

FROM SYMPTOMS TO SOLUTIONS: A CASE REPORT ON UTILIZING MRI FOR ACCURATE DIAGNOSIS OF RIB FRACTURES IN SWIMMERS

Sidharth Sahni DO DPT CSCS, Ruben Dovlatyan DO, Brandon Burg DO MS, Gabrielle Avancena MD, David Jevotovsky MD MBA, M.D., Salvador Portugal DO MBS

Physical Medicine & Rehabilitation

CASE DESCRIPTION

We present the case of a 38-year-old male with a remote history of right-sided subscapularis tendon and labrum surgical repair, who presented to Physiatric Interventional Spine & Sports Medicine clinic with complaints of new right-sided periscapular throbbing pain, provoked by swimming more than 1 lap. The patient's pain was not significantly reduced with a course of Physical Therapy and consultation with movement specialist. He also reported right-sided neck pain, worsened with overhead lifting. Patient is highly physically active and exercises frequently, including resistance training, running, and swimming.

Physical exam was significant for pain at end-range cervical extension and right-sided facet joint loading pain, and tenderness to palpation over the right inferior periscapular musculature, despite otherwise normal range of motion. Neurosensory, reflex, and strength exam were within normal limits, without radicular or shoulder impingement signs on examination. Chest radiography was unremarkable. Though initially myofascial syndrome and scapulothoracic bursitis were suspected based upon subjective and examination findings, a chest wall MRI was ordered to rule out occult fracture. It revealed increased T2 signal intensity in the posterior right second and third ribs, suggestive of nondisplaced fracture.

FIGURE 1. RIB 3 POSTERIOR T2 ENHANCEMENT

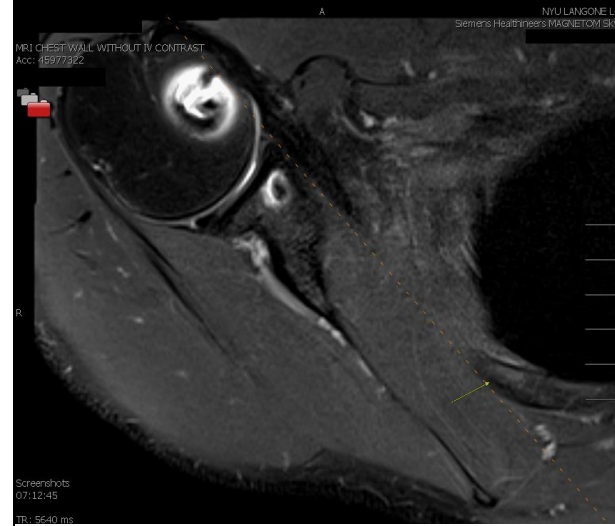
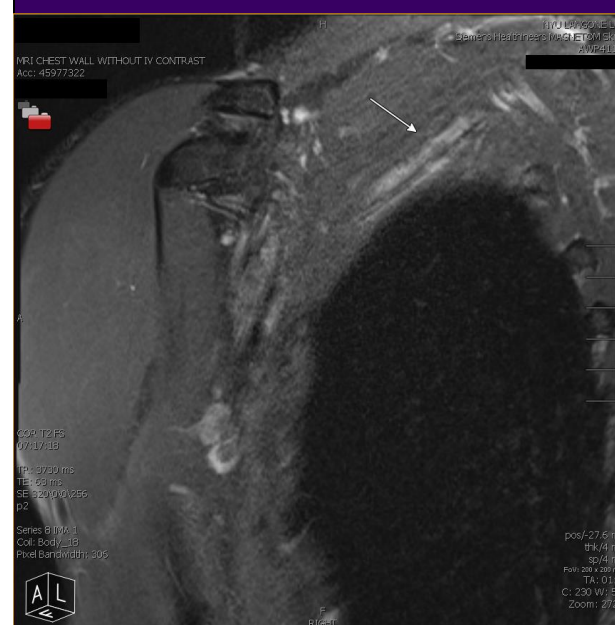


FIGURE 2. RIB 2 POSTERIOR T2 ENHANCEMENT



DISCUSSION

Stress fractures are caused by osteoclastic-predominant adaptive bone remodeling due to repetitive, submaximal musculoskeletal loading. Though most commonly affecting the lower extremities, they can also occur in atypical sites like the ribs.¹ Patients typically present with localized bone pain aggravated by activity or pressure and relieved with rest. This pain can be persistent after the fracture has healed, making chronic pain management a key concern. Plain radiographs are often used initially to detect stress fractures, though their sensitivity is limited. The American Medical Society of Sports Medicine endorses MRI as the study of choice for early diagnosis, due to the false positive rate of plain radiography, as seen in our patient.² Clinicians must be cautious not to overlook a diagnosis in patients with negative radiographs, especially those who continue to experience pain. A multidisciplinary approach to both acute and chronic pain management, including pharmacologic interventions, physical therapy, rest, and the consideration of cognitive-behavioral strategies is essential for both reducing pain, preventing recurrence, and enhancing quality of life.

CONCLUSIONS

In this case, we highlight an incidence of initially negative plain radiography, with subsequent chest wall MRI elucidating a diagnosis of chest wall fracture. This case, among sparse others, demonstrates the importance of awareness and a broad differential diagnosis among clinicians. While rib fractures in athletes, particularly swimmers, are rare, reported incidences range from 0.58 to 1.66 percent athlete exposure.³ Given the limited literature on osseous chest wall injuries in swimmers, especially those utilizing MRI, there is a clear need for increased clinical awareness of this diagnosis and the diagnostic utility of MR imaging. Additionally, plain radiographs have shown false negative rates as high as 60% in such cases. Though CT has been accepted as the next step imaging modality in suspected rib fractures after plain radiography, data has shown that use of MRI leads to an increased diagnostic rate as compared to CT. The high sensitivity of MRI and ability to evaluate indirect signs of a fracture make it the optimal imaging choice when an occult fracture is suspected.⁴ Thus, MRI can be a valuable diagnostic tool to consider in the clinician's arsenal, when appropriately armed with clinical awareness and a wide differential diagnosis.

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