



## Case Report

# Local compression of the sciatic nerve by a vascular malformation as a rare cause of sciatica: A case report and review of literature

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## ABSTRACT

**Background:** Sciatica is typically caused by disc herniations or spinal stenosis. Extraspinal compression of the sciatic nerve is less frequent.

**Case Description:** We report a rare case of sciatica with compression of the sciatic nerve by a low-flow vascular malformation in a 24-year-old female patient. The special feature of this case was sciatica along the S1 dermatome, which only occurred in the sitting position and inclination because of compression of the sciatic nerve between the vascular malformation and the lesser trochanter. Spinal imaging showed no abnormal findings. Surgery was performed interdisciplinary and included neurosurgery, vascular surgery, and trauma surgery. After surgery, the patient became symptom-free.

**Conclusion:** Rare and extraspinal causes of local compression of the sciatic nerve should be considered, especially in cases of lacking spinal imaging correlation and untypical clinical presentation. Interdisciplinary surgical cooperation is of special value in cases of rare entities and uncommon locations.

**Keywords:** Compression sciatic nerve, Sciatica, Vascular malformation

## INTRODUCTION

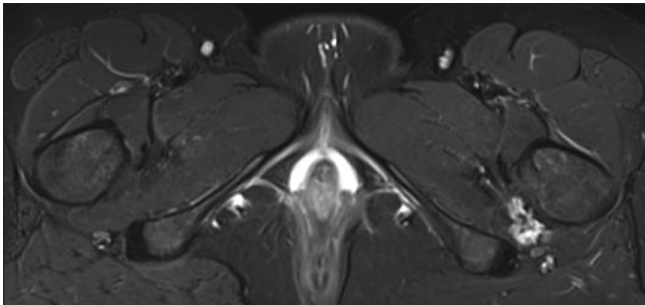
Sciatica is pain that radiates from the buttock downward along the course of the sciatic nerve.<sup>[9]</sup> It is commonly caused by compression of the sciatic nerve within the spinal canal or neuroforamen. Nondiscogenic sciatica is less frequent and can have tumorous and nontumorous causes such as “piriformis syndrome” or extrauterine endometriosis.<sup>[4,5]</sup> We present a rare case of sciatica caused by local compression of the sciatic nerve by a vascular malformation and its special clinical presentation.

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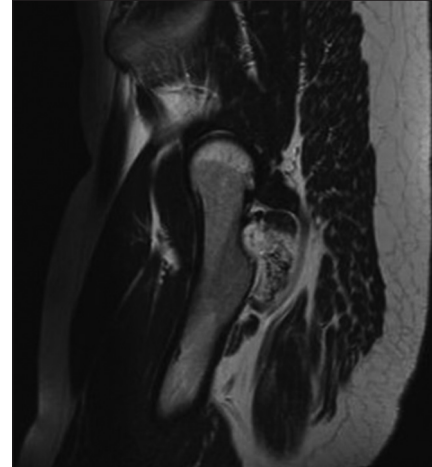
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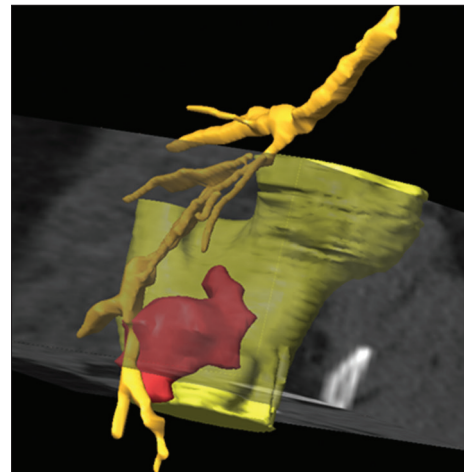
**Figure 1:** Preoperative magnetic resonance imaging of the spine shows no underlying pathology for the symptoms.



**Figure 2:** Axial preoperative magnetic resonance imaging of the pelvis shows a lesion in proximity to the lesser trochanter.



**Figure 3:** Sagittal preoperative magnetic resonance imaging of the pelvis shows a lesion in proximity to the lesser trochanter.



