

Persistent sciatic vein

Persistência da veia ciática

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Abstract

Background: During a period of embryonic life, the sciatic vein is the main lower limb collector. In vascular embryogenesis, there is a differentiation of the angioblasts in a primitive vascular plexus, with posterior remodeling and expansion. Consequently, anomalies may form during this process. When there is persistent sciatic vein, it may communicate with the small saphenous vein or with the popliteal vein at some point of its path, being anastomosed to the superior perforating vein and to the medial circumflex femoral vein.

Objective: To report a case of bilateral persistent sciatic vein on the lower limbs and review the literature on the subject.

Methods: Thirty-two lower limbs from 16 cadavers preserved in formaldehyde were dissected at the Laboratory of Anatomy of the Discipline of Topographic Anatomy of the Medical School of *Universidade Santo Amaro* (Unisa), during 2006 and 2007, and the sciatic vein was observed in both lower limbs of one cadaver.

Results: On the left lower limb of a cadaver that presented bilateral anomaly, the vein was 37 cm long, originating in the popliteal vein, accompanying the sciatic nerve, perforating the long adductor muscle and draining into the deep femoral vein. On the right lower limb, it was 36 cm long, emerged receiving the veins of the anterior tibial compartment alongside the sciatic nerve, perforated the long adductor muscle and drained into the internal iliac vein.

Conclusion: The anatomical variations of the lower limb venous system are the most common ones. Persistent sciatic vein may cause chronic venous failure in the lower limbs, therefore it must be investigated aiming at a better clinical or surgical management.

Keywords: Anatomy; vein; sciatica.

Resumo

Contexto: Durante um período da vida embrionária, a veia ciática é a principal coletora do membro inferior. Na embriogênese vascular, há diferenciação dos angioblastos em um plexo vascular primitivo, com posterior remodelagem e expansão. Consequentemente, durante esse processo, podem ocorrer anomalias. Quando ocorre persistência da veia ciática, esta pode se comunicar com a veia safena parva ou com a veia poplíteia durante seu percurso, anastomosando-se com a veia perfurante superior e com a veia circunflexa medial do fêmur.

Objetivo: Relatar o caso da persistência bilateral de veia ciática nos membros inferiores, comparando à literatura.

Métodos: Foram dissecados 32 membros inferiores de 16 cadáveres formolizados no Laboratório de Anatomia pela Disciplina de Anatomia Topográfica da Faculdade de Medicina da Universidade de Santo Amaro (Unisa), durante 2006 e 2007, observando-se em 2 membros inferiores de um único cadáver, a presença de veia ciática.

Resultados: No membro inferior esquerdo de um cadáver que apresentou a anomalia bilateralmente, a veia media 37 cm, tinha origem na região da veia poplíteia, acompanhava o nervo ciático, perfurava o músculo adutor magno e desembocava na veia femoral profunda. No membro inferior direito, ela media 36 cm, originava-se recebendo as veias do compartimento tibial anterior, acompanhava o nervo ciático, perfurava o músculo adutor magno e desembocava na veia íliaca interna.

Conclusão: As variações anatômicas do sistema venoso do membro inferior são as mais prevalentes. A persistência da veia ciática pode causar insuficiência venosa crônica no membro inferior e, dessa forma, deve ser investigada para uma melhor conduta clínica ou cirúrgica.

Palavras-chave: Anatomia; veia; ciática.

Study carried out at Medical School of Universidade de Santo Amaro (Unisa), São Paulo (SP), Brazil.

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Introduction

During a long period of embryonic life, when the sciatic artery is the main artery of the lower limbs, the sciatic vein represents the most important collector vein of these limbs' venous circulation¹.

During embryogenesis, blood islands containing angioblasts are derived from the extra-embryonic mesoderm. The vascular origin describes the differentiation of angioblasts in a primitive vascular plexus, with posterior remodeling and expansion, hence vascular anomalies may occur during this process².

The regulatory factors involved in the embryogenesis include the vascular endothelial growth factor and their receptors, as well as the hematopoietic system².

A sequence of changes in gene expression, even though the molecular basis of vascular morphology is not well established, is a possible cause of vascular anomalies. On the other hand, hemodynamic alterations and such anomalies may be associated with a generalized defect of the mesoderm².

The persistent sciatic vein (PSV) is a rare anomaly originated in the embryonic life that derives from posterior muscle affluents, ascends with the sciatic artery, receives posterior gluteal affluents and penetrates the pelvis through the subpyramidal portion. It follows the sciatic nerve medially and drains into the internal iliac vein, inferior gluteal veins or deep femoral vein³.

The sciatic vein may communicate with the terminal portion of the small saphenous vein or the popliteal vein, anastomosing with the perforating and medial circumflex femoral veins (Figure 1)¹.

This rare anomaly may be classified in three variations: complete, proximal or superior PSV, or distal or inferior. In complete PSV, the origin is the popliteal vein, ending up on the external iliac vein and crossing the thigh till the buttock. If proximal or superior, it emerges on the higher portion of the thigh and ends on the pelvis, involving the proximal portions of the thigh and buttock. If distal or inferior, it may be found in the inferior and medial portions of the thigh (Figure 2)⁴.

