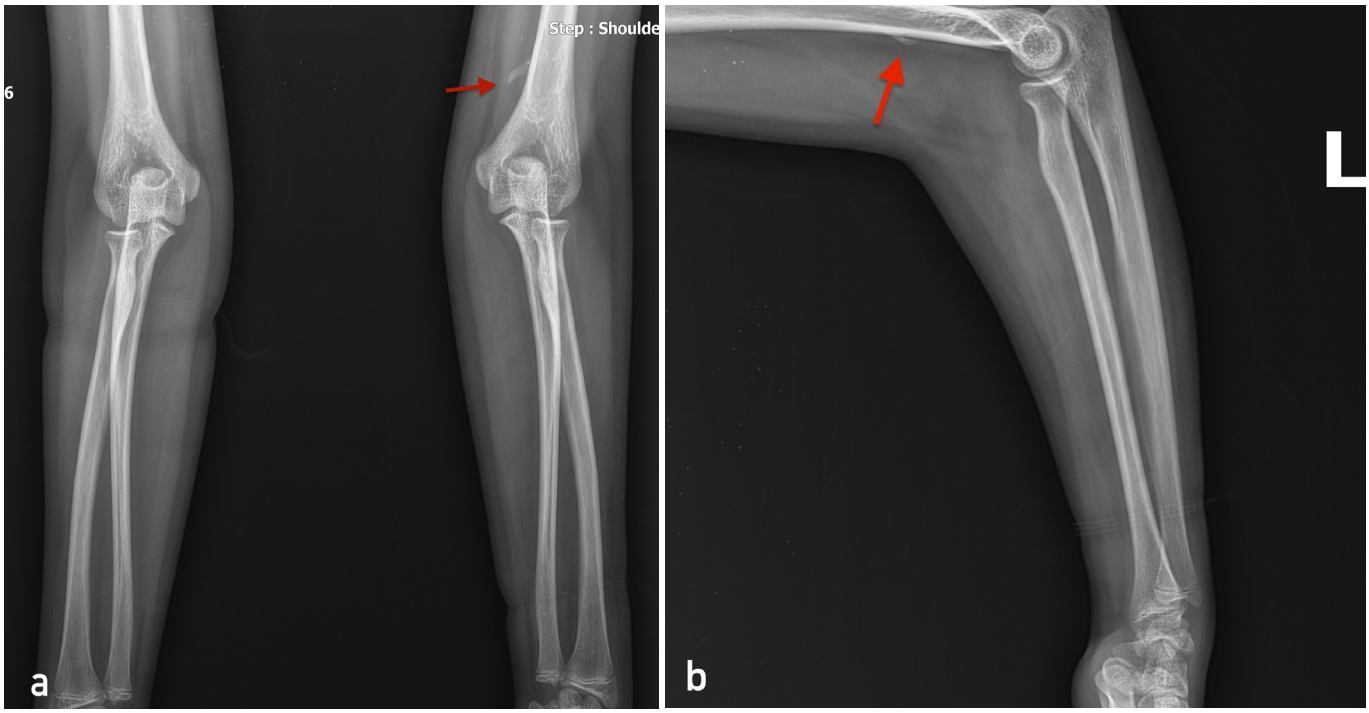

Figure 1: A beak-shaped radiodense structure (red arrow) with a smooth surface observed on anteroposterior **(a)** and lateral radiographs **(b).** This structure is sharply circumscribed and demonstrates continuity from the cortex on the left, superior to the medial epicondyle (red arrow).

MRI unit with a preliminary diagnosis of osteochondroma. The MRI scan revealed a 12.5 mm long, 3.6 mm thick, wide-based structure with continuity with the medial cortex in the distal part of the humerus, approximately 6 cm from the elbow joint. The structure appeared significantly hypointense in T1 and T2-weighted images. It demonstrated continuity with the bony cortex and didn't display medullary bone signal (Figure 2). The structure was closely located in proximity to the brachial artery, brachial vein, and median nerve (Figure 3). It lacked a cartilage cap, a distinguishing feature of osteochondroma. Unlike osteochondroma, its distal end was directed towards the elbow joint. Based on the direct

