

A Rare Case of Abscess and Axillary Neuropathy Following Anti-rabies Vaccination in a 10-year-old Child: A Case Report and Literature Review

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Learning Point of the Article:

We report the first ever documented case of abscess formation following administration of the purified Vero cell rabies vaccine (PVRV). Clinicians should remain vigilant for even unreported adverse reactions as timely recognition and intervention can lead to a favorable outcome.

Abstract

Introduction: Post-exposure prophylaxis for rabies is generally considered safe, with serious adverse events being exceedingly rare. Although abscess formation is plausible but to date, there is no documentation of abscess formation after purified Vero cell rabies vaccine (PVRV).

Case Report: This report presents a rare and first-reported case of localized abscess and axillary neuropathy following intradermal administration of PVRV in a pediatric patient. The child developed pain, swelling, and localized infection after the final vaccine dose, progressing to shoulder weakness due to axillary nerve involvement. Incision and drainage for the abscess and conservative management for axillary neuropathy resulted in full recovery.

Conclusion: The case highlights the need for vigilance in identifying and managing rare vaccine-associated adverse events.

Keywords: Rabies, purified Vero cell rabies vaccine, axillary neuropathy, adverse vaccine reaction, post-exposure prophylaxis.

Introduction

Post-exposure prophylaxis (PEP) for rabies using purified Vero cell rabies vaccine (PVRV) is recommended by the World Health Organization (WHO) and is considered safe with few reported adverse effects [1]. The most common adverse events reported after PVRV are pruritic, headache, fever, and myalgia and local reactions with redness and pain at injection sites [2, 3, 4, 5]. Over the years, PVRV have demonstrated a strong safety profile, with abscess formation at the injection site being a very rare adverse event. After a thorough and meticulous literature search, the authors found out that although local reactions are common, abscess formation has not been previously documented with PVRV [2, 3, 4, 5]. Here, we are presenting the first case where,

after PVRV, the patient not only developed an abscess in the arm but also developed axillary neuropathy.

Case Report

A 10-year-old previously healthy male presented to the orthopedics outpatient department with complaints of the left shoulder weakness and restricted range of motion. One month earlier, he sustained a WHO category 2 dog bite on the left calf while playing; following which he received wound care and PEP at a local primary health center [6]. His vaccination schedule included three intradermal doses of PVRV (Fig. 1 and 2) administered on days 0, 3, and 7. The first and last doses were administered in the left deltoid, while the second dose was given

Author's Photo Gallery



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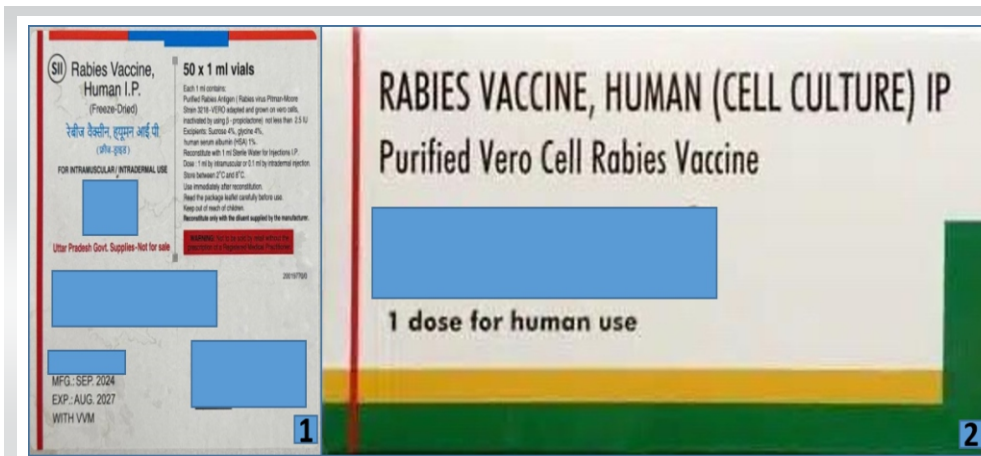


Figure 1 and 2: Purified Vero cell rabies vaccine.

motion. By the final follow-up, the patient had regained full deltoid power and shoulder mobility, with complete resolution of sensory deficits (Fig. 5 and 6).