Objective

To study the frequency of complete bilateral persistence of the sciatic vein in the lower limbs, comparing the findings with the literature on the subject.

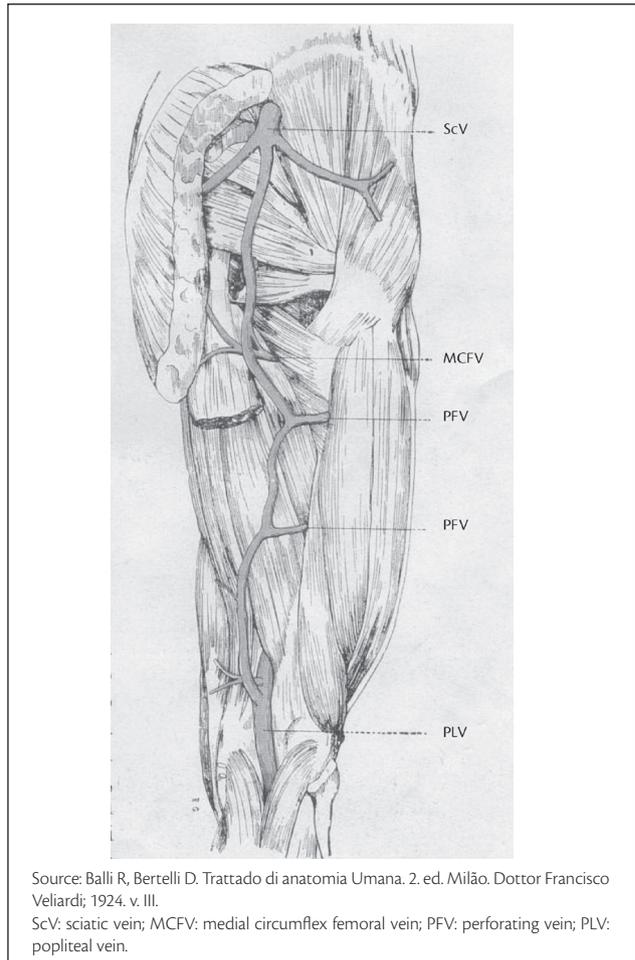


Figure 1 – Anastomosis of the sciatic and popliteal veins

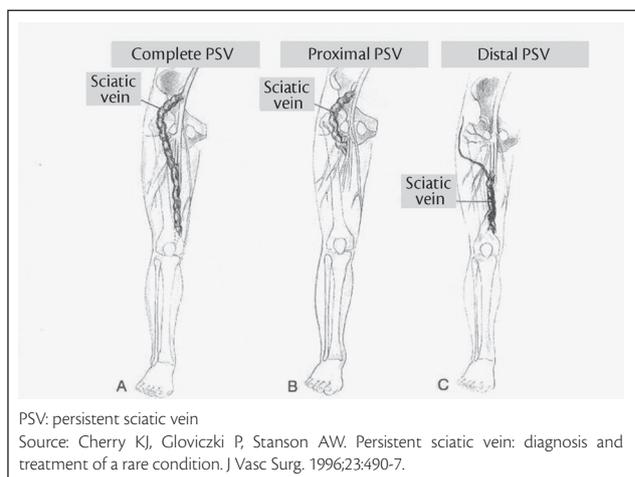


Figure 2 – (A) Complete persistent sciatic vein; (B) proximal persistence of the sciatic vein; (C) distal persistence of the sciatic vein.

Method

Thirty-two lower limbs from 16 cadavers preserved in formaldehyde were dissected at the Laboratory of Anatomy of the discipline of Topographic Anatomy of the Medical School of *Universidade Santo Amaro* (Unisa), São Paulo (SP), Brazil, during 2006 and 2007, and the sciatic vein was observed in both lower limbs of one cadaver.

Results

Out of the 32 analyzed lower limbs, 2 presented PSV (6.25%). Among the 28 lower limbs from male cadavers, the PSV was found in 7.14% of them, with one case of complete bilateral persistent vein.

The cadaver that presented complete bilateral persistent sciatic vein was that of a 48-year-old mulatto male that was 1.80 m tall.

The persistent sciatic vein in the left lower limb was 37 cm long, originating on the popliteal vein region, with contribution of the medial superior genicular and small saphenous veins. Its path went along with the sciatic nerve between the heads of the femoral biceps, perforating the lateral portion of the long adductor muscle and draining into the deep femoral vein (Figure 3A).

The persistent sciatic vein of the right lower limb was 36 cm long, was originated by receiving the anterior tibial compartment veins, with the contribution of the soleus and the small saphenous veins. It was deeper than the sciatic nerve and presented an ascendant direction, perforating the

lateral portion of the long adductor muscle and draining into the internal iliac vein. There were muscle contributions and it was independent of the popliteal vein that, in this limb, was hypoplastic (Figure 3B).

