

Presentación del caso

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She is a twenty-seven-year-old female with history of sepsis by *Staphylococcus epidermidis* secondary to infection during breast surgery three months ago, with no other relevant background. She consults ER due to acute shoulder pain associated with oedema and functional impairment in right shoulder, which started three hours after intense physical activity in CrossFit, where she made flexion-extension movements of upper limbs with weight. We take AP and lateral X-rays of her right shoulder, which do not show relevant findings. She is prescribed treatment with local ice, pain-killers and also motor kinesiology with magnetotherapy; she does with partial improvement in two sessions. One week later she develops non-painful oedema in her right upper limb radiated from root to hand, associated with paresthesia, decrease in sensitivity and limitation on mobility. She is made to undergo venous echo-Doppler to rule out deep venous thrombosis. She is then asked to undergo shoulder/upper limb MRI to study her further and appreciate the extension of her disorder.

Imaging studies' findings and interpretation

Fluid-sensitive-weighted MRI-images show signal distortion in supraspinatus and infraspinatus muscles, as well as clavicle and acromial deltoid muscle attachments (Figures 1-4). In our case, T1-weighted MRI sequences were normal (Figure 5).



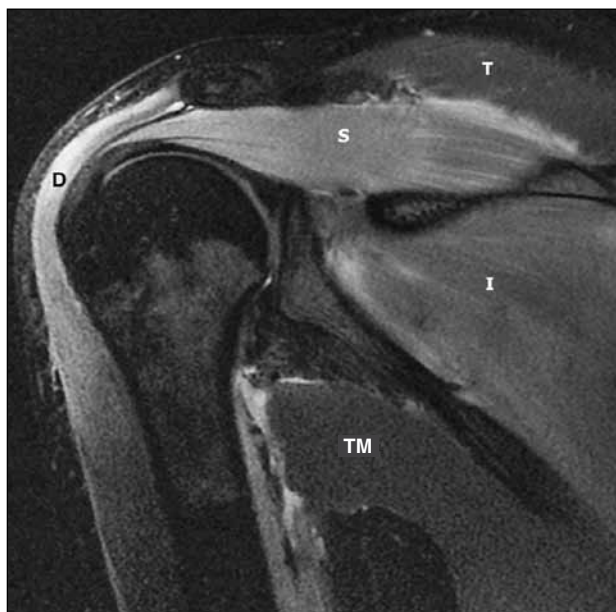
Figure 1. Axial proton density (PD)-weighted MRI sequence (1900/39.9) with fat suppression. There is diffuse increase in signal in the muscle bellies of the supraspinatus (S) and the infraspinatus (I) muscles, and the clavicle belly of the deltoid muscle (D). This findings should be compared with normal muscle signal in this sequence, as it shows in pectoralis major (PM) and subscapularis (Sb) muscles.



▲ **Figure 2.** Axial PD-weighted MRI sequence with fat suppression (1900/39.9). A section slightly lower than that in Figure 1, showing typical denervation pattern in belly of infraspinatus muscle (I). Deltoid muscle (D) is just partially compromised, with damage in clavicle belly. Tm = teres minor muscle, Sb = subscapularis muscle. Arrows show some oedema in subcutaneous soft tissues.



▲ **Figure 3.** Sagittal PD-weighted MRI (1600/42.2). This section shows clearly supraspinatus (S) and infraspinatus (I) muscles compromised, both innervated by the suprascapularis nerve. Sb= subscapularis muscle, TM= teres major muscle, Tm= teres minor muscle.



◀ **Figure 4.** Axial PD-weighted MRI with fat suppression (2100/53.5). This section shows denervation in supraspinatus (S), infraspinatus (I) and Deltoid (D) muscles, what conveys damage in the suprascapularis nerve and the axial nerve, respectively. Trapezius muscle (T) and teres major muscle (TM) show the normal signal of skeletal muscle in this sequence.



▶ **Figure 5.** Axial T1-weighted MRI (500/10). This sequence does not show changes in trophism or signal in the different muscle groups, since this is an acute disorder. This sequence is useful to assess hypotrophy and fat infiltration in chronic cases.

Disorders also show in the brachial region, where it compromises the medial and lateral heads of the triceps muscle (Figures 6 and 7). This alteration consists of some diffuse increase in the signal in fluid-sensitive-weighted sequences, suggestive of oedema. Although muscle oedema is an unspecific finding in MRI, selective muscle or muscle groups distribution suggests denervation origins. On the grounds of the specific innervation of the different muscles in the scapular girdle, it is possible to infer which peripheral nerve is the one affected in each case. In this one we suspect the damage of the suprascapular (supraspinatus and infraspinatus muscles), axilar (deltoid muscle) and radial (triceps muscle) nerves. Not detecting any compressive cause neither in the brachial plexus nor in the path of the nerves supposedly affected leads to diagnosis.