**Figure 4:** 3D-reconstruction illustrating compression of the sciatic nerve (orange) by a vascular malformation (red) located between the nerve and the lesser trochanter (trochanter in yellow). The reconstruction was created with the Brainlab iPlan Cranial software (Brainlab, Munich, Germany).

## CASE DESCRIPTION

### History and examination

A 24-year-old female patient presented with a 3-month history of intermittent paraesthesia and paresis in the left leg. The symptoms were mostly exacerbated by exercise. Especially while walking, the patient reported lumbago and pain in the left groin, left ventral proximal thigh, and partially lower abdomen. The special feature of this case was sciatica along the S1 dermatome, which only occurred in the sitting position and inclination. The pain was described as lasting for several minutes.

In clinical neurological examination, hip flexion on the left side scored 4/5 on the Medical Research Council (MRC) power scale, most likely due to pain-related poor innervation. Extension of the left foot was reduced to MRC 4+/5. During the examination of superficial sensory function, the patient complained about hypesthesia along the left S1-dermatome. Further, the patient presented with a slightly limping gait.

Primarily, a gynecological examination was performed, which could not reveal any reason for the symptomatology. Further, magnetic resonance imaging (MRI) of the lumbar spine was initiated but could not detect any abnormal

findings [Figure 1]. MRI of the pelvis showed an irritation of the sciatic nerve by a vascular malformation in proximity to the lesser trochanter [Figures 2-4]. MRI characteristics were indicative of a low-flow vascular malformation.

Conservative treatment with pain medication and physiotherapy did not lead to significant improvement. Consequently, surgery was indicated.

### Surgery and postoperative course

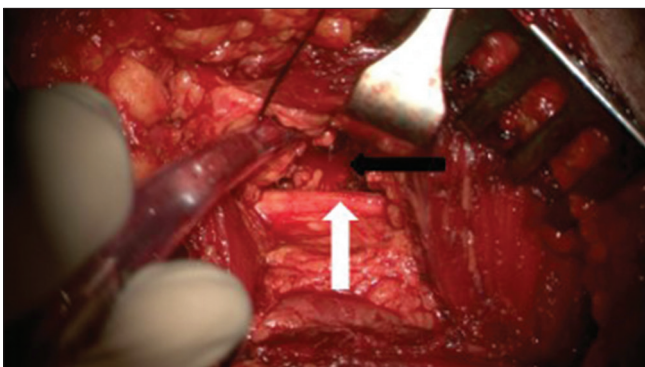
Because this uncommon entity crossed the borders of different medical fields, the operation was performed interdisciplinary and included neurosurgery, vascular surgery, and trauma surgery. Intraoperative neurophysiological monitoring (IONM) was administered, including free-running and triggered EMG (ISIS, Inomed GmbH, Emmendingen, Germany). The patient was put in a right-sided position. A Kocher–Langenbeck approach was conducted, which allows direct visualization of structures located on the posterior side of the trochanter. The sciatic nerve and pathology were visualized [Figure 5]. External neurolysis was performed under the microscope. The low-flow vascular malformation was resected according to the principles of vascular surgery by a stepwise closure of the vascular supply. After complete resection, the final inspection showed no resistance [Figure 6]. IONM showed no pathological discharges.

Postoperative, the patient became completely symptom-free.

### Histopathological findings

4.5 × 4.5 × 2.5 cm specimen, including slightly dilated vessels and locally calcified portions [Figure 7].

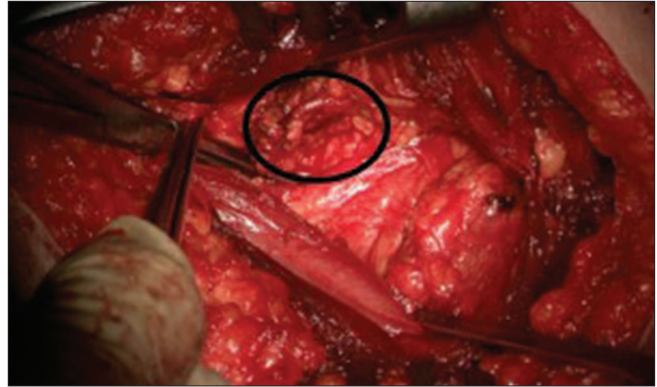
Microscopic analysis revealed an irregular non-capsulated vascular lesion infiltrating both the lipodystrophy skeletal muscle and fibro-lipomatous soft tissues. Focal intraluminal thrombi and accumulation of hemosiderophages were present throughout the lesion. No cellular atypia was observed [Figure 8].



