

Parsonage-Turner syndrome after SARS-CoV-2 vaccination: A case report

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ABSTRACT

Parsonage-Turner syndrome is a neurological disease characterized by pain, muscle weakness, sensory deficits, and reflex abnormalities. Although its exact etiology is unknown, it can be observed after infection, surgery, trauma, and vaccination. This syndrome, which can occur after various vaccines, has been reported in a few cases worldwide after severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) vaccination. In this case report, Parsonage-Turner syndrome developed after the SARS-CoV-2 BioNTech vaccination in a 56-year-old male patient. To the best of our knowledge, this is the first case reported in Türkiye.

Keywords: Brachial plexus neuritis, Parsonage-Turner syndrome, SARS-CoV-2, shoulder pain, muscle weakness, vaccination.

Parsonage-Turner syndrome (PTS), also called idiopathic brachial plexopathy, brachial neuritis, or neuralgic amyotrophy, usually causes unilateral sudden-onset shoulder pain, neurological motor weakness, and dysesthesia.^[1] Pain typically resolves within one or two weeks, whereas recovery from muscle weakness may take several months to several years.^[2] Although the exact etiology and pathophysiology of PTS are unknown, it has been reported to occur after trauma, surgery, infection, or vaccination.^[3]

Various vaccines have been developed and administered in the world and our country to prevent the emerging severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic. In large-scale controlled studies for these vaccines, it has been reported that postvaccination side effects, such as pain at the injection site, headache, and fatigue, are common, whereas neurological complications are rare. Brachial plexopathy after the SARS-CoV-2 vaccine has been reported in a few cases worldwide, but it has not yet been reported in our country.^[4-6] In this

case report, the first reported PTS case in Türkiye after the SARS-CoV-2 Pfizer/BioNTech (BNT162b2) vaccination is discussed.

CASE REPORT

A 56-year-old male patient presented to the clinic with left shoulder pain and muscle weakness within 24 h of the second dose of the SARS-CoV-2 BioNTech vaccine injected into the left deltoid muscle. The patient did not describe numbness or sensory deficits. Physical examination revealed no swelling or redness at the injection site; however, warmth was observed in the deltoid area. The patient's left shoulder pain Visual Analog Scale score was 7. The active range of motion (ROM) of the left shoulder was 30° in abduction, flexion, and extension, whereas there were no limitations in passive ROM. No abnormalities were detected in the elbow, wrist, or hand finger joint examinations. In the manual muscle power test, shoulder flexion, abduction, and extension were 2/5, elbow flexion

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was 4/5, and the other upper extremity muscles were 5/5. Sensory and reflex examinations were normal. Laboratory tests, such as C-reactive protein, erythrocyte sedimentation rate, hemogram, biochemical tests, and troponin, were normal.

Cervical spine magnetic resonance imaging (MRI) and left shoulder MRI did not reveal any findings that explained the patient's symptoms. In

the short tau inversion recovery sequence of the brachial plexus MRI, increased signal intensity was detected in the nerve root originating from the left C5-C6 level compared to the other roots (Figure 1). In the electromyography (EMG), in which the left axillary and musculocutaneous (C5-C6) nerves were stimulated, motor responses were obtained with low amplitude (Table 1).