Resolution of the case on page 54.

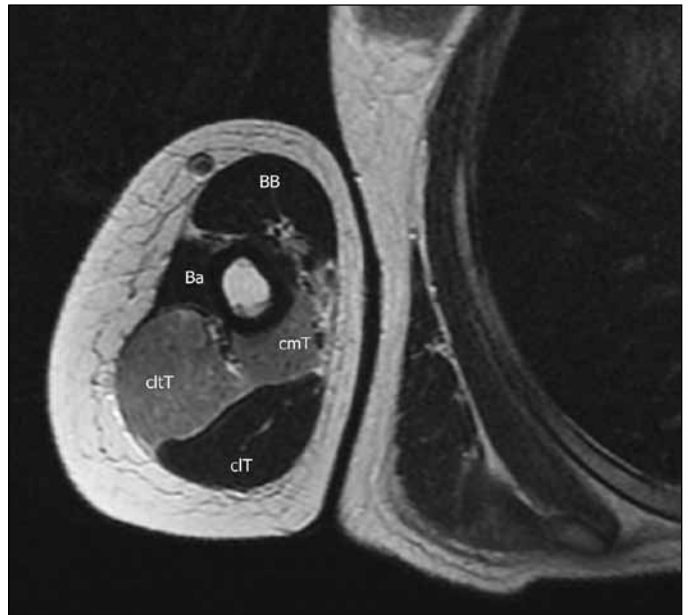


Figure 6. Arm's mid-third axial T2-weighted MRI (2320/86.3). That the radial nerve is compromised shows in the denervatory damage of the medial (Tmh) and lateral (Tlh) heads of the triceps muscle. Triceps' long head is undamaged, because it is usually innervated by the axilar nerve.

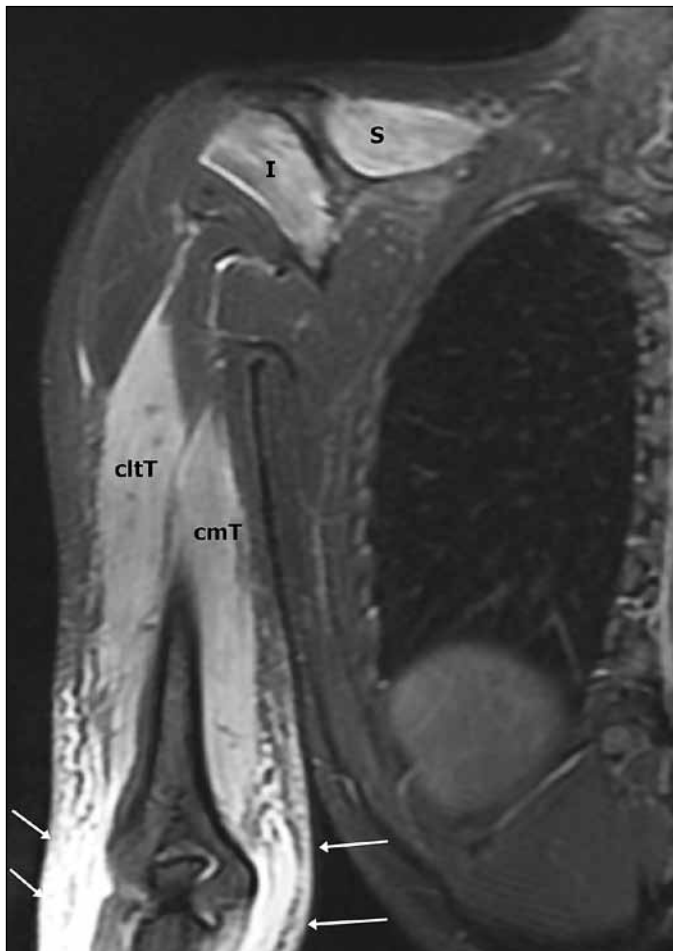


Figure 7. Right shoulder and arm coronal PD-weighted MRI sequence with fat suppression (3000/39.2). Denervatory damage in supraspinatus (S) and infraspinatus (I) muscles caused by the lesion of the suprascapularis nerve, and that of the medial (Tmh) and the lateral (Tlh) heads of the triceps muscle caused by the lesion of the radial nerve. Arrows show oedema and swelling in subcutaneous soft tissues in distal arm and elbow.