Discussion

An extensive search of the literature on PubMed and Google Scholar was performed. The Mesh terms rabies, PVRV, abscess, complications, adverse vaccine reactions, were searched, and it was found that there were no article which has reported even a single case of abscess formation after

in the right deltoid.

The child remained asymptomatic for the first 3 days after the final injection, after which he developed localized pain, redness, and swelling at the injection site, accompanied by low-grade fever. The pain was gradually progressive and throbbing in nature, worsened by shoulder movements. Subsequently, his parents noted progressive weakness, particularly affecting shoulder abduction and flexion. A clinical diagnosis of abscess formation was made at a nearby facility, where incision and drainage were performed. Despite wound healing over the following 15 days with conservative dressing, shoulder weakness persisted, prompting referral to our center.

On examination, a linear scar of approximately 1 cm was noted over the anterolateral aspect of the left shoulder, suggesting prior surgical intervention (Fig. 3). There was visible muscle wasting over the left deltoid region. The patient exhibited a complete loss of active shoulder abduction and flexion, with preserved elbow and wrist range of motion. Neurological examination revealed 0/5 power in the deltoid muscle and sensory loss in the regimental badge area, suggestive of axillary nerve involvement. Strength in other muscle groups of the upper limb was intact, with normal deep tendon reflexes. Cranial nerve and contralateral limb examinations were unremarkable.

Electrodiagnostic studies showed reduced compound muscle action potential amplitude in the left axillary nerve (4.6 mV vs. 11.6 mV on the right) and prolonged duration (9.06 ms vs. 6.16 ms). Latency values were comparable bilaterally. These findings confirmed the diagnosis of the left axillary neuropathy (Table 1 and Fig. 4).

The patient was managed conservatively with physiotherapy focused on deltoid muscle strengthening and shoulder mobilization. Serial follow-up assessments over 4 weeks revealed gradual improvement in muscle strength and range of

PVRV vaccination. This case report appears to be the first documentation of abscess formation after PVRV.

All intradermal and intramuscular injections do have a potential risk of infection and abscess formation. Not following proper technique and aseptic precautions, immunogenicity of the vaccine, etc., can be quoted as the probable causes. However, the rate of infection resulting from vaccine administration is surprisingly lower. For instance, the vaccine injection-related abscess formation has been reported in <1% of intradermal *Bacillus Calmette–Guérin* vaccines [7]. Similarly, Burton et al., reported abscess formation in only 41 cases out of 100,000



Figure 3: Healed scar mark of around one cm over anterolateral aspect of the left shoulder.

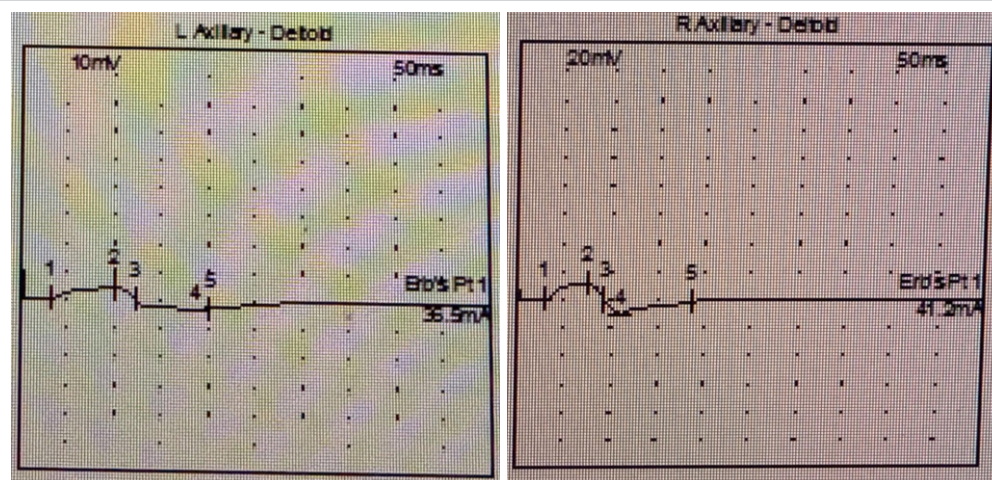


Figure 4: Comparison of action potential left and right axillary nerve.

