Case Report

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

Adil Öncel, Evrim Coskun

Department of Physical Medicine and Rehabilitation, Başakşehir Cam and Sakura City Hospital, Istanbul, Türkiye

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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.

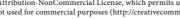
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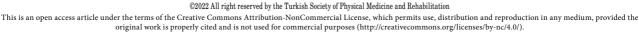
A 56-year-old male patient presented to the clinic with left shoulder pain and muscle weakness within 24 h of the second dose of the SARS-CoV-2 BioNTech vaccine injected into the left deltoid muscle. The patient did not describe numbness or sensory deficits. Physical examination revealed no swelling 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

Corresponding author: Adil Öncel, MD. Basaksehir Cam ve Sakura Sehir Hastanesi, Fiziksel Tip ve Rehabilitasvon Kliniği, 34480 Basaksehir, İstanbul, Türkive. e-mail: oncel@hotmail.com

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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).

| | | | | TABLI | E 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 Elbow | | 3 7.2 | | 10.8 10.7 | | 250 59. | | |
| ADM | Ulnar | C8-T1 | Wrist Elbow | | 2.75 8.3 | | 11.8 11.8 | | | | 52.3 | |
| Deltoid | Axillary | C5-C6 | Erb | Erb's point | | 4.5 | | 2.06 | | | | |
| Biceps brachi | Muscn | C5-C6 | Erb | Erb's point | | 4.55 | | 2.32 | | | | |
| | Sensory conduction velocity | | | | | | | | | | | |
| Recording | Nerve | LatOn (ms) | | | Amplitude (uV) | | Distance (r | | nm) |) 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 | Nerve Root | | | 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 interossei; PIN: Posterior interosseal nerve.

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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 (acemetacine 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.

Author Contributions: Concept, resources, materials, data collection and processing, analysis and interpretation, literature search, writing manuscript: A.Ö.; Design, supervision, critical review: E.C.

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REFERENCES

- Tjoumakaris FP, Anakwenze OA, Kancherla V, Pulos N. Neuralgic amyotrophy (Parsonage-Turner syndrome). J Am Acad Orthop Surg 2012;20:443-9.
- Kim JG, Kim SY, Oh HS, Jo DH. Parsonage-Turner syndrome following typhoid vaccination. Yonsei Med J 2021;62:868-71.
- Feinberg JH, Radecki J. Parsonage-turner syndrome. HSS J 2010;6:199-205.

- Mahajan S, Zhang F, Mahajan A, Zimnowodzki S. Parsonage Turner syndrome after COVID-19 vaccination. Muscle Nerve 2021;64:E3-E4.
- 5. Queler SC, Towbin AJ, Milani C, Whang J, Sneag DB. Parsonage-Turner syndrome following COVID-19 vaccination: MR neurography. Radiology 2022;302:84-7.
- 6. Coffman JR, Randolph AC, Somerson JS. Parsonage-Turner syndrome after SARS-CoV-2 BNT162b2 vaccine: A case report. JBJS Case Connect 2021;11: e21.00370.
- 7. van Alfen N, van Eijk JJ, Ennik T, Flynn SO, Nobacht IE, Groothuis JT, et al. Incidence of neuralgic amyotrophy (Parsonage Turner syndrome) in a primary care setting--a prospective cohort study. PLoS One 2015;10:e0128361.
- 8. Mitry MA, Collins LK, Kazam JJ, Kaicker S, Kovanlikaya A. Parsonage-Turner syndrome associated with SARS-CoV2 (COVID-19) infection. Clin Imaging 2021;72:8-10.