

Anomalous Rib and Nonunion of a First Rib Fracture Causing Thoracic Outlet Syndrome

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ABSTRACT

HISTORY: An 18-year-old male right hand dominant football player with past medical history of complete right ACL tear presents with chronic right neck and shoulder pain for two years after a shoulder press exercise. Four months later, he fell from a fence with his right arm outstretched. One year after the initial event, during football training, he sustained a shoulder injury with a pop under his shoulder blade.

PHYSICAL EXAM: There is asymmetry of the trapezius muscles with obvious indentation of the right anterior supraclavicular region compared to the left. There is also subluxation of the right ulnar nerve at the elbow, with negative Tinel sign at the cubital tunnel or Guyon canal.

DIFFERENTIAL DIAGNOSES:

1. Muscle strain (e.g., levator scapulae or trapezius mm.)
2. Neurogenic thoracic outlet syndrome
3. Arterial thoracic outlet syndrome
4. Venous thoracic outlet syndrome

TEST AND RESULTS: X-rays at the current visit reveal bilateral chronic stress fractures of the first ribs with non-union. These x-ray results along with the patient's symptoms are consistent with a neurogenic thoracic outlet syndrome (nTOS). Follow-up EMG of the right upper extremity muscles was normal.

Because of the patient's neuropathic symptoms and potential nTOS, an MRI was ordered to evaluate for possible right brachial plexus pathology. MRI is significant for pseudoarthroses of the bilateral first ribs with secondary superior kinking of the right T1 and to a lesser degree right C8 nerve roots.

FINAL WORKING DIAGNOSIS: Neurogenic thoracic outlet syndrome (nTOS) Secondary to mass effect from anomalous rib and nonunion of a first rib fracture.

TREATMENT AND OUTCOMES: This patient's treatment regimen for neurogenic thoracic outlet syndrome included planning for surgical removal of the right first rib by the plastic surgery and vascular surgery team versus physical therapy. The patient's recovery would entail rehabilitation through physical therapy and is now ongoing. He has not required surgical intervention.