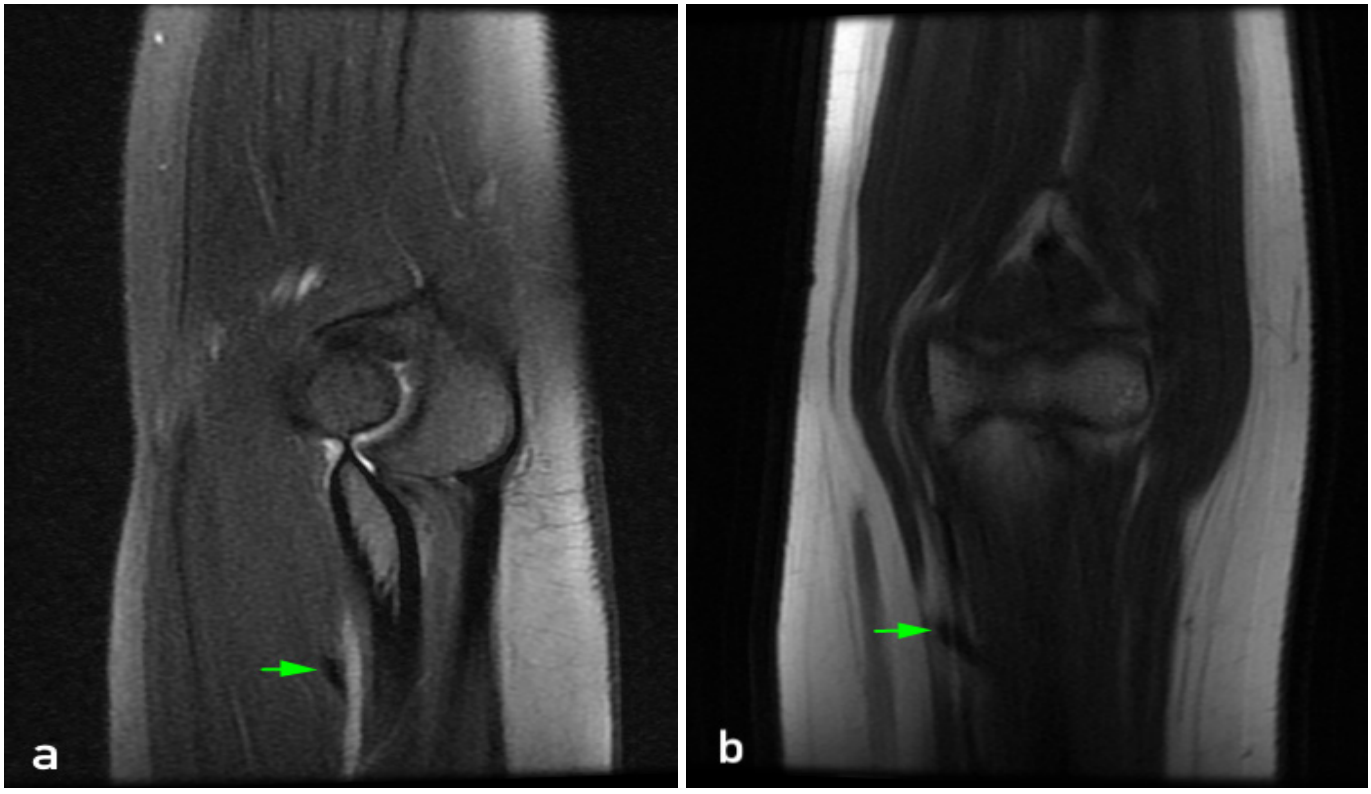

Figure 2: Sagittal T2-weighted (a) and coronal T1-weighted (b) MRI images show a hypointense, slightly oblique transverse structure that is connected to the bony cortex. In contrast to osteochondroma, this structure lacks a medullary bone signal and a cartilage cap (green arrows).

