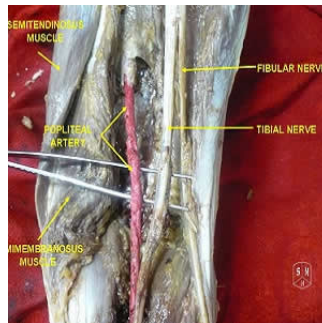


Dynamic ultrasound for detecting soleus arcade syndrome



The soleus arcade syndrome (SAS) is a rare compression neuropathy of the tibial nerve that often remains undiagnosed due to low clinical awareness and difficult diagnosis. A case report in the journal *Medical Ultrasonography* describes a new diagnostic approach to identifying soleus arcade syndrome using ultrasound.

Comparable to other peripheral compression neuropathies such as the posterior interosseous nerve syndrome, the tibial nerve (TN) is thought to face repeated or sustained compression leading to oedema, perfusion imbalances and demyelination with axonal damage in late stages.

Routinely, after a working diagnosis of SAS is established clinically, electrodiagnostic testing (EDx) is performed. "While EDx may demonstrate reduced sensory nerve conduction velocity, probably due to Schwann cell degeneration, findings can be unspecific due to the intermittent character of the strangulation mechanisms. The exact localisation of nerve constriction is difficult due to the deep TN course," the report authors explain.

They say magnetic resonance imaging (MRI) may in principle be used for the identification of SAS; however, its rather low resolution, predefined examination region and geometry, and impracticality of dynamic examinations limit its diagnostic use. In contrast, high-resolution ultrasound (HRUS) can be tailored to the functional peculiarities in patients with TN neuropathies: compression and decompression of the TN as well as subsequent structural changes can be examined dynamically.

In the report, the authors present the first case of a HRUS-based dynamic diagnosis of SAS in a 53-year old female patient and propose a dynamic HRUS examination technique to corroborate the diagnosis of SAS. The patient was admitted with acute worsening of a pre-existing sensory tibial neuropathy and acute TN palsy after knee joint injection. After a knee MRI remained non-diagnostic, dynamic ultrasonography was performed. Constriction by the soleus arcade and proximal swelling of the TN could be demonstrated during plantarflexion of the ankle by means of a dynamic examination in the standing patient. In addition, ventral displacement of the neurovascular bundle was seen due to a ganglionic cyst.

Thus, the diagnosis of a motion-dependent compressive TN neuropathy was established and an acute surgical intervention was performed, confirming the above findings intraoperatively. After surgical preparation and resection of the ganglion, the neurovascular bundle was found to contain a markedly swollen TN segment proximal to its entry under the SA. The patient underwent surgery and recovered fully.

In our patient, the authors note, neural compression at the SA was not appreciated in the initial knee MRI workup and the most likely cause for the patient's symptoms was considered to be a ruptured ganglionic cyst. Furthermore, other differential diagnoses difficult to assess by MRI such as venous claudication can be identified by HRUS, they add.

The authors conclude that "HRUS appears to be useful in the workup of suspected SAS as it allows the dynamic high-resolution assessment of the TN, pinpointing the exact localisation of neural damage and identify other causative mechanisms, potentially increasing diagnostic reliability and avoiding unnecessary surgical interventions."

Source: [Medical Ultrasonography](#)
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