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Case report | Prikaz bolesnika

A case report of transverse myelitis in a young man with neurosyphilis

Transverzalni mijelitis u mladog muškarca s neurosifilisom: prikaz bolesnika

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Abstract

Transverse myelitis is an unusual complication of neurosyphilis. As rare diseases reveal the extraordinary, we present here, a rare case of a young patient with lower limb paresis and difficulty urinating. Neurosyphilis was diagnosed and treatment with penicillin G, corticosteroids and intensive physiotherapy, resulted to significant improvement.

Sažetak

Transverzalni mijelitis je neuobičajena komplikacija neurosifilisa. Budući da rijetke bolesti često otkrivaju neobične kliničke prezentacije, prikazujemo rijedak slučaj mladog bolesnika s parezom donjih ekstremiteta i poteškoćama pri mokrenju. Dijagnosticiran je neurosifilis, a liječenje penicilinom G, kortikosteroidima i intenzivnom fizioterapijom dovelo je do značajnog kliničkog poboljšanja.

Introduction

Syphilis, caused by the spirochete *Treponema pallidum*[1], can progress through distinct clinical stages, with neurosyphilis occurring when the central nervous system becomes involved. Neurosyphilis, a severe complication of untreated or inadequately treated syphilis, remains a significant public health concern, particularly within populations at higher risk for sexually transmitted infections (STIs). Despite advancements in diagnostic and therapeutic strategies, the resurgence of syphilis in recent decades has been noted, especially among men who have sex with men (MSM) [2]. Due to this trend, early recognition and treatment are of utmost importance to avoid life-threatening conditions such as neurosyphilis.

This case report focuses on the clinical case of a young male patient, presenting with neurosyphilis. Through this case, we explore the diagnostic challenges, clinical presentation, and therapeutic approach associated with this condition. By contextualizing this case within the broader epidemiological and clinical landscape of syphilis, this paper aims to enhance awareness among clinicians and contribute to improved patient care and outcomes.

Case Presentation

A young, 32-year-old male patient, reported as MSM, with an unremarkable past medical history, presented to the emergency department. This was his third visit after reporting a fall from his own height while descending stairs. Two previous visits to the emergency department were recorded, one for the same reason and the second due to urinary retention. During the third visit, the patient reported difficulty walking due to weakness in the lower limbs, with numbness and hypoesthesia, as well as difficulty urinating. He did not report fever or any other symptoms.

During neurological examination, the patient demonstrated good communication skills, with no disorientation or confusion. There was paresis of the lower limbs graded 2/5 bilaterally, along with reduced superficial and deep sensation below the level of T1. The patient displayed negative Barre and Migazzini signs bilaterally. The plantar reflexes were normal bilaterally. The tendon reflexes in the lower extremities were normal as well. The cranial nerves were intact. There were no meningeal signs or cervical stiffness. The pupils were equal in size, and the photomotor reflex was normal bilaterally. During the rest of the clinical examination, there was dullness above the pubic area upon percussion. A urinary catheter was placed, and 1L of urine was drained.

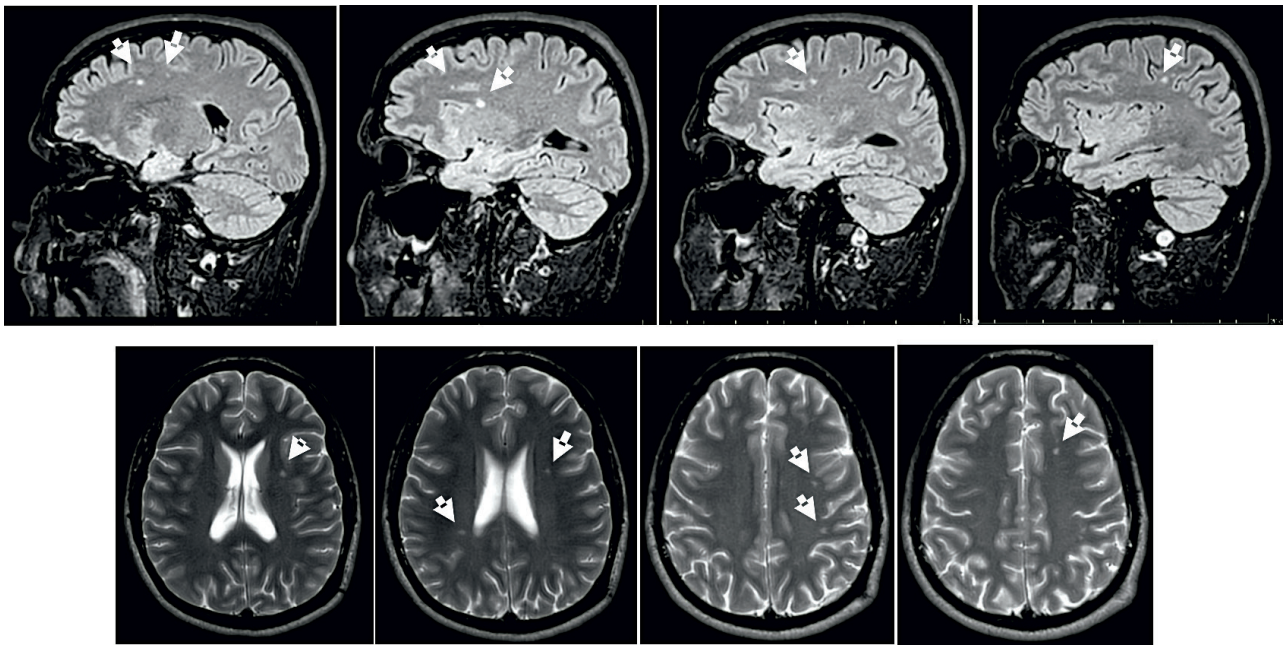
The laboratory tests were remarkable for elevated D-dimers (6920 μg/L) and C-reactive protein (66.30 mg/L). Chest x-ray did not reveal active pulmonary disease, and brain computed tomography scan revealed no abnormal findings. The computed tomography of the spinal cord conducted during the patient's first visit to the emergency department showed no evidence of fracture or other abnormalities.

