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EDİTÖRE MEKTUP / LETTER TO THE EDITOR

Shoulder injury related to rabies vaccine administration: a case report

Kuduz aşısı uygulamasına bağlı omuz yaralanması: bir olgu sunumu

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To the Editor,

Adverse reactions at vaccine injection sites are widespread, although the symptoms are generally mild and transient[1]. The most common findings are pain, swelling and redness at the injection site[2].Shoulder injury related to vaccine administration (SIRVA) has been defined as shoulder pain and limited range of motion in the shoulder after the administration of a vaccine into the upper arm,[1] and can be expected to become more common due to the increase in vaccination campaigns[3]. Although most cases are self-limiting, some people experience severe and persistent shoulder pain that requires treatment[3].

A 26-year-old female patient presented to our hospital for rabies vaccination after being scratched by a stray cat. The patient was scheduled for four doses of the rabies vaccine, but after the second dose the patient started to experience pain, mild swelling, redness and limited range of motion in her left arm. The pain had not dissipated one week after the second dose and increased with movement, limiting her daily activities, and so she presented to the physical therapy outpatient clinic. The patient had no history of disease or previous complaints of shoulder dysfunction. A physical examination revealed mild swelling, redness and generalized tenderness in the left upper arm at the level of the humeral head. Rotator cuff muscle strength and normal passive range of motion were preserved, but the active range of motion of the left shoulder was limited and painful. Shoulder impingement syndrome tests and Hawkins, Yergason, and Neer tests were positive. A shoulder magnetic resonance (MRI) examination performed approximately 1 month after the second dose vaccination revealed signal changes consistent with marked edema in the teres minor muscle, as well as focal bone marrow edema in the greater tuberculum at the teres minor tendon insertion level at the humeral head (Figure 1a, b). Effusion in the subdeltoid bursa, and an increased signal in the distal teres minor tendon and surrounding fluid were also noted (Figure 1c).

The patient was started initially on non-steroidal anti-inflammatory drugs, but a steroid injection was subsequently administered into the subdeltoid bursa under ultrasonography guidance after she described increased pain. Physical therapy consisting of superficial and deep warming and analgesic currents was applied to the shoulder area for two weeks, and shoulder joint range of motion and muscle strengthening exercises were prescribed. One month later, the patient's shoulder movements were painless at follow-up, shoulder impingement syndrome tests were negative and the patient reported reduced pain. The patient provided informed consent for this case report.

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In a patient with no previous history of chronic pain or inflammatory disease, the diagnosis of SIRVA is based on rapid-onset pain after intramuscular vaccine administration, consistent with a local immune-mediated inflammatory reaction in the affected shoulder[4]. Mild pain, erythema, inflammation and induration at the vaccination site are the most common local side effects.[2] Complaints affecting the shoulder due to vaccine injections are usually self-limiting and resolve within 24 to 48 hours,[5] while SIRVA, characterized by prolonged and debilitating shoulder pain, develops in very few cases[3]. For a diagnosis of SIRVA there should be no significant history of the shoulder before the injection, complaints should begin within 48 hours and there should be no response to analgesics[6].