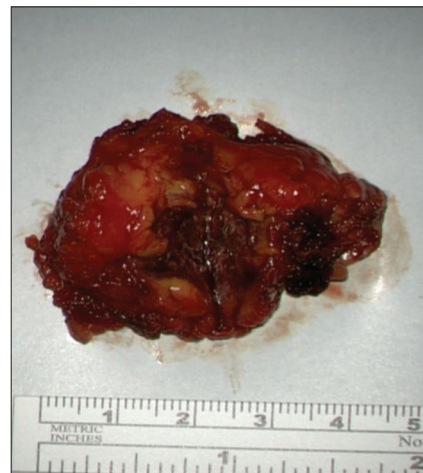
**Figure 5:** Intraoperative situs showing the proximity of the resection cavity (black arrow) to the sciatic nerve (white arrow).

## DISCUSSION

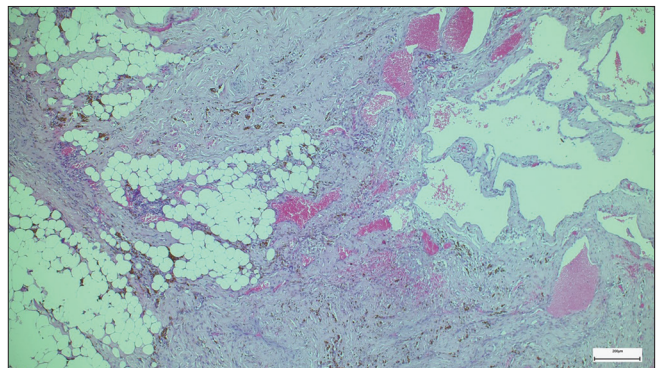
Sciatica is a very frequent symptom in clinical practice and is reported to be associated with disc herniations in 87% of cases.<sup>[8]</sup> Extrapinal causes of sciatica are more rare. These may include entrapment syndromes such as piriformis syndrome, tumors within the pelvis, or obstetrical sciatic



**Figure 6:** Intraoperative situs showing the vascular malformation (black ellipse).



**Figure 7:** Macroscopic view of the resected vascular malformation.



**Figure 8:** Histopathological image of the vascular malformation.

compression by the head of the fetus.<sup>[9]</sup> In very rare cases, venous compression has been described as a cause of peripheral neuropathy.<sup>[6,7]</sup> If the lesion is located close to the sciatic nerve, it may mimic symptoms commonly known as lumbar disc herniation or spinal canal stenosis.

Vascular malformations are categorized into low-flow and high-flow lesions.<sup>[11]</sup>

Clinically, venous malformations are soft, blue lesions that are compressible and can enlarge with dependent positioning or following physical exercise like in this case.<sup>[6]</sup> The exacerbation of the pain in the sitting position was noticeable in this case. Venous malformations are most frequently found in the head and neck but can occur in any part of the body.<sup>[1,3]</sup> In a few cases, venous varicosity with compression of the sciatic nerve has been reported as a cause of the extraspinal origin of lower extremity radicular pain.<sup>[2,7]</sup>

The exact mechanism of peripheral neuropathy caused by vascular lesions is unknown. Pain is noticeably exaggerated by exercise and may be an effect of direct compression, ischemia caused by diversion of blood flow from the nerve, or venous hypertension.<sup>[10]</sup>

## CONCLUSION

In cases where spinal imaging cannot reveal spinal morphological correlation for the treatment of refractory radicular pain, a more peripheral-located nerve compression should be considered.

Rare causes of local compression of the sciatic nerve should be considered, especially in cases of lacking spinal imaging correlation and untypical clinical presentation.

Interdisciplinary cooperation is of paramount value in treatment when the patient's condition crosses the borders of classic medical fields.

## Ethical approval

Institutional Review Board approval is not required.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

## Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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