



E-ISSN: 2707-8353
P-ISSN: 2707-8345
IJCRO 2024; 6(2): 07-09
www.orthocasereports.com
Received: 12-06-2024
Accepted: 13-07-2024

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Practicing restraint after incidental finding of Pseudotumor deltoideus: A case report

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DOI: <https://doi.org/10.22271/27078345.2024.v6.i2a.212>

Abstract

Pseudotumor deltoideus refers to a benign anatomic variation of the humerus at the site of deltoid insertion. These lesions typically present with shoulder and/or arm pain and decreased range of motion, but may be found incidentally. On plain radiographs, a pseudotumor deltoideus is an area of cortical thickening with intracortical lucency at the region of the deltoid tuberosity. This relatively uncommon finding casts a diagnostic gray cloud over radiologists and musculoskeletal experts because of its similarity to aggressive periosteal reactions and lucencies seen in more threatening neoplastic conditions and infections. We present a case of a 25 year old female patient with intermittent right shoulder and neck pain associated with numbness and tightness radiating down the right arm to the wrist. Radiographs of the right shoulder revealed an area of cortical thickening in the right humeral diaphysis at the level of the deltoid insertion, which was diagnosed as pseudotumor deltoideus. Physicians that treat musculoskeletal conditions should feel comfortable with how to differentiate this diagnosis in order to reduce patient discomfort and medical fees secondary to unnecessary biopsies or blood work.

Keywords: Pseudotumor, deltoideus, incidental, benign, unnecessary biopsies or blood work.

Introduction

Pseudotumor deltoideus refers to a benign anatomic variation of the humerus at the site of deltoid insertion^[1]. The term was created in 2001 by Morgan, et. al, in reference to a spectrum of anatomical variations that their team encountered while reviewing five cases of unusual radiographic findings of the proximal humerus. The etiology of these lesions are not yet fully understood, but it is possible that each variation has a different etiology, including tendinitis, avulsive cortical irregularities, and herniation pits^[1]. Generally, on plain radiographs, a pseudotumor deltoideus is an area of cortical thickening with intracortical lucency at the region of the deltoid tuberosity^[1-3]. These lesions typically present with arm shoulder and/or arm pain and decreased range of motion, but may be found incidentally^[1-4]. This relatively uncommon finding casts a diagnostic gray cloud over radiologists and musculoskeletal experts because of its similarity to periosteal reactions and lucencies seen in more threatening neoplastic conditions and infections, leading to unnecessary workup.

Case Report

A 25 year old female patient with non-contributory past medical history presented to an orthopedic clinic with complaints of intermittent moderate right shoulder and neck pain with numbness and tightness radiating down the right arm to the wrist. The patient reported the shoulder and neck pain had been present for about one and a half years following a muscle spasm in the neck, and denied any other traumas or major illnesses. Upon physical examination, the right cervical, sternocleidomastoid, trapezius and latissimus dorsi muscles were hypertonic and tender to palpation. Full range of motion was present in the cervical spine and shoulder girdle; however, the patient reported pain in the anterior shoulder during the empty can test. X-rays of the cervical spine were performed in AP, oblique, and lateral views, and X-rays of the right shoulder were performed in AP and Y views. The lateral cervical spine radiograph revealed mild foraminal encroachment at C6/C7 on the right side, mild posterior spurring at C5, and straightening of cervical lordosis above C5. The right shoulder radiograph revealed an area of cortical thickening in the right humeral diaphysis at the level of the deltoid insertion. Based on clinical and radiographic findings, the patient was diagnosed with mild cervical foraminal stenosis on the right side, and the periosteal reaction was diagnosed as an incidental pseudotumor deltoideus.

No further workup of the pseudotumor deltoideus was warranted because of the cervical radiographic findings that explained the patient's symptoms. The patient was treated conservatively for the neck and shoulder pain secondary to cervical foraminal stenosis with NSAIDs, heat therapy, stretching exercises, and massage therapy with improvement. The patient was instructed to undergo further workup with orthopedic surgery if her symptoms worsened.