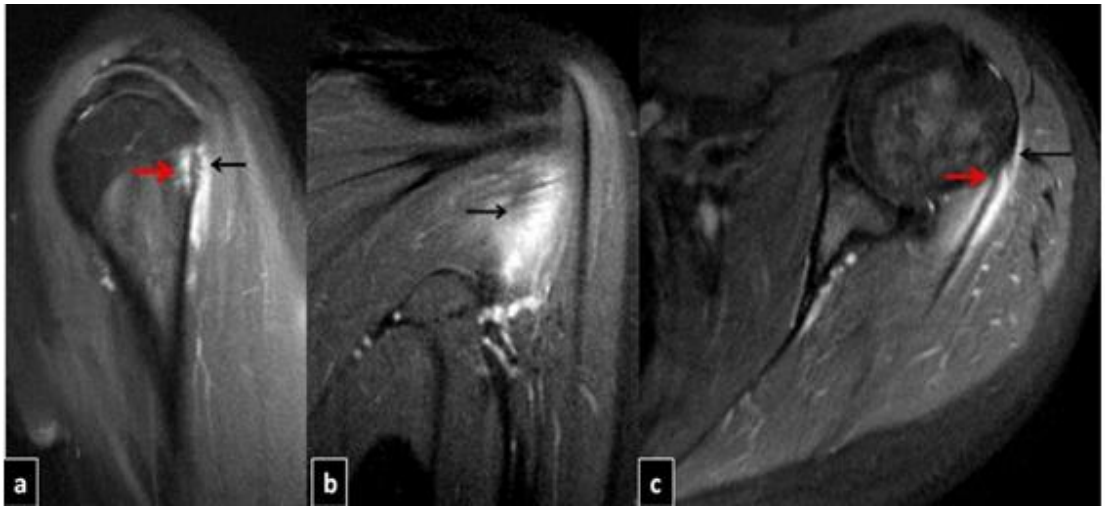

Figure 1.Fat-suppressed proton density-weighted MRI images of the patient presenting with persistent shoulder pain after the second dose of a rabies vaccine: (a) sagittal and (b) coronal images show and increased signal consistent with intense edema in the teres minor muscle (black arrow) and subchondral bone marrow edema in the tuberculum majus of the humeral head (red arrow), (c) axial image shows fluid in the subdeltoid bursa (black arrow) and increased signal in the distal teres minor tendon and surrounding effusion (red arrow).

Most cases of SIRVA are associated with needle misplacement and/or a local reaction to the serum administered during the vaccine administration[3]. The majority of reported SIRVA cases are women (71.1%) with a mean age of 53.6 (range: 22–89) years[7] The vaccines most frequently associated with SIRVA are influenza and pneumococcal vaccines, followed by diphtheria-tetanus-pertussis, diphtheria-tetanus toxoid, human papillomavirus and hepatitis A vaccines[3,8] although SIRVA has also been reported following COVID-19 vaccinations during the pandemic[3,6]

Shoulder injuries following vaccinations are injuries that are more severe than should be expected from a simple needle trauma[1]. The most common shoulder lesion is bursitis.[3] If the injection is made deep into the shoulder capsule, it can result in inflammation of the shoulder joint or bursal inflammation (synovitis) or infection (septic arthritis or bursitis); if into the rotator head, rotator cuff injury (tendinitis or rotator cuff rupture) can occur; and if into the subacromial or subdeltoid space, bursitis and/or adhesive capsulitis can develop[3].

Patients with SIRVA typically complain of shoulder pain, weakness in the shoulder, decreased range of motion, paresthesia and tingling in the vaccinated arm[3].Cases with shoulder pain lasting longer than 48 hours after vaccination and gradually worsening should be evaluated clinically[3].Radiography (x-ray) images can be easily obtained, but will often not be positive or diagnostic in the early period[9], and so the preferred imaging modality is MRI[9]. The most frequently reported MRI findings are increased fluid in the glenohumeral joint and subdeltoid/subacromial bursa, bone marrow edema, rotator cuff tear, a fluid signal in the bicipital groove

and biceps tendinitis[6]. In most injuries of this kind, no contrast material is used in the MRI evaluation[3], although MRI with contrast enhancement is recommended if infection is suspected. Furthermore, MRI can effectively show the extent of damage to the bone and the surrounding soft tissue[3].

There will likely be an increase in SIRVA cases with the increase in vaccination programs[3], and so the first approach should be to prevent SIRVA through the use of appropriate injection techniques, and proper syringe, needle thickness and needle length selection[3]. The leading cause of SIRVA is the injection being applied "too high" into the deltoid region[6]. The subacromial bursa may extend 3–6 cm distally from the acromion, and its distance from the skin is 0.8–1.6 cm. Injections into the upper 1/3 of the deltoid muscle may affect the subdeltoid/subacromial bursa, and so injections should not be made in this area[6]. Instead, the needle should be inserted into the thickest part of the deltoid muscle[3].

Shoulder injuries should be considered as one of the adverse effects of vaccination. To minimize the risk of post-vaccination shoulder complications, healthcare professionals should strictly adhere to the standards defined in intramuscular injection practice guidelines

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