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# A case of peripheral neuropathy caused by rhabdomyolysis with hypothyroidism: A case report

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## INTRODUCTION

Rhabdomyolysis is a syndrome caused by an injury to skeletal muscle and characterized by myalgia and swelling of the affected muscle. Common complications include electrolyte imbalances, acute renal failure, compartment syndrome, and, in rare case, peripheral nerve injury occurs in patients with rhabdomyolysis. We report a case of peripheral neuropathy as a complication of rhabdomyolysis diagnosed through electromyographic study.

## CASE

A 16-year-old female with no significant past medical history, visited our clinic due to swelling and pain in both lower extremities, especially in the left lower leg, along with anterolateral aspect of the left distal leg hypoesthesia, started a week ago. She recently went through intensive training as a hockey player. As family history, her mother had hypothyroidism (Hashimoto's Thyroiditis). The patient often felt chills and fatigue although it was summer in June. She also gained 5 to 6 kilograms in the past month. Physical examination showed a 30% decrease in sensation of the Lt. superficial peroneal n. sensory distribution area compared to the right side. The left lower leg was markedly thickened and edematous than the right, calf circumference measuring at 40cm and 38cm, respectively, causing pain.

Laboratory results, presented in Table 1, showed an increase in creatin kinase (CK), creatinine (Cr), thyroid stimulating hormone (TSH), and a decrease in free thyroxine (F-T4). Myositis autoantibodies tests were all negative. T2 weighted Fat suppression images of Lt. leg MRI showed high signal intensity of the superomedial soleus m. compared to adjacent muscles (Figure 1). The patient was diagnosed with rhabdomyolysis and severe hypothyroidism (Hashimoto's Thyroiditis). Electromyographic study was performed for the constant Lt. lower leg hypoesthesia. Sensory nerve conduction study showed a 40% decrease amplitude at the left superficial peroneal nerve (foot recording), compared to the right side, with increased in distal latency and reduced conduction velocity. The patient was diagnosed with Lt. superficial peroneal neuropathy, sensory dominant, axonotmesis type.

The patient was conservatively managed for rhabdomyolysis including hydration and was treated with levothyroxine for hypothyroidism. A 6-month follow up showed no laboratory abnormalities with complete resolution of symptoms, including pain, edema, and hypoesthesia.

**Table 1.** Laboratory findings

| Laboratory analysis | Result | Unit | Reference value |
|---|---|---|---|
| **AST** (Aspartate Aminotransferase) | **77** | U/L | <35 |
| **ALT** (Alanine Aminotransfrease) | **65** | U/L | <35 |
| **CK** (Creatine Kinase) | **601** | U/L | <145 |
| **Cr** (Creatinine) | **1.14** | mg/dl | 0.51~0.95 |
| T3 | 116 | ng/dl | 81~197 |
| **F-T4** | **0.22** | ng/dl | 0.7~1.8 |
| **TSH** | **>85** | mIU/L | 0.3~4.0 |
| **TG-Ab** | **201.6** | IU/ml | 0~70 |
| **TPO** | **>3000** | u/ml | 0~60 |
| **TBII** | **1.4** | IU/L | 0~1.0 |
| Anti-Sm/RNP Antibody | Negative | AAU/ml | |
| Anti-SS-A Antibody | Negative | AAU/ml | |
| Anti-SS-B Antibody | Negative | AAU/ml | |
| Anti Smith Antibody | Negative | U/ml | |
| Anti-Jo-1 Antibody | Negative | U/ml | |
| Anti ds-DNA IgG | Negative | U/ml | |
| Anti-MPO (P-ANCA) | Negative | Index | |
| Anti-PR3 (C-ANCA) | Negative | Index | |

