

# Isolated infraspinatus atrophy due to suprascapular neuropathy presenting as abnormal shoulder posture

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## Abstract

Isolated infraspinatus atrophy is rare and difficult to confirm based on physical examination, although external rotation lag signs may provide a clue to the diagnosis. We present a case of isolated infraspinatus weakness caused by suprascapular neuropathy presenting as abnormal shoulder posture.

**Keywords:** Infraspinatus muscle, suprascapular nerve, magnetic resonance imaging, shoulder

## INTRODUCTION

Isolated infraspinatus atrophy, a common condition among volleyball athletes, affects shoulder rotation and is caused by suprascapular nerve injury.<sup>1,2</sup> Idiopathic isolated infraspinatus atrophy, which has no apparent cause, is very rare. It is difficult to confirm the diagnosis based on physical examination, although external rotation lag signs may suggest the diagnosis.<sup>1,2</sup> We present here a case of infraspinatus atrophy due to suprascapular neuropathy, the diagnosis was based on shoulder MRI images, where the patient had no symptoms of infraspinatus weakness. In the absence of commonly known symptoms of infraspinatus weakness, this case may represent a new physical examination of infraspinatus weakness based on the expression of the symptoms in a special posture.

## CASE REPORT

A 48-year-old man visited the neurology department with a 2-month history of abduction of his right shoulder when he tried to adduct both upper arms in order to wash his face (Figure 1A). Although he reported experiencing pain in the right shoulder two months earlier, his symptoms resolved, and he exhibited no sensory abnormalities. His medical history was unremarkable, and he reported no history of trauma, peripheral neuropathy, or cervical radiculopathy. Physical examination revealed atrophy of the right infraspinatus muscles. He exhibited 4+/5 strength during abduction and

external rotation. No Spurling's signs were observed on the right side, and the remainder of the upper extremity examination was normal. He was initially diagnosed with suspected brachial plexopathy. Although we recommended electromyography for differential diagnosis, he declined electromyography and nerve conduction studies due to the fear of pain, electrical stimulation, and needles. Magnetic resonance imaging (MRI) was performed to localize the lesion in the brachial plexus. Shoulder MRI revealed T2 hyperintensity and fatty changes in the right infraspinatus muscle (Figure 2, arrowhead) and prominent high signal intensity in the right suprascapular nerve (Figure 2, arrow). After three months of conservative treatment, he had substantial improvements in strength, and posture was restored in the affected arm (Figure 1B). Some improvement in the atrophy was also observed.

## DISCUSSION

Isolated suprascapular neuropathy is a rare peripheral neuropathy that is easily overlooked by clinicians. The most common causes of solitary shoulder pain syndrome are trauma and pressure from a ganglion cyst. It is known to occur when playing volleyball or badminton, which are sports that require frequent lifting of the arms over the shoulder.<sup>3,4</sup>

Isolated infraspinatus damage due to suprascapular nerve palsy can be difficult to diagnose by physical examination because the symptoms are not severe.<sup>1,2</sup> To diagnose

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Figure 1. Infraspinus damage due to suprascapular neuropathy. The patient showed right shoulder abduction during face washing at the initial examination (A) and improvements in posture at the 3-month follow-up (B).

suprascapular neuropathy, electrophysiologic tests are usually performed. MRI is necessary to determine the cause of the neuropathy such as rotator cuff abnormality and space-occupying lesions along the nerve.<sup>2</sup> Our patient had difficulties in undergoing an electrophysiologic study; hence, neuropathy had to be diagnosed through MRI.<sup>3,4</sup> The supraspinatus and infraspinus muscles are usually both atrophied in suprascapular neuropathy; however, isolated infraspinus atrophy may appear in nerve lesions distal to the spinoglenoid notch. In this case, no apparent cause was found around the spinoglenoid notch that could cause isolated infraspinus atrophy. In our patient, suprascapular neuropathy presented with atypical physical findings; our findings suggest that examination during specific postures (e.g., washing the face) can help localize lesions in

conjunction with physical examination findings such as the presence of external rotation lag signs (which can be used to detect infraspinus damage),<sup>1,2</sup> electrophysiologic tests, and MRI. These findings suggest that examination of movements in various postures can aid in localizing damage in suprascapular neuropathy.

## DISCLOSURE

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Conflict of interest: None

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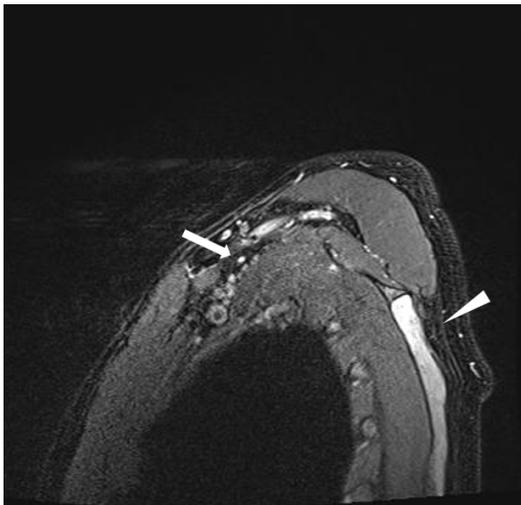


Figure 2. T2-weighted magnetic resonance imaging of the right shoulder with contrast enhancement. High signal intensity was observed in the suprascapular nerve at the spinoglenoid notch (arrow), along with high signal intensity and fatty changes in the infraspinus muscle (arrowhead).