The patient was admitted in the internal medicine ward for further investigation. Serological testing revealed positive antibodies against syphilis (IgG/IgM: 31.0 S/CO). The Venereal Disease Research Laboratory (VDRL) test of the serum was positive (1:16). Further study for *Treponema pallidum* Hemagglutination Assay (TPHA) in serum was also positive (>1: 2560). Tests for HIV, and hepatotropic viruses were negative. A lumbar puncture was performed. Cerebrospinal fluid (CSF) analysis was significant for WBC 86/μL, (81% lymphocytes), RBC 8 c/μL, glucose 52 mg/dl (serum glucose 122 mg/dl) and protein 136.6 mg/dl. The film array, Gram stain and cultures of the cerebrospinal fluid were negative. Oligoclonal IgG studies of CSF revealed no oligoclonal bands and anti-aquaporin-4 antibodies were negative. Cerebrospinal fluid testing for Rapid Plasma Reagin (RPR) was positive 1:2, Treponema pallidum Hemagglutination Assay (TPHA) was also positive 1:320 and *Treponema pallidum* IgM were indeterminate. The confirmatory Western Blot Syphilis TP test was positive.

Magnetic resonance image (MRI) of the brain with gadolinium revealed multiple small bilateral lesions (at least 13), predominantly in the subcortical white matter, exhibiting increased signal intensity on T2/ FLAIR sequences without pathological enhancement or diffusion restriction (figure 1). Additionally, a small focal area of low signal intensity was observed on the SWI sequence in the right parietal region, likely due to

Figure 1. Magnetic resonance imaging of the brain with contrast. Multiple small bilateral lesions predominantly in the subcortical white matter, with increased signal intensity in T2/ FLAIR sequences without pathological enhancement or diffusion restriction.

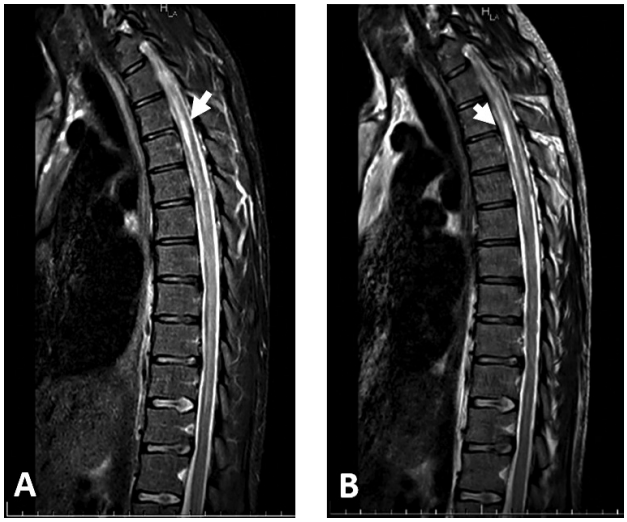
Slika 1. Magnetska rezonancija mozga s kontrastom. Višestruke male bilateralne lezije, predominantno u subkortikalnoj bijeloj tvari, s povećanim signalom na T2/FLAIR sekvencama, bez patološkog pojačanja kontrasta ili restrikcije difuzije.



calcification or hemosiderin deposition. No pathological signal intensity or enhancement was noted in the brainstem or cerebellum. MRI of the thoracic spine revealed an extensive lesion with increased signal intensity on STIR/T2 sequences, centrally intramedullary, from the level of T1-T2 down to the T10-T11 intervertebral space (figure 2A and 2B). Additionally, mild swelling of the spinal cord was noted, primarily in the upper thoracic region. Findings were consistent with transverse myelitis. No pathological signal foci were detected in the cervical and lumbar spine on Magnetic Resonance Imaging evaluation.

Figure 2. Magnetic resonance imaging of the thoracic spine with contrast. (A) Increased signal intensity on STIR and (B) on T2 sequences, centrally intramedullary, from the level of T1-T2 down to the T10-T11 intervertebral space.

