



## Pseudotumor Deltoideus in the Left Humerus of a Young Adult Female Patient with Acute Lateral Shoulder Pain: A Case Report

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### Abstract

*Cortical thickening and lucency in the proximal humerus are uncommon radiological findings. Pseudotumor deltoideus was reported for the first time in the literature in 2001 in a study of five cases of asymptomatic, subacute or chronic, and painful pseudotumor deltoideus in the deltoid insertion; it was described as benign in character and possessing various anatomic variations not previously defined. In this paper, by presenting the clinical and radiological findings of a female patient with acute pain in the left shoulder with radiological images indicative of the condition, to the best of our knowledge, this study constitutes the second report in literature and the first case from Turkey of pseudotumor deltoideus. A 30-year-old female presented with an acute-onset of severe pain in the left shoulder. Cortical thickening, irregularity and intracortical lucency were observed at the deltoid insertion. In case of cortical thickening in the proximal humerus deltoid insertion accompanied by irregularity and intracortical lucency associated with acute onset of severe lateral shoulder pain, pseudotumor deltoideus should be considered as a diagnosis. MRI is helpful in the differential diagnosis.*

**Key Words:** Pseudotumor deltoideus, cortical thickening, acute lateral shoulder pain.

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## Introduction

Pseudotumor deltoideus was first mentioned in 2001 by Morgan et al [1] to define the various anatomic variations of benign character in the deltoid insertion. When a chronic avulsion injury of the deltoid tubercle and in the pectoralis major insertion in the proximal humerus has occurred], cortical irregularity has been observed in the deltoid insertion [2-5]. Similar findings have been recorded in the latissimus dorsi insertion [6]. The simultaneous presence of cortical irregularity and pain may mimic infection and lesions such as tumors.

## The Case

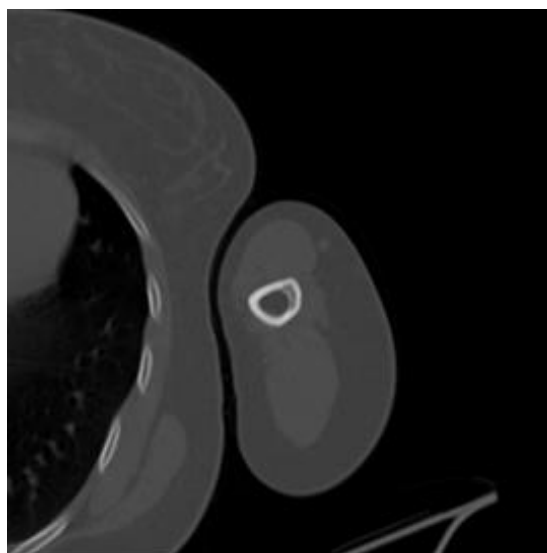
A 30-year-old female medical secretary with dominant right hand presented with complaints of severe pain in the lateral left shoulder and difficulty using the left arm. The pain worsened with activity on raising the left arm. There was no history of trauma, heavy work, or sports activity. During physical examination, there was limited internal rotation and abduction of the left shoulder to 120° and 160° in flexion in addition to evident pain.

The Neer and Hawkins impingement tests were also positive. Haemogram and routine biochemistry values and serological test results were within normal limits. We observed well-defined cortical thickening, expansion, irregularity, and intracortical linear lucency in the deltoid insertion by direct radiography (Figure 1). Computed tomography (CT) uncovered a slightly hypo dense lesion with an intracortical location (Figure 2).

