

Metronidazole-Induced Sensory Neuropathy : A Rare Case Report

Chang Hee Lee, Jecheon Seong, Yoon Ji Lee, Aram Kim
Department of Physical Medicine and Rehabilitation, Myongji Hospital

INTRODUCTION

- Metronidazole, a synthetic antibiotic derived from azomycin (a nitroimidazole produced by *Actinobacteria* and *Proteobacteria*), is widely used for anaerobic and protozoan infections.
- It is administered orally, intravenously, vaginally, or rectally, with oral formulations (250 mg or 500 mg) being the most common due to rapid systemic absorption.
- Hepatic metabolism via hydroxylation, acetylation, and glucuronide conjugation is followed by renal excretion of metabolites.
- Although generally safe, rare neurotoxic effects, including central nervous system disturbances and peripheral neuropathy, have been reported.
- This case highlights metronidazole-induced sensory peripheral neuropathy, emphasizing the importance of early recognition in clinical practice.

Case Presentation

- F/66
- No significant medical history
- **December 21, 2024**
Fever and altered mental status
Imaging revealed multiple brain abscesses(Fig1.) and suspected lung abscesses
- **January 6, 2025**
Transferred to our neurosurgery department on, and treated with intravenous antibiotics (ampicillin, metronidazole, and meropenem) for six weeks
- **February 1, 2025**
Her condition improved, and she was discharged on, with oral antibiotics (amoxicillin/clavulanate, moxifloxacin, and metronidazole).
- **February 2~5, 2025**
Vomiting and nausea, followed by slurred speech two days later
A follow-up brain MRI showed cerebellar lesions suggestive of metronidazole toxicity (Fig1.), with bilateral lower extremity paresthesia
- Electromyography (EMG) and nerve conduction studies (NCS) were requested
- **Neurological Examination (February 25, 2025)**
 - **Motor strength** : Normal in all limbs.
 - **Sensory deficits** :
 - Reduced temperature sensation below the left thigh.
 - Reduced pain sensation below both knees.
 - Reduced light touch sensation below the left thigh.
- **EMG/NCS Findings (February 25, 2025) (Table 1.)**
 - **Motor nerves** : Normal conduction velocities and amplitudes.
 - **Sensory nerves** : Absent responses in bilateral saphenous, superficial/deep peroneal, and sural nerves.
 - **F-wave** : Absent in bilateral peroneal nerves.
 - **H-reflex** : Absent in the left tibial nerve.
 - **EMG** :
 - Reduced insertional activity in the left abductor hallucis.
 - Unrecordable motor unit potentials in the left abductor hallucis and gluteus medius.
- These findings confirmed **severe axonal sensory neuropathy** in the lower extremities, consistent with **drug-induced (metronidazole)**, infectious, autoimmune, or paraneoplastic etiologies.

Medication History

- **December 21–31, 2024** :
Ampicillin + metronidazole + meropenem
- **January 7–13, 2025** :
Vancomycin + ceftriaxone + metronidazole
- **January 14–February 1, 2025** :
Ceftriaxone + metronidazole.
- **February 1–4, 2025** :
Amoxicillin/clavulanate + moxifloxacin + metronidazole
- **February 5–9, 2025** :
Ceftriaxone
- **February 10 -, 2025** :
Amoxicillin/clavulanate + moxifloxacin

Sensory NCS

Nerve / Sites	Rec. Site	O. Lat ms	Sig.	O.P Amp μ V	Sig.	Distance cm	Onset Vel m/s	Sig.
L Median - Dig II								
Wrist	Digit II	2.67		24.33		14	52.50	
Wrist	Digit II	2.69		27.40		14	52.09	
R Median - Dig II								
Wrist	Digit II	2.79		23.69		14	50.15	
Wrist	Digit II	2.79		21.93		14	50.15	
L Ulnar - Dig V								
Wrist	Dig V	2.35		18.34		12	50.97	
Wrist	Dig V	2.40		21.69		12	50.09	
R Ulnar - Dig V								
Wrist	Dig V	2.38		17.47		12	50.53	
Wrist	Dig V	2.35		17.83		12	50.97	
L Superficial peroneal - Ankle								
Calf	Ankle	NR		NR				
Calf	Ankle	NR		NR				
R Superficial peroneal - Ankle								
Calf	Ankle	NR		NR				
Calf	Ankle	NR		NR				
L Deep peroneal - Ankle								
Ankle	Ankle	NR		NR				
Ankle	Ankle	NR		NR				
L Sural								
Leg	Ankle	NR		NR				
Leg	Ankle	NR		NR				
R Sural								
Leg	Ankle	NR		NR				
Leg	Ankle	NR		NR				
R Saphenous - Ankle								
Calf	Ankle	NR		NR				
Calf	Ankle	NR		NR				
L Saphenous - Ankle								
Calf	Ankle	NR		NR				
Calf	Ankle	NR		NR				

Table 1. Sensory Nerve Conduction Study

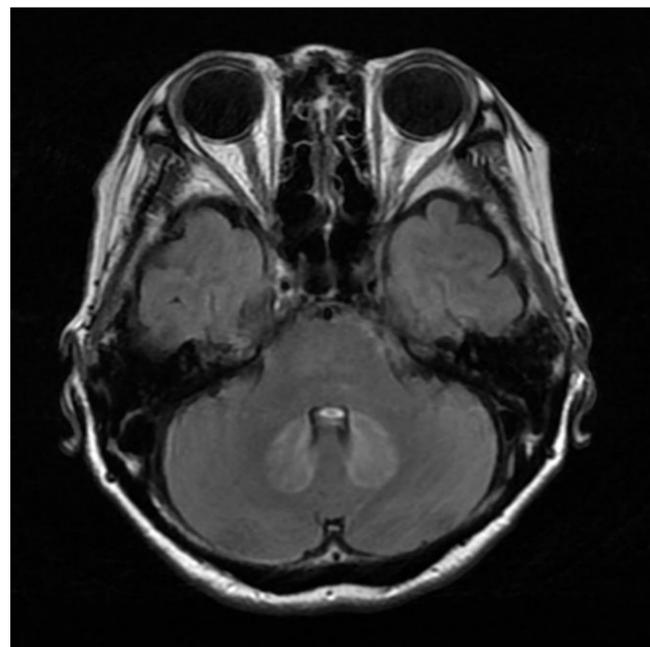


Figure 1. Brain MRI : T2 Weighted Image

CONCLUSION

- This case illustrates metronidazole-induced sensory neuropathy, a rare but clinically significant adverse effect. Despite its broad safety profile, prolonged or high-dose metronidazole therapy may cause axonal damage, particularly in sensory nerves. Clinicians should consider metronidazole toxicity in patients presenting with lower extremity sensory deficits, especially after extended antibiotic regimens. Early discontinuation and multidisciplinary management are critical to mitigating long-term neurological sequelae.

