

## Case Report

# Acute Shoulder Injury Following Tdap Vaccination: A Case Report on SIRVA and the Importance of Proper Injection Technique

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### Abstract

Shoulder Injury Related to Vaccine Administration (SIRVA) is a preventable iatrogenic condition caused by improper injection technique into the deltoid region. It can result in significant pain, inflammation, and impaired function. We report a case of a healthy adult female who developed acute shoulder pain and fatigue within hours of receiving an intramuscular tetanus toxoid vaccine. With no prior history of shoulder pathology, clinical evaluation supported a diagnosis of SIRVA. Conservative treatment with NSAIDs and physical therapy led to partial symptom relief, though some pain persisted a month later. This case highlights the importance of correct vaccination techniques and early recognition of SIRVA to mitigate its impact.

**Keywords:** SIRVA; Vaccine Complications; Subacromial Bursitis; Intramuscular Injection; Shoulder Pain; Vaccination Injury; Case Report.

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## Introduction

Intramuscular vaccine administration into the shoulder is commonly associated with localized pain that resolves within days. However, in rare instances, a more severe complication known as Shoulder Injury Related to Vaccine Administration (SIRVA) may occur, characterized by prolonged pain and limited mobility [1].

SIRVA is believed to result from improper injection into synovial tissues, such as the subdeltoid bursa or joint capsule, rather than the deltoid muscle [2]. While not specific to any one vaccine, cases have been reported following influenza, pneumococcal, COVID-19, HPV, and tetanus-containing vaccinations [3,4]. An increase in claims to the National Vaccine Injury Compensation Program (VICP) has drawn attention to this underrecognized condition [5].

Patients with low deltoid muscle mass, incorrect needle length, poor injection technique, or suboptimal patient positioning may be at greater risk [4]. We present a case of a woman who developed SIRVA following a Tdap vaccine.

## Case Presentation

A 51-year-old female health professional with no significant medical history sustained a minor kitchen injury to her finger on April 4, 2025. She received a Tdap vaccine in her left (non-dominant) shoulder at an urgent care facility by a standing nurse while seated. The injection at a dose of 0.5ml was administered into the upper outer portion of her deltoid muscle. As a healthcare professional, she noticed immediately that the vaccine injection was administered higher than expected.

Although she did not initially experience severe discomfort, by evening she developed progressive shoulder pain, reaching a severity of 8 out of 10 on the visual analog scale (VAS). The sharp, localized pain was aggravated by arm elevation and activities such as tying her hair. There were no systemic symptoms like fever or chills, and she did not experience numbness, tingling, or weakness. The contralateral arm was unaffected. She noted, "It hurt so bad that I couldn't move or lie on the left side." She also said she could barely sleep all night and awoke feeling fatigued and drained the next morning. She had no previous history of musculoskeletal or shoulder pathology and had tolerated previous vaccinations without incident.

Initial self-management included ibuprofen 200 mg and acetaminophen 1000 mg taken three times daily for several days, resulting in partial relief. She began light self-guided physical therapy, reporting gradual improvement. No imaging was obtained, citing lack of time, and surgical opinion was not sought. As of May 3, 2025, which was 29 days after the initial injection, she reported residual pain of 2/10 on the VAS but can perform moderate work duties.

## Physical Examination

At approximately four weeks post-vaccination, a clinical evaluation was performed. The pain persisted at 2/10, but both active and passive range of motion (ROM) were preserved fully.

She was able to raise both arms to shoulder height and overhead with proper form. She demonstrated full external and internal rotation, and a positive Apley Scratch test, indicating preserved shoulder mobility. No muscle atrophy or neurological deficits were identified. Sensation over the deltoid region was intact, and there was no cervical or thoracic spine involvement.

Laboratory work, including complete blood count, basic metabolic panel, and lipid profile, was unremarkable. Vitamin D was mildly low but not thought to be contributory.

## Treatment and Management

The diagnosis of SIRVA was made based on the temporal relationship between vaccine administration and the onset of symptoms, absence of prior shoulder issues, and clinical findings. She was advised to continue conservative treatment, including physical therapy and as-needed NSAIDs. Should symptoms persist, she may require further evaluation by the orthopaedic surgeons. Adverse events were reported to the Vaccine Adverse Event Reporting System (VAERS), and the patient was counselled on the expected recovery course.

## Discussion

Since the widespread administration of COVID-19 vaccines, SIRVA has received increased attention, although it remains relatively rare. It typically presents as shoulder pain and reduced function within 48 hours of vaccination [2]. In this case, symptoms began within hours of Tdap administration, in the absence of other etiologies, supporting a diagnosis of SIRVA.

The proposed mechanism involves the accidental injection of vaccine contents into synovial tissues, which can provoke an inflammatory response in structures such as the subacromial bursa or rotator cuff tendons [2,4]. Poor technique, including injecting too high on the shoulder or using an inappropriate needle length, increases this risk, other known risk factors in the adult population such as female sex, advanced age, an increased number of outpatient visits in the 6 months before vaccination, lower Charlson Comorbidity Index, and pneumococcal conjugate vaccine have also been documented [6]. Furthermore, a previous history of adhesive capsulitis which is a global restriction in the ROM in both active and passive movement in at least 2 planes puts a patient at an increased risk for the development of SIRVA [7], while this is true, several other studies have shown that there were little to no known risk factors prior to its development [8,9,10]. Therefore, it is important to note that SIRVA can occur just from improper mechanism of administration without any prior underlying or predisposing conditions but can occur more frequently if you are female at an advanced age like the index case.

Management typically begins with NSAIDs, corticosteroid injections, and physical therapy. In refractory cases, surgical interventions such as bursectomy or arthroscopic debridement may be required [3,4]. Our patient has improved with conservative treatment but continued to experience mild discomfort.

Importantly, this case illustrates that SIRVA may be preventable. Education on proper injection techniques include avoiding the upper third of the deltoid, selecting the appropriate needle based on body habitus, and ensuring proper patient positioning—is critical. For example, the injection should be given approximately 2–3 fingerbreadths (about 5 cm) below the acromion to avoid shoulder capsule structures. There have been several documented evidence of improper administration of vaccines without any underlying risk factors, resulting in the development of SIRVA [8,9,10] which lends credence to this theory. Consequently, this condition may have been prevented even in an advanced female patient just by adopting proper administration techniques that avoid capsular structures.

Healthcare providers should continue to maintain a high index of suspicion when evaluating post-vaccination shoulder pain. Early diagnosis can guide management and may improve outcomes. Timely reporting to VAERS is also encouraged to monitor trends and improve safety practices.

## Conclusion

This case underscores the importance of proper vaccine administration to prevent SIRVA, a painful and potentially disabling condition. Though rare, SIRVA can have lasting impacts on function and quality of life. Early recognition, appropriate treatment, and clinician awareness are crucial to minimizing its burden. Training healthcare professionals in proper intramuscular injection techniques and reporting vaccine-related injuries are essential steps toward reducing the incidence and preserving public confidence in vaccination programs.

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