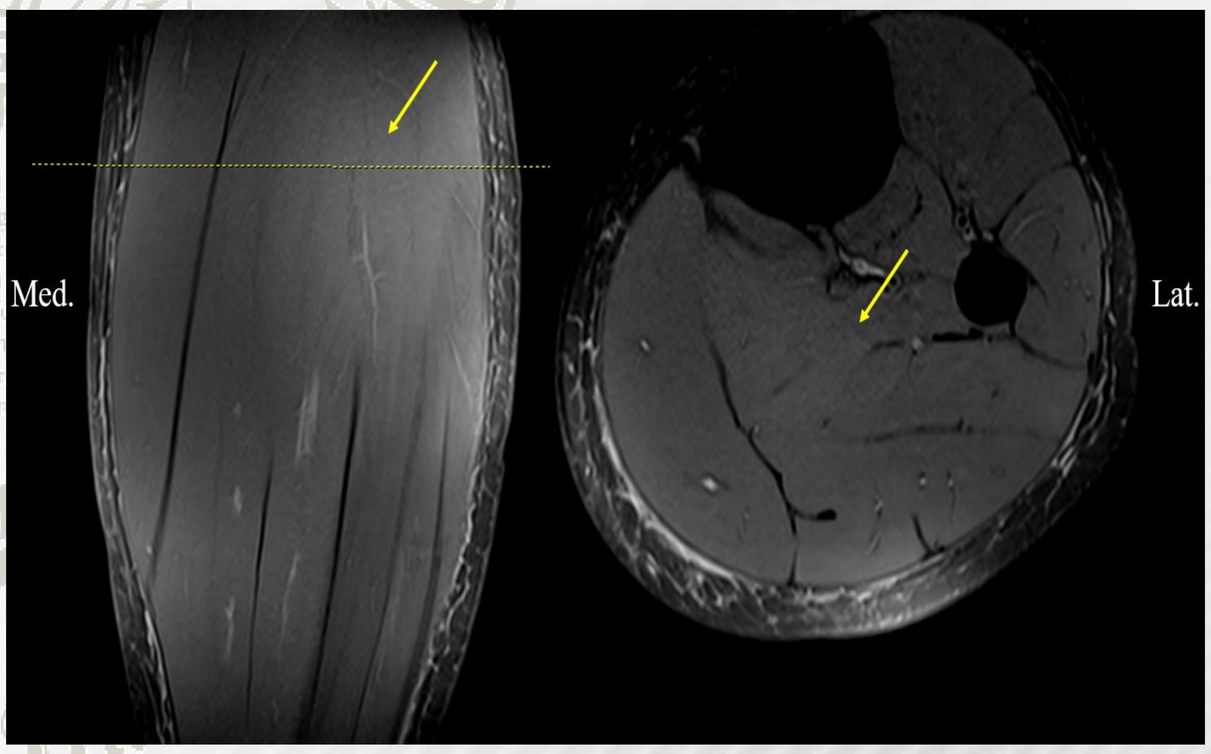


**Figure 1.** T2 weighted fat supression coronal (left) and axial (right) MRI of left leg, showing high signal intensity of superior medial portion of soleus muscle(arrow).

**Table 1.** Laboratory findings

| Nerve | Latency (ms) / (NL) | Amplitude (mV) / (NL) | Velocity (m/s) |
|---|---|---|---|
| Sensory | | | |
| Left superficial peroneal | **4.2** (≤ 3.3) | **6.6** (≥ 13) | **33.3** |
| Right superficial peroneal | 3.6 (≤ 3.3) | 16.8 (≥ 13) | 38.4 |
| Left sural | 3.7 (≤ 3.4) | 9.9 (≥ 15) | 37.8 |
| Right sural | 3.8 (≤ 3.4) | 15.0 (≥ 15) | 36.8 |

**Note**: All sensory and mixed latencies are regarded as peak latencies. All sensory and mixed nerve conduction velocities were calculated using onset latencies.
**Abbreviations**: NL, normal.

## CONCLUSION

We report a rare case of a patient diagnosed with peripheral neuropathy as complication of rhabdomyolysis. Rhabdomyolysis is a potential complication of hypothyroidism. The patient with underlying hypothyroidism precipitate rhabdomyolysis through excessive exercise, resulting superficial peroneal neuropathy. Therefore, symptoms such as fatigue, weight change, and muscle pain that appears in athletes needs scrutiny whether it is caused by exercise or other underlying disease. Also, athletes with hypothyroidism should take extra precaution for myopathy during training.

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