TABLE 1
Electromyography and nerve conduction velocity test results

TABLE 1 Electromyography and nerve conduction velocity test results											
Motor conduction velocity											
Recording	Nerve	Level	Stimulus point	LatOn (ms)	B-P Amp (mV)	Distance (mm)	Vel (m/s)				
Left											
APB	Median	C6-T1	Wrist	3	10.8	250	59.5				
			Elbow	7.2	10.7						
ADM	Ulnar	C8-T1	Wrist	2.75	11.8	290	52.3				
			Elbow	8.3	11.8						
Deltoid	Axillary	C5-C6	Erb's point	4.5	2.06						
Biceps brachi	Muscn	C5-C6	Erb's point	4.55	2.32						
Sensory conduction velocity											
Recording	Nerve	LatOn (ms)		Amplitude (uV)		Distance (mm)	Vel (m/s)				
Left											
Digit 1	Median	2		49.3		110	55				
Digit 3	Median	2.4		61.1		130	54.2				
Digit 5	Ulnar	2.4		49.8		110	45.8				
Needle EMG											
Muscle	Nerve	Root	Ins Act	Spontan Activity				MUAP			Rec
				PSW	Fibs	Fasc	HF	Dur	Phase	Amp	
Left											
Deltoid-posterior	Axillary	C5-6	+	++	++	-	-	Inc	P	NR	-2-3
Biceps brachii	Muscn	C5-6	+	++	++	-	-	Inc	P	NR	-2-3
Brachioradialis	Radial	C5-6	+	++	++	-	-	Inc	P	NR	-2-3
Triceps-long head	Radial	C7-8	N	-	-	-	-	N	N	N	N
Ext digit com	PIN	C7-8	N	-	-	-	-	N	N	N	N
Dors Int 1	Ulnar	C8-T1	N	-	-	-	-	N	N	N	N
Right											
Deltoid-posterior	Axillary	C5-6	N	-	-	-	-	N	N	N	N
Biceps brachii	Muscn	C5-6	N	-	-	-	-	N	N	N	N
Triceps-long head	Radial	C7-8	N	-	-	-	-	N	N	N	N
Ext digit com	PIN	C7-8	N	-	-	-	-	N	N	N	N
Dors Int 1	Ulnar	C8-T1	N	-	-	-	-	N	N	N	N
LatOn: Onset latency; B-P Amp: Baseline-peak amplitude; Vel: Velocity; APB: Abductor pollicis brevis; ADM: Abductor digiti minimi; EMG: Electromyography; Ins Act: Insertional activity; MUAP: Motor unit action potential; Rec: Recruitment; PSW: Positive sharp wave; Fibs: Fibrillation; Fasc: Fasciculation; HF: High frequency; Dur: Duration; Inc: Increased; P: Polyphaser; NR: Neuropathic response; Muscn: Musculocutaneous; N: Normal; Ext digit com: Extensor digiti communis; Dors Int 1: First dorsal interosseus; PIN: Posterior interosseal nerve.											



Figure 1. Increased signal intensity in the left C5 nerve in brachial plexus magnetic resonance imaging short tau inversion recovery sequence (indicated by arrow).

The results of the MRI and EMG tests revealed left upper trunk brachial plexopathy, which was diagnosed as Parsonage-Turner syndrome. A nonsteroid anti-inflammatory drug (acetaminophen 60 mg 2×1) was given to the patient. A 30-session physiotherapy program, including transcutaneous electrical nerve stimulation, therapeutic electrical stimulation, shoulder joint ROM, and a rotator cuff muscle strengthening program, was planned.

There was no pain or limitation in abduction, flexion, or extension in active or passive ROM of the left shoulder. In the manual muscle power test, shoulder flexion, abduction, and extension were 4/5, and elbow flexion was 5/5. The patient's left shoulder pain visual analog scale score was 0 in the three-month follow-up.

DISCUSSION

Parsonage-Turner syndrome is a peripheral neuropathy that manifests as sudden-onset, severe upper arm pain and muscle weakness. Parsonage-Turner syndrome has been described

as a rare disease in many studies. However, a recent study reported that this syndrome is frequently overlooked and misdiagnosed due to the difficulty of diagnosing at an early stage; in fact, the reported annual incidence is 1 in 1,000.^[7] Although infections, surgery, trauma, autoimmune and connective tissue diseases, and vaccines are involved in its etiology, the exact mechanism of this disease is not known. However, it is thought to be triggered by autoimmune inflammatory events. In the case reported here, PTS developed within 24 h after the SARS-CoV-2 Pfizer-BioNTech (BNT162b2) vaccination.

After vaccination, the symptoms of PTS may appear within a few weeks or, as described in the presented case, in as little as 24 h.^[5] Various symptoms, such as pain, muscle weakness, sensory deficits, and reflex abnormalities, can occur in this syndrome, and pain and muscle weakness were prominent in this case. Although PTS is mainly a clinical diagnosis, EMG and MRI findings are important to support the diagnosis. There is no specific treatment for the disease, but oral steroids, nonsteroid anti-inflammatory drugs, physical therapy modalities, and physiotherapy programs can be conservatively applied.^[2] The pain decreases in a short time with recovery, whereas the improvement of muscle weakness may take up to two to three years.^[8] In the present case, pain and elbow muscle strength improved at the three-month control and shoulder muscle tone increased significantly, but it did not reach the maximum strength level.

In conclusion, although vaccination is a known cause of Parsonage-Turner syndrome, this syndrome has only been reported in a few cases worldwide after the SARS-CoV-2 vaccination. To the best of our knowledge, this case is the first PTS case in Türkiye after the SARS-CoV-2 vaccination. It is thought that the number of PTS cases will increase with the continuation of the SARS-CoV-2 pandemic and associated vaccinations.

Patient Consent for Publication: A written informed consent was obtained from patient.

Data Sharing Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

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