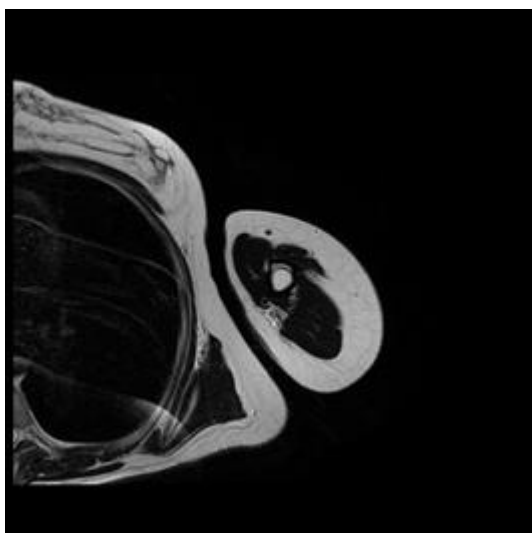
On magnetic resonance imaging (MRI), cortical thickening measured approximately 5.5 cm, and hyper intensity, causing expansion and irregularity, was observed on T<sub>1</sub>- and T<sub>2</sub>-weighted images (Figure 3). Contrast involvement was not evident after examination with contrast on fat-suppressed sequences (Figure 4). With these clinical and radiological findings were brought diagnose of pseudotumor deltoideus. Because the patient did not benefit from nonsteroidal and anti-inflammatory analgesic medications, we initiated 3-weeks physiotherapy program on an outpatient basis for the left shoulder.



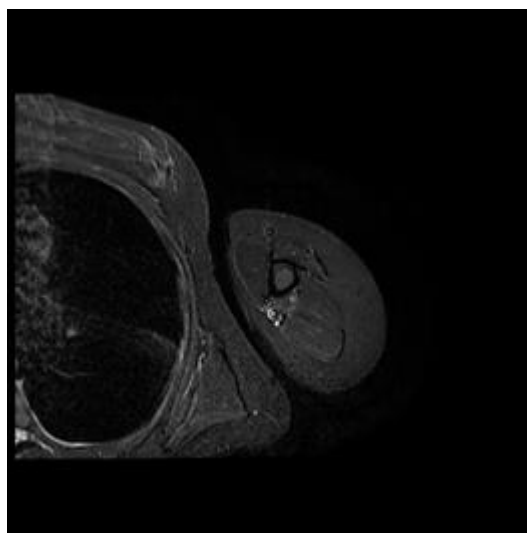
**Figure 1.** Left humerus AP radiograph showing well-defined cortical thickening, expansion, mild irregularity on the endosteal surface and intracortical linear lucency in the deltoid muscle attachment area on the lateral of the left humerus.



**Figure 2.** Axial CT showing a slightly hypo dense lesion causing expansion and thickening in the anterolateral of the proximal humerus.

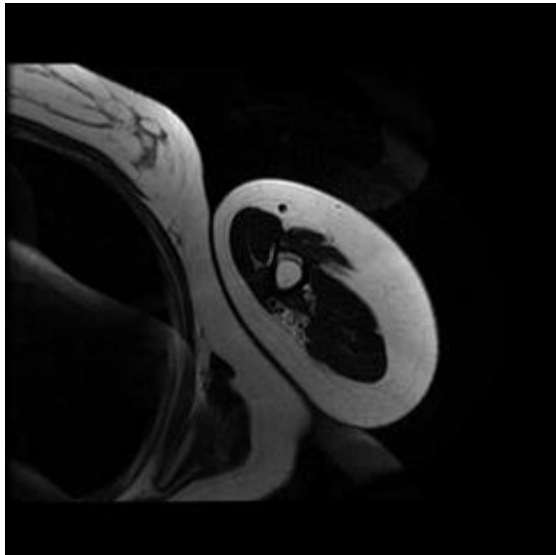


**Figure 3.** Axial T2-weighted image showing intracortical hypo intensity causing cortical thickness and expansion at the humerus deltoid insertion.

