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Case report: Median Nerve Damage After Subcutaneous Methotrexate Injection in a Patient with Rheumatoid Arthritis

Rekib Sacaklidir

Sisli Hamidiye Etfal Training and Research Hospital, Department of Physical Medicine and Rehabilitation, Pain Management Section, Istanbul, Turkey

Corresponding Author:** ***Rekib Sacaklidir, *Sisli Hamidiye Etfal Training and Research Hospital, Department of Physical Medicine and Rehabilitation, Pain Management Section, Istanbul, Turkey*

Abstract

Methotrexate is an indispensable drug in the treatment of rheumatoid arthritis. A 70-year-old female patient complained of left extremity weakness and pain after the methotrexate injection. In the clinical examination of the patient, there was difficulty in pronation and in closing her hand. In the electromyography, the left median nerve sensory and motor fibers were affected above the elbow. The patient was included in the rehabilitation program, and pregabalin was started for neuropathic pain. At the 3rd month follow-up, it was determined that the patient's motor functions had improved and his pain had significantly decreased. Methotrexate is necessary to be careful in terms of nerve damage during upper arm subcutaneous injections in underweight and elderly patients.

Keywords: *Median nerve, median neuropathy, injections, rheumatoid arthritis*

1. Introduction

Injection nerve palsy (INP) accounts for 2% of all nerve damage. It usually begins suddenly after the injection and is characterised by pain along the nerve distribution. Although it usually appears in the lower extremity, INP is also seen in the upper extremity, and the median nerve is often involved (1). Median nerve damage usually develops secondary to entrapment neuropathies. Compression or damage is usually observed at the carpal tunnel level (2). The INP can develop secondary to direct nerve damage by needle or caused by the chemical agent. The extent of nerve damage also varies, depending on its proximity to the relevant nerve tissue. It has also been stated that nerve diameter is important in terms of nerve damage. Drugs such as penicillin, diazepam, chlorpromazine, dimenhydrinate, tetanus toxoid, procaine, and hydrocortisone have been shown to be toxic to nerve tissue (1).

There are some cases of median nerve INP in the literature (2-4). Kim et al. presented a case of median nerve injury following a carpal tunnel steroid injection (3). Fremling et al. presented a case in which the median nerve INP developed after local anesthetic (lidocaine) injection into the upper arm (4). In another case report of a patient who underwent venipuncture, median nerve INP due to hematoma was observed (5, 6). However, no INP has been described following methotrexate injection. The aim in this case is to show that subcutaneous methotrexate injection may cause median nerve neuropathy and to inform our colleagues about possible results.

2. Case Report

This study conforms to all CARE guidelines and reports the required information accordingly (see Supplementary Checklist, https://lww.figshare.com/s/3fd0cf8b419d4bb7ef7c). Informed consent was obtained from the patient. A 70-year-old female patient, who was followed up for a long time for rheumatoid arthritis, was using oral mtx, while the treatment was converted to a subcutaneous route. The patient presented to us with complaints of left arm weakness and pain after the mtx injection at the upper arm. In the clinical examination of the patient, there was difficulty in pronation and in closing her hand.

The patient had neuropathic pain along the median nerve distribution. Since the complaints started immediately after the injection and there was no other explanatory reason,

electromyography and nerve conduction studies (EMG) were requested. In the EMG of the patient, it was found that the left median nerve was compatible with partial axonal neuropathy, in which the sensory and motor fibers were affected above the elbow. The patient was included in the rehabilitation program, and pregabalin 2*150 mg was started for neuropathic pain. At the 3rd month follow-up, it was determined that the patient's motor functions had improved and his pain had significantly decreased. Also, significant re-innervation was detected in the patient's 3rd month control EMG.

3. Discussion

Although injection neuropathies mostly appear in the lower extremities, they cause distressing situations when they also appear in the upper extremities. In the present case, we wanted to state that median nerve damage may occur after subcutaneous methotrexate injection. Upper extremity INP usually develops due to carpal tunnel injection. It is stated here that nerve damage may be due directly to the needle or secondary to the methylprednisolone or bupivacaine used (1). Linskey and Segal reviewed older studies to determine the cause of the patient's INP and stated that injecting steroids alone could be the cause of nerve damage.

Additionally, granuloma formation in the median nerve after injection is noteworthy (7).Proximal median nerve injection neuropathy is very rare in the literature. In a case with an abscess on the arm, the patient was administered local anesthesia with lidocaine before abscess drainage, but numbness and loss of motor function developed along the median nerve immediately after local anesthesia. However, in this case, it was not defined whether the damage was caused by lidocaine or by direct needle damage (4).

The INP related to mtx injection is not found in the literature. However, methotrexate is a folate antagonist that inhibits dihydrofolate reductase, and it is used in rheumatic diseases and cancer patients. It may cause peripheral neuropathy (8). In the present case, the fact that the patient was elderly and underweight may have caused direct damage to the median nerve by the needle.

However, due to the nature of mtx being a neurotoxic agent, we think that INP occurs due to the administered agent rather than direct needle damage. Contrary to our belief, a study conducted with rats showed that low-dose methotrexate was administered systemically to reduce peripheral nerve damage (9) . However, we do not know whether this study has any clinical implications. Additionally, we cannot predict what will happen after the drug comes into direct contact with nerve tissue.

Methotrexate is a drug frequently used in the treatment of rheumatoid arthritis, and it is necessary to be careful in terms of nerve damage during subcutaneous administration in underweight and elderly patients.

References

[1] Andrea A, Gonzales JR, Iwanaga J, Oskouian RJ, Tubbs RS. Median nerve palsies due to injections: a review. Cureus 2017; 9.

[2] Dydyk AM, Negrete G, Sarwan G, Cascella M. Median Nerve Injury. In: StatPearls. Treasure Island (FL) ineligible companies. Disclosure: Guillermo Negrete declares no relevant financial relationships with ineligible companies. Disclosure: Gurpreet Sarwan declares no relevant financial relationships with ineligible companies. Disclosure: Marco Cascella declares no relevant financial relationships with ineligible companies.: StatPearls Publishing Copyright © 2024, StatPearls Publishing LLC.

[3] Kim HJ, Park SH. Median nerve injuries caused by carpal tunnel injections. Korean J Pain 2014; 27: 112-7.

[4] Fremling MA, Mackinnon SE. Injection injury to the median nerve. Ann Plast Surg 1996; 37: 561-7.

[5] Kim HJ, Park SK, Park SH. Upper limb nerve injuries caused by intramuscular injection or routine venipuncture. Anesth Pain Med 2017; 12: 103-10.

[6] Yalcin E, Onder B, Kurtaran A, Yildirim O, Akyuz M. Electrophysiological and ultrasonographic evaluation of median nerve injury after brachial arter cannulation/Brakial arter kanulasyonu sonrasi gelisen yuksek median sinir lezyonunun elektrofizyolojik ve ultrasonografik degerlendirmesi. Turkish Journal of Physical Medicine and Rehabilitation 2012; 58: 165-8.

[7] Kim HJ, Park SH. Median nerve injuries caused by carpal tunnel injections. The Korean journal of pain 2014; 27: 112.

[8] Vilholm OJ, Christensen AA, Zedan AH, Itani M. Drug-induced peripheral neuropathy. Basic & clinical pharmacology & toxicology 2014; 115: 185-92.

[9] Scholz J, Abele A, Marian C, Häussler A, Herbert TA, Woolf CJ, et al. Low-dose methotrexate reduces peripheral nerve injury-evoked spinal microglial activation and neuropathic pain behavior in rats. Pain 2008; 138: 130-42.

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