Discussion

According to Cherry et al.⁴, out of 41 studied patients, 21 had PSV (51.22%). Among them, 13 were women (61.9%), 8 presented complete PSV (1 bilateral), 6 superior PSV (also 1 bilateral), and 7 inferior PSV. Out of all patients, 19 presented unilateral PSV (90.5%), out of which 10 were found in the left lower limb⁴. All these data were associated with the Klippel-Trenaunay syndrome^{4,5}.

According to Pompeo et al.⁶, in a paper presented at the XXXV Brazilian Congress of Angiology and Vascular Surgery, a total of 41 lower limbs were dissected at the Service of Death Verification of the City of São Paulo, and 169 phlebographies were performed at the Service of Angiology and Vascular Surgery of *Hospital Santa Marcelina*, São Paulo (SP), Brazil. Among 210 lower limbs analyzed, 7 presented PSV (3.33%). Among these, 5 were male cadavers (71.4%) and 6 presented left lower limb PSV⁶.

Based on the mentioned papers and on the sample of our study, the anatomical variations of the venous system, especially those of the lower limbs, are the most common ones.

The PSV may lead to cases of chronic venous failure of the lower limb, which must be investigated. Magnetic resonance angiography and CT angiography are useful techniques for diagnostic assessment of the venous system,

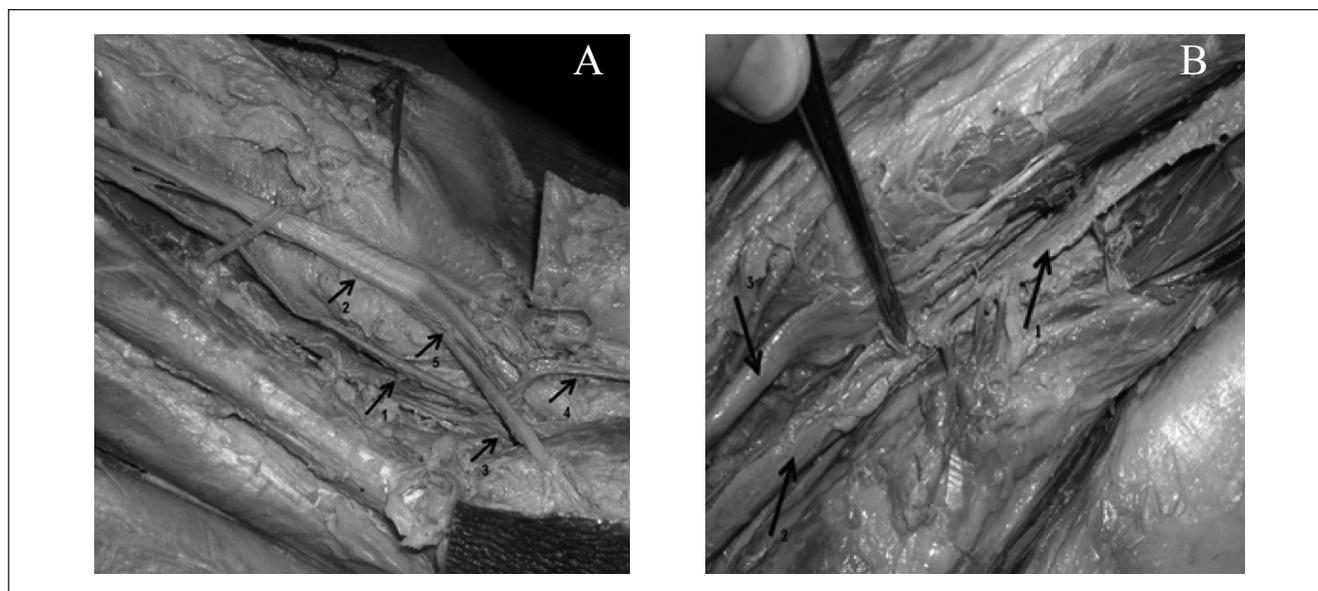


Figure 3 – (A) Sciatic vein on the left lower limb: (1) sciatic vein; (2) sciatic nerve; (3) popliteal vein; (4) small saphenous vein; (5) common fibular nerve. (B) Sciatic vein on the right lower limb: (1) sciatic vein; (2) small saphenous vein; (3) common fibular nerve.

for they evaluate characteristics, anatomical origin and relations of the varicose veins with venous malformations. Information about precedence, path and anatomical relations of the anomalous vessels helps to plan the treatment adequately, as well as to provide a better clinical and surgical management⁷.

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Authors' contributions

Dissection of the studied limbs: BBC, COA, MSM, MRQAL, MCK, RCMS and MCB
Bibliographical references search: BBC, COA, MSM, MRQAL, MCK and RCMS
Bibliographical data analysis: BBC, COA, MSM, MRQAL, MCK and RCMS
Writing of the paper: BBC, COA, MSM, MRQAL, MCK, RCMS and MCB