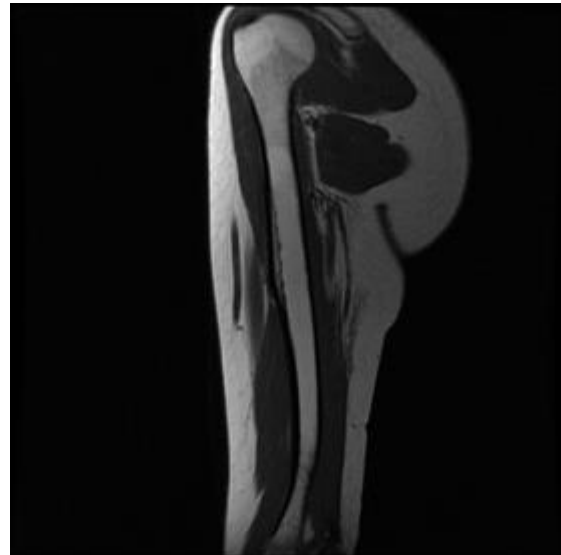


**Figure 4.** Axial STIR MRI showing cortical thickening and intracortical hyper intensity

At the 3-month follow-up examination, shoulder pain severity was evaluated as 2 on visual analog scale (VAS), and no change was observed via direct radiography and MRI (Figures 5-6). The shoulder joint range of motion was full, and the patient could use her left arm in daily activities with minimal pain. Further follow-up after 3 months was recommended.



**Figure 5.** Axial T2-weighted follow-up MRI showing cortical thickening, expansion and an intracortical hyper intense area on the lateral of the left proximal humerus.



**Figure 6.** Sagittal T1-weighted follow-up MRI showing cortical thickening at the deltoid tendon insertion, expansion and irregularity causing intracortical hyper intensity.

## Discussion

The presence of cortical thickening, irregularity and lucency in the deltoid insertion area of the proximal humerus together with shoulder pain can lead to unnecessary biopsy or radical treatment on the suspicion of a neoplastic lesion.

Damron et al [7] observed a similarity between sarcoma symptoms and some sports-related injuries or pseudotumors and indicated that they could be a cause of potentially excessive treatment.

According to Morgan et al [1] of five patients aged 25-76 years, three were male and two were determined to be asymptomatic. In the three symptomatic patients, complaints included

lateral shoulder and upper arm pain persisting for 10 weeks, 4 months, and 1 year. In their study, pseudotumor deltoideus was observed in the dominant arm of two patients. Our clinical findings were similar to those in the symptomatic cases described by Morgan et al, who reported shoulder pain as chronic or subacute. However, here we noted acute shoulder pain.

In patients diagnosed with pseudotumor deltoideus by Morgan et al [1], cortical thickening, irregularity, and intracortical lucency were observed on direct radiographs, generally in the deltoid insertion area. In addition to hyper intensity on T<sub>1</sub>- and T<sub>2</sub>-weighted images, and cortical thickening in the deltoid insertion area on axial sections not accompanied by edema in the bone marrow or adjacent soft tissue [1].

Donnelly et al [6] reported the imaging findings of three adolescents aged 13-16 years with a history of sport or intense activity who were diagnosed with chronic avulsion injury of the deltoid tubercle. Cortical thickening and irregularity were reported to have been observed in the deltoid insertion in the dominant arm.

According to Donnelly et al [6], high signal intensity was reported within the thickened cortex at the deltoid insertion site on T<sub>2</sub>-weighted images, and a signal increase was observed associated with or without edema in the soft tissue adjacent to the deltoid insertion. In the current case, cortical thickening and irregularity, and intracortical lucency were observed in the deltoid insertion. The findings on direct radiographs were consistent with pseudotumor deltoideus and chronic avulsion injury of the deltoid. On magnetic resonance imaging (MRI), no edema was observed in the soft tissue adjacent to the deltoid insertion. Pseudotumor deltoideus was diagnosed after considering patient age, no history of injury from sports or other intense activity.

## Conclusions

In young patients with acute onset, severe lateral shoulder pain, where cortical thickening in the proximal humerus deltoid insertion is accompanied by irregularity and intracortical lucency, a diagnosis of pseudotumor deltoideus should be considered. MRI is helpful in the differential diagnosis.

**References**

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