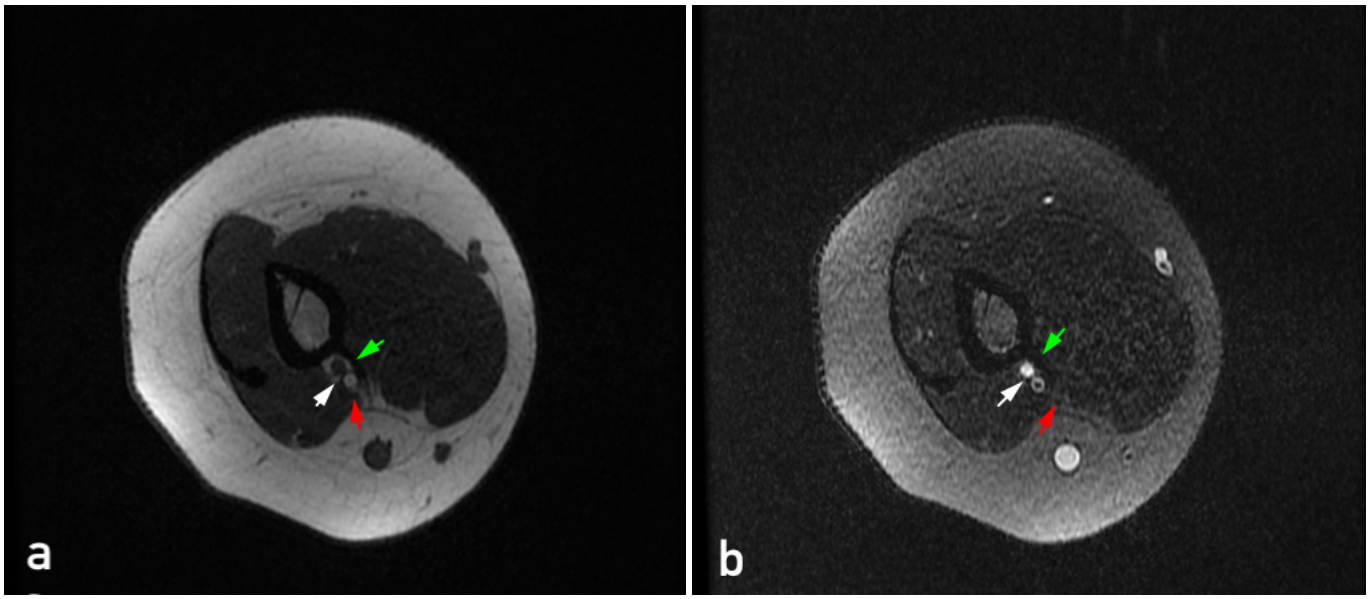

Figure 3: Axial T1-Weighted **(a)** and fat-suppressed T2-Weighted **(b)** images show the lesion (green arrow) positioned closely adjacent to the brachial artery-vein (white arrow) and median nerve (red arrow) without any signs of compression.

radiographic and MRI findings, the structure in question was identified as a supracondylar process. The patient was closely monitored and did not display any symptoms typically associated with the supracondylar process.

Discussion

Struthers' ligament, initially documented by Struthers' and Tiedman, extends from the medial epicondyle to the distal end of the supracondylar process. Its occurrence in humans ranges from approximately 0.1% to 2.7% (2). Struthers' ligament may not always be present alongside the supracondylar process, and even if it is, it might not be detectable on radiological imaging. In our instance, Struthers' ligament was not discernible on the MRI.

The supracondylar process is frequently identified as asymptomatic, as was the case in our study. The supracondylar process syndrome is typically considered when it exerts pressure on neural structures. Symptomatic instances have been documented in literature, predominantly attributed to median nerve compression and less frequently to ulnar nerve compression (6,7). Additionally, cases involving compression of the brachial artery have been reported (8).

Radiography is typically adequate for diagnosis. However, in cases of supracondylar process syndrome, MRI plays a crucial role in revealing neurovascular compression, associated bone fractures, and bone marrow edema. Moreover, MRI is essential for distinguishing between osteochondromas and malignant tumors.

The differentiation between supracondylar process and osteochondroma is based on the orientation of the distal end of the supracondylar process towards the elbow joint, with an intact humeral cortex. Osteochondroma, on the other hand, is characterized by the presence of a cartilage cap and continuity between the humeral cortex, medulla, and the lesion. It is important to note that the supracondylar process can sometimes be mistaken for an ossifying formation like myositis ossificans (9). Ultrasound is infrequently utilized for diagnostic purposes (3).

Once the supracondylar process is identified, the treatment is customized based on the presence of clinical symptoms. Both conservative and surgical treatment strategies have been documented in the literature (5,10).

Conclusion

The supracondylar process represents a congenital anatomical anomaly located in the distal humerus and is often identified incidentally during radiological examinations conducted for unrelated purposes. While it seldom presents symptoms related to fractures or compression of vascular nerves, it is crucial to acknowledge this variation to avoid misinterpretation as benign or malignant lesions, such as osteochondroma, in cases where its existence goes unnoticed. Proficiency in recognizing the radiographic and MRI features of the supracondylar process is imperative for precise differential diagnosis from alternative pathologies and for determining appropriate treatment strategies.

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