

# A rare case of pseudotumor deltoideus encountered in stroke rehabilitation

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## SUMMARY

Although post-stroke shoulder pain is a common medical complication among the stroke population, pseudotumor deltoideus which is non-malignant is rarely seen. This case report demonstrates a thorough history, physical examination followed by the relevant investigations are essential when managing a common post-stroke complication. We postulate that pseudotumor deltoideus is likely a pre-existing asymptomatic variant in our patient before the stroke and has presented symptomatically after the stroke due to the associated neurological and musculoskeletal impairments. As post-stroke shoulder pain is associated with unfavourable outcomes, it is important to recognise the underlying causes of post-stroke shoulder pain early and institute prompt appropriate treatment.

## INTRODUCTION

Pseudotumor deltoideus is a non-malignant anatomic variant at the deltoid insertion site and is an uncommon cause of shoulder pain. We describe a case of post-stroke shoulder pain with striking radiological features of pseudotumor deltoideus and its appropriate management.

## CASE REPORT

A 60-year-old man with a history of left corona radiata infarct who was right-hand-dominant reported right-sided shoulder and lateral arm pain six weeks post-stroke while receiving inpatient rehabilitation. There was no history of trauma. He was initially treated for post-stroke shoulder pain secondary to spasticity and rotator cuff tendinopathy. Clinical examination showed a Modified Ashworth scale of two in his right pectoralis major, biceps, triceps and wrist flexors on examination. Hawkins Kennedy test reproduced pain over the right lateral arm with limited passive range of motion of right shoulder abduction (70 degrees) and flexion (60 degrees). A tender taut band was palpated over his right deltoid muscle insertion area. He was started on oral baclofen, topical non-steroidal anti-inflammatory (NSAID) gel, followed by combination of oral paracetamol and orphenadrine. As he had impaired renal function, oral NSAIDs were not used. Analgesics were eventually escalated to codeine. He continued to receive physiotherapy and occupational therapy which consisted of gentle range of motion exercises and strengthening of his right shoulder which included functional electrical stimulation to shoulder elevators. His pain score reduced from 5/10 to 2/10 on the visual analogue scale.

Ultrasound of his right shoulder showed a full-thickness tear in his supraspinatus tendon and a partial-thickness tear in his subscapularis tendon. X-ray showed cortical thickening over the right lateral humeral shaft, at the deltoid insertion (Figure 1). Magnetic resonance imaging (MRI) showed a smooth bony protuberance in the lateral aspect of the humerus at the insertion of the deltoid muscle (Figure 2), without abnormal bone marrow oedema or periosteal reaction around the region of the humeral shaft. These radiological findings were consistent with the features of pseudotumour deltoideus.

## DISCUSSION

Post-stroke shoulder pain is common and its incidence in stroke population varies between 34%-84%.<sup>1</sup> Common causes include central post-stroke pain, complex regional pain syndrome, spasticity, joint contractures, glenohumeral joint subluxation or rotator cuff injuries.<sup>1</sup> To the best of our knowledge, this is the first case report of pseudotumor deltoideus described in a post-stroke patient.

Patients with pseudotumor deltoideus could either present symptomatically with pain or asymptotically with incidental radiological findings.<sup>2</sup> Pseudotumor deltoideus is non-malignant and its radiological features include cortical thickening, lucency at or adjacent to the deltoid tuberosity, focal cortical irregularities at the deltoid insertion, slightly increased uptake on bone scans, adjacent eccentric marrow abnormality on MRI and computed tomography (CT) scans.<sup>2,3</sup> Pseudotumor deltoideus refers to anatomic variants at the deltoid insertion site and its exact cause is unclear.<sup>2</sup> Its differentials include osteoid osteoma, non-ossifying fibroma, infection, bone erosion associated with calcific tendonitis, chronic avulsive injury, and normal anatomic variant.<sup>2,3</sup> Clinical guidelines on whether x-rays alone are sufficient for the diagnosis of pseudotumor deltoideus are unclear, although its non-malignant features such as smooth, well-demarcated border and typical deltoid insertion site could be identified on plain radiographs.<sup>4</sup> Several authors recommend MRI to confirm the diagnosis of pseudotumor deltoideus so as to either avoid unnecessary biopsy and surgery or to exclude other differential diagnoses.<sup>2,3,5</sup> Morgan et al., suggested plain radiographs, CT and MRI scans could be of use in delineating the lesions and recommended follow-up with serial x-rays to make sure the process was benign.<sup>2</sup> Management of pseudotumor deltoideus includes treatment of associated rotator cuff injuries and physiotherapy.<sup>2</sup> Biopsy and surgery are often not indicated.<sup>2,3</sup> Data on the long-term outcomes of

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**Fig. 1:** X-ray shows cortical thickening over the humeral shaft, at the deltoid insertion.



**Fig. 2:** Sagittal MRI of the right humerus (T1-weighted sequence) shows hyperintense cortical irregularity of the lateral humeral shaft at the deltoid insertion site.

pseudotumor deltoideus is scarce. Based on the case series of five patients with pseudotumor deltoideus, four patients had no reported radiological change in the lesion over a two year follow-up, of whom two had improvement of pain, and two remained asymptomatic;<sup>2</sup> one patient defaulted further follow-up which led to no repeated radiological imaging but the authors reported the patient responded well to shoulder rehabilitation program after the initial assessment.<sup>2</sup>

### CONCLUSION

This case highlights the striking radiological finding of pseudotumor deltoideus which is rarely encountered in post-stroke shoulder pain. As this case demonstrates, a thorough history, physical examination followed by relevant investigations are still essential when managing a common post-stroke complication as rare differential diagnosis could still be encountered. We postulate pseudotumor deltoideus is likely to have pre-existed in our patient as an asymptomatic anatomic variant prior to stroke. The new stroke with resultant right-sided upper limb weakness and rotator cuff pathology could have possibly caused the pain to manifest.

As post-stroke shoulder pain is associated with unfavourable outcomes such as reduced functional use of the affected arm, limited rehabilitation, increased length of hospital stay and increased depression incidence, it is important to recognise the underlying causes of post-stroke shoulder pain early and institute prompt appropriate treatment.<sup>1</sup>

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