Slika 2. Magnetska rezonancija torakalne kralježnice s kontrastom. (A) Povišen signal na STIR sekvencama i (B) na T2 sekvencama, centralno intramedularno, u rasponu od razine T1–T2 do intervertebralnog prostora T10–T11.



As the diagnosis of neurosyphilis was established, the patient was commenced on penicillin G, 4 million IU q4h for 14 days and intravenous methylprednisolone at a dosage of 1000mg daily for 5 days. Additionally, the patient underwent daily intensive physiotherapy sessions with progressive improvement in mobility. He gradually began to regain sensation in the lower extremities and regain control of the sphincters, with no further difficulty in urination or urinary retention after the removal of the catheter. He was discharged and transferred to a rehabilitation center for assistance with standing and intensive physical therapy until full recovery.

Unfortunately, the patient returned to his home country, preventing the completion of necessary post-treatment follow-up.

Discussion

The spirochete *Treponema pallidum* is the bacterium responsible for syphilis, a sexually transmitted disease that can be acquired or transmitted vertically from the mother to the newborn[1]. According to the ECDC annual epidemiological report for 2022, syphilis cases in Cyprus have shown an upward trend over the last years, from 2018 to 2022, with a peak recorded in 2021 at a total of 92 cases per 100,000 population (at a rate of 10.3). The prevalence is significantly higher among men compared to women (approximately 8 times greater), particularly in the 25–34 age group. The majority of patients diagnosed with syphilis belong to the group of men who have sex with men, accounting for 74% of cases[2]. The patient referred to in this case report belongs to this group. He presented with symptoms compatible with neurosyphilis, a rare and potentially life-threatening complication of the disease[3], that can occur at any stage of it[4].

Neurosyphilis can manifest in various forms. Some of these, according to Jo Yaphockun et al. [4], appear in the early primary or secondary stages of syphilis (early neurosyphilis) and include asymptomatic neurosyphilis (ANS), meningeal neurosyphilis, and meningovascular neurosyphilis. Other forms appear in more advanced stages of disease, during the tertiary stage, affecting the parenchyma of the central nervous system. These relate to the entity of late neurosyphilis and include general paresis and tabes dorsalis, a potentially fatal condition if left untreated.

Transverse myelitis, in the context of neurosyphilis, mostly appears as part of the meningovascular form of early neurosyphilis[3]. It is a rare inflammatory process that affects the spinal cord[4]. In this case report, a characteristic image on the contrast–enhanced magnetic resonance imaging was revealed, with an extensive lesion with increased signal intensity on STIR/T2 sequences, centrally intramedullary, from the level of T1-T2 down to the T10-T11 intervertebral space. Depending on the level of the spinal cord affected, transverse myelitis can manifest with paresis or plegia of the upper and/or lower limbs. Other symptoms include hypoesthesia or sensory disturbances such as burning, numbness, pricking, or tingling in the limbs, or heightened sensitivity to touch. Additionally, it may cause loss of bowel or bladder sphincter control and occasionally back or neck pain, or sexual dysfunction[5,8]. When symptoms such as the above were identified in our patient, an immediate evaluation was performed,

including imaging of the spine with CT and MRI, as well as a lumbar puncture to examine the cerebrospinal fluid[6]. After the results, we had to contend with a wide range of conditions involved in the differential diagnosis of neurosyphilis, as many causes can lead to transverse myelitis.

The latter is a neurological condition characterized by inflammation of the spinal cord, leading to sensory, motor, and autonomic dysfunction. The differential diagnosis of TM encompasses a wide range of etiologies, including infectious, autoimmune, neoplastic, vascular, metabolic and idiopathic causes[9,10,11]. Accurate diagnosis is essential for effective management and requires thorough clinical, laboratory, and imaging evaluation.[7]

The diagnosis of transverse myelitis in the setting of neurosyphilis is based on a combination of clinical and laboratory findings. It requires initial suspicion of central nervous system involvement, with a clinical presentation consistent with transverse myelitis. Also confirmed syphilis by positive serum treponemal and non-treponemal tests, along with cerebrospinal fluid pleocytosis with lymphocytic predominance, elevated protein and positive CSF treponemal and non-treponemal test, especially positive VDRL test. If the CSF VDRL test is negative but with high clinical suspicion for the disease, a confirmation can be done by testing CSF FTA-ABS.[12,13]

As previously mentioned, it is important to conduct thorough laboratory and paraclinical investigations to clarify the exact cause of transverse myelitis, in order to provide the patient with the appropriate treatment. There are many mimics of neurosyphilis, so the clinician must be aware of the wide range of differential diagnosis. A good medical history and a thorough clinical examination can greatly assist the attending physician in guiding towards the likely diagnosis. It is important to confirm the diagnosis of neurosyphilis with specific tests, as it is a condition that, if recognized early, can be completely cured. On the other hand, if the diagnosis is delayed and the syphilitic transverse myelitis remains untreated, it can have devastating consequences for the patient.

Conflict of interest

The authors declare no conflict of interest.

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