pneumococcal vaccine injections [8]. The occurrence of abscess formation with rabies vaccines is less common. There has not been a single-documented evidence of abscess formation after PVRV rabies vaccination.

In a randomized, blinded, parallel-controlled phase III clinical study, Huang et al., reported that the occurrence of systemic fever and local pain was the most common adverse reactions. However, most reactions were mild to moderate in severity and transient [9]. Similar results were also found in the studies done by Zhang et al., and Hu et al. [10, 11]. Most of the reactions occurred at early doses, especially the first dose, and their incidence decreased in subsequent dosage [9].

Although PVRV is generally considered safer than older neural tissue-based vaccines but still, it is still associated with rare neurological complications. These complications are primarily immune-mediated and can manifest in various forms. The most

common neurological complications reported include optic neuritis and Guillain-Barre syndrome. These complications result from immune responses triggered by the vaccine, which lead to inflammation and demyelination of neural tissues [5, 12, 13].

In a study done by Ali et al., PVRV was shown to be generally safe. However, few neurological manifestations, such as dizziness, paresthesia, and transient headache, were reported, but there were no cases with long-term sequelae or mortality [14].

The cause of axillary nerve injury in this case can be debated. The two most probable reasons are the inflammation (Neuritis) of the axillary nerve and injury during surgical drainage of the abscess. As the incision is located anterolateral, the axillary nerve, even if it got lacerated at this location, would not lead to the weakness of abduction and extension of shoulder as most of the abductor and extensor segment of the deltoid already gets the nerve supply proximal to the point of laceration. According to the history given by the child's parents, the axillary nerve palsy developed after abscess formation and before the surgical procedure. The most probable reason might have been the brachial neuritis due to inflammation or pressure-related changes rather than direct vaccine-induced neuropathy. Usually, the brachial neuritis has a shorter healing time and has more successful outcomes as compared to other axillary nerve



Figure 5 and 6: Patient at final follow-up with fully regained deltoid power and shoulder mobility.

Table 1: Nerve conduction study showing reduced amplitude on left axillary nerve.

Nerve / Sites	Muscle	Latency (ms)	Amplitude (mV)	Amp %	Duration (ms)	Amp 2-4 %
L Axillary - Deltoid						
Erb's Pt	Deltoid	3.28	4.6	100	9.06	100
R Axillary - Deltoid						
Erb's Pt	Deltoid	3.02	11.6	100	6.25	100

injuries [15]. In cases of axillary nerve injury, return of the functions usually takes around 3–12 months [16]. Complete recovery of axillary nerve in just 6–8 weeks suggests the diagnosis of neuritis instead of laceration of axillary nerve.

Axillary nerve injury is not very common in children, and to manage it, a trial of conservative management is given [17]. Usually, most of the injuries recover spontaneously. Surgical management should be reserved for the patients who do not show the signs of improvement in 4–6 months [16, 17, 18].

Conclusion

Although biologically plausible, abscess formation following PVRV remains exceedingly rare. Prompt recognition and supportive management can ensure full recovery. Vigilance during administration and monitoring for adverse events remains essential in pediatric vaccination protocols. This case report underscores the importance of recognizing uncommon complications of commonly administered vaccines.

Clinical Message

Physicians should be prepared even for extremely uncommon complications such as abscess formation after purified chick embryo cells, as prompt diagnosis and treatment leads to a favorable outcome.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Conflict of interest: Nil **Source of support:** None

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Consent: The authors confirm that informed consent was obtained from the patient for publication of this case report

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