

Treatment Strategy for Persistent Sciatic Artery and Novel Classification Reflecting Anatomic Status

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WHAT THIS PAPER ADDS

This study will guide surgeons in the evaluation and treatment of patients with persistent sciatic artery. A new classification system and associated treatment options based on the anatomic status and the presence of aneurysm is proposed.

Background: Persistent sciatic artery (PSA) is a relatively rare congenital variant of the lower limb vasculature and can have highly variable clinical presentations. The purpose of this study was to analyze the relationship between PSA anatomy and clinical presentation, and to suggest an optimal management strategy.

Methods: Between 2001 and 2014, 24 PSAs in 19 patients were diagnosed by computed tomography and referred to the vascular surgery department. Patient demographics, types of PSA and femoral artery, aneurysmal changes, symptoms, and treatment methods were assessed. Additionally, all English literature from 1964 to 2014 was reviewed and compared using the PubMed database (224 PSAs in 171 patients).

Results: PSA was diagnosed in 10 men (52.6%) and nine women (47.4%). PSAs were bilateral in five patients (26.3%) and symptomatic in 12 patients, while in seven patients PSA was found incidentally. According to the Pillet-Gauffre classification, Type 2a was the most common variant ($n = 15/24$, 62.5%), with unclassifiable types in two limbs. Compared with cases in the literature, the PSA occlusion rate in this study was higher ($n = 10/24$, 41.7% vs. $n = 54/224$, 27.5%), but aneurysm incidence was higher in the literature cases ($n = 5/24$, 20.8% vs. $n = 112/224$; 50.7%). In this study, 16 limbs (66.6%) were treated conservatively, and six limbs were treated by open surgery, including four bypasses, one amputation, and one thrombo-embolectomy. Endovascular coil embolization was performed in one limb, and a hybrid procedure with stent graft was performed in one limb with PSA aneurysm. Based on the present series and the literature review, a new classification system and treatment option is proposed according to the anatomic status and the presence of aneurysm. According to the new classification, class III was the most common in both the present study (18/24; 75%) and the literature review, and the presence of aneurysm was the most important determinant of surgical treatment.

Conclusions: The new classification system is simple and provides guidance for management. Limb anatomy of the femoral artery system and the presence of PSA aneurysm should be considered when selecting the optimal treatment. The risk of embolism from the presence of aneurysm is an important factor for treatment, and bypass surgery is mostly required in classes III and IV.

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INTRODUCTION

Persistent sciatic artery (PSA) is a relatively rare congenital variant of the lower limb vasculature and can show highly variable clinical presentations.¹ It is important to identify

and treat PSA appropriately as it can be misdiagnosed as Buerger's disease, can lead to aneurysmal rupture, or to amputation if not treated adequately when it presents as acute limb ischemia.^{2–5} Some literature reviews on PSA have suggested treatment methods such as surgical bypass or stent graft insertion.^{1–3} However, there is lack of knowledge of the natural course of PSA, so a proper classification system reflecting prognosis, optimal management strategies, and roles of endovascular treatment is needed. Long-term results after open or endovascular treatment are also scarce.

The purpose of this study was to review experience of PSA management in the study population in comparison

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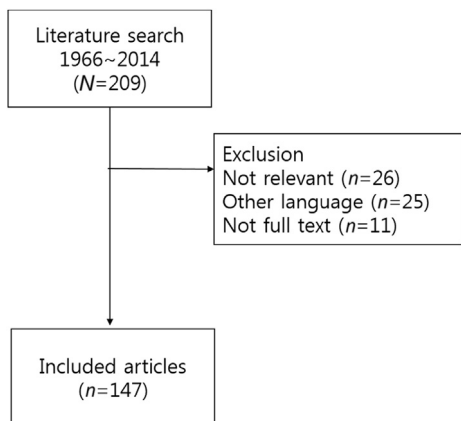


Figure 1. Flow chart of literature search.

with the current literature, to suggest a proper classification system and an optimal management strategy, and to define the role of the most popular endovascular therapies in PSA.