Fig 1: AP view of left shoulder in external rotation showing cortical thickening at deltoid insertion



Fig 2: AP view of left shoulder in internal rotation showing cortical thickening at deltoid insertion



Fig 3: Oblique view of cervical spine with slight posterior spurring at C5 and foraminal encroachment at C6-C7

Discussion

The purpose of this report is to shed light on this rare, likely underreported phenomena, and how to differentiate it from other pathologies with overlapping clinical symptoms and cortical irregularities on imaging. In a patient presenting with upper extremity pain and an irregular bony abnormality on plain radiographs, malignancy and infection should first be ruled out with a comprehensive patient history and further evaluation with CT, MRI, or radionuclide bone scan, if necessary ^[1, 3, 6]. Imaging findings such as medullary bone destruction and aggressive periosteal reactions including Codman triangles, “onion skinning” and “sunburst patterns” are concerning for malignancy ^[7]. Additionally, concerns for an infectious or malignant process would most often include pain at the area of the lesion, particularly nighttime pain, increasing soft tissue swelling and warmth, as well as systemic symptoms such as significant weight loss, fevers, and fatigue. Comparatively, imaging findings seen with pseudotumor deltoideus include cortical thickening at the level of the deltoid insertion and a lower grade periosteal reaction resembling a callus on plain radiograph and CT. On MRI, cortical abnormality with hypointensity on T1-weighted images, and hyperintensity on T2-weighted images may be seen, although hyperintensity may be indicative of an avulsive injury and subsequent inflammation ^[2]. Bone scan may reveal little to no uptake by the lesion ^[1]. This spectrum of findings differs from neoplastic bone tumors in its smooth, well-defined borders on X-ray or CT, lack of marrow or soft tissue involvement on MRI, and minimal uptake on bone scan ^[1, 6]. The specific location at the insertion of the deltoid, combined with these characteristic findings on imaging, should clue the provider to a pseudotumor deltoideus, and a detailed patient history can assist in its prompt diagnosis. Lack of involvement in sports or exercise and lack of previous injury can help differentiate a pseudotumor from an avulsive injury, and skeletal maturity can help differentiate from non-ossifying fibromas. Repeat X-rays may be considered to monitor for progression of the lesion, however most cases follow an indolent course and remain unchanged on repeat imaging. Conservative treatment with NSAIDs, heat therapy, and physical therapy is recommended.

Pseudotumor deltoideus are often found incidentally, particularly when evaluating shoulder and/or arm pain. In this case, the location of the lesion at the level of the deltoid insertion coupled with the cervical pathology explaining the neck and shoulder symptoms strongly indicates a pseudotumor deltoideus, and meant further workup was not warranted. Such cases should not be biopsied and should be managed clinically, especially when systemic symptoms are not present. While the exact etiology of pseudotumor deltoideus is not well-defined, some possibilities include tendinitis, increased muscle tension, or mechanical stress^[1, 2]. Most patients present initially with shoulder and/or arm pain, and physical examinations may identify abnormalities in range of motion testing in the rotator cuff and shoulder girdle^[1-3]. While uncommon, awareness of pseudotumor deltoideus is important for radiologists and providers involved in musculoskeletal care to avoid unnecessary invasive testing^[2, 3, 5].

Conclusion

It is imperative to include pseudotumor deltoideus on the differential diagnosis for a skeletally mature patient with shoulder and/or arm pain and cortical thickening of the proximal humerus on radiographic imaging. While the diagnosis may be tricky, CT and MRI can be helpful diagnostic tools when suspicion remains for an infectious or malignant process after obtaining a thorough clinical history. In the case of a pseudotumor deltoideus, CT or MRI should not show any aggressive periosteal reactions, bone marrow abnormalities, soft tissue edema, or masses. Physicians that treat musculoskeletal conditions should feel comfortable with how to differentiate this diagnosis in order to reduce patient discomfort and medical fees secondary to unnecessary biopsies or blood work.

Acknowledgments

Conflict of Interest: The authors declare no conflict of interest.

Financial Support: The authors declare no financial support.

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How to Cite This Article

Blanca A, Donahue D, Vanni S. Practicing restraint after incidental finding of Pseudotumor deltoideus: A case report. *International Journal of Case Reports in Orthopaedics.* 2024;6(2):07-09.

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