METHODS

Between 2001 and 2014, 19 patients (24 limbs) were diagnosed with PSA at Seoul National University Hospital, Seoul National University Bundang Hospital, and Yeouido St Mary’s Hospital, Seoul, Korea. All PSAs were confirmed with computed tomography angiography (CTA), the primary tool used to evaluate peripheral arterial diseases at the study institutions. Both symptomatic PSAs and incidentally found PSAs that were referred to a vascular surgeon were included in this study. Incidentally found PSAs included asymptomatic PSAs in the contralateral limb of patients with

symptomatic PSA in one limb, also PSAs that were found during work up for other diseases; fortuitous findings. One patient (one limb) who was diagnosed with PSA on CT but was not referred to the vascular surgery department and thus did not undergo any further tests, was excluded from this study.

Follow up CTA was performed in 12 of 19 patients (14 limbs) with a median follow up of 38.1 months (range 1–82 months).

The completeness and patency of the PSA and SFA, and the presence of atherosclerotic stenosis, thrombosis, or aneurysmal change were analyzed. Patient demographic data and information on treatments were obtained retrospectively from electronic medical records after approval by the institutional review board (IRB number: 1510–099–712) with waiver of informed consent. The study was performed in accordance with the Declaration of Helsinki and Good Clinical Practice guidelines.

Literature search and screening

The PubMed databases were searched for all articles published in English between 1964 and 2014. The following keyword combinations were used: “persistent sciatic artery,” “sciatic artery aneurysm,” “sciatic artery occlusion,” and “sciatic artery ischemia.” All case reports were included. A total of 209 articles were identified on the basis of title and content. After excluding editorials and conference abstracts, 147 articles were finally selected for data extraction (Fig. 1, supplementary references). Data extraction was performed using a standardized data extraction template. Extracted data included author name, publication year,

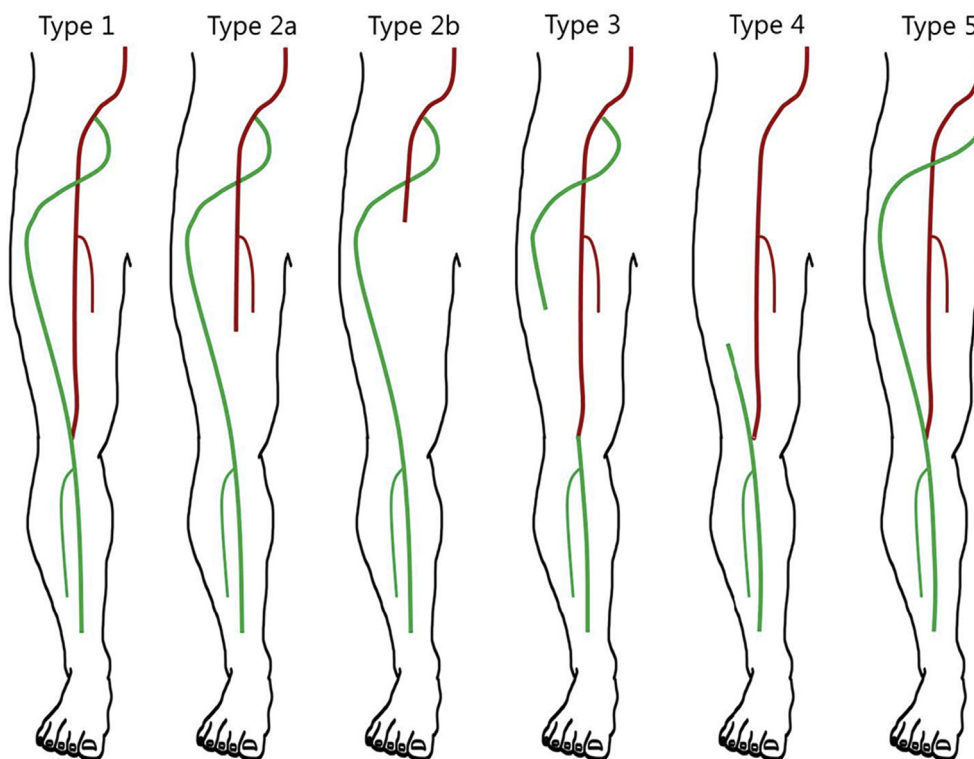


Figure 2. Pilllet classification (1980) of persistent sciatic artery, modified by Gauffre (1994).

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