

Persistent sciatic artery presenting as blue toe: Diagnostic dilemma

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ABSTRACT

A persistent sciatic artery (PSA) results from lack of regression of the fetal arterial blood supply of the leg and is often combined with an abnormally developed superficial femoral artery. Here in we would like to present a 63 year old woman presenting for the first time with blue toe and on further evaluation diagnosis of PSA was made. Our case illustrates that a complete physical examination and comprehensive evaluation of the peripheral arterial system of the lower limb including possible persistence of sciatic artery is essential in patients presenting as blue toe before embarking on a surgical or other type of interventional procedure.

KEY WORDS: Sciatic artery, Blue toe, Aneurysm.

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INTRODUCTION

Persistent sciatic artery (PSA) is a rare congenital malformation; originating as a persisting embryologic continuation of the internal iliac artery, the anomaly was first described in 1832 and the 1st report of an aneurysm of this vessel with fatal outcome was published in 1864.¹ In the early embryonic stage, the sciatic artery is the major blood supply for the lower limb bulb and is later replaced by the iliofemoral artery as the limb develops. Its failure to regress, sometimes associated with femoral arterial

hypoplasia, and therefore becoming the dominant inflow to the lower extremity is called PSA.² Several cases reporting persistent sciatic artery has been published up until now, but blue toe has not been reported as the first presentation of this vascular problem. Here in we would like to present a 63 year old woman presenting for the first time with blue toe and on further evaluation diagnosis of PSA was made.

CASE PRESENTATION

A 63 year old woman presented to Firoozgar Hospital, Tehran University of Medical Science, Tehran - Iran. Her complain was pain and discoloration of left toes together with signs and symptoms of sciatic nerve compression. No history of cardiovascular or cerebrovascular disease was present. Vital signs were normal. Other general physical exams revealed no abnormality.

In the lower limb, a pulsatile and tender mass, measuring 5 cm in diameter was palpable in her left gluteal region. There were no signs of inflammatory lesion. There was no history of gluteal injection. Skin discoloration of distal phalanx of her third and fifth toes (Blue toe) was also notable (Figure-1). All pulses were palpable with normal intensity. Clinical and paraclinical evaluation for discovering possible cause of her blue toes were unremarkable.

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Table-I: Different types and subtypes of PSA (Persistent Sciatic Artery).

Type	Subtype	Definition
Type 1		complete PSA in combination with a normal femoral artery
Type 2		complete PSA in combination with an incompletely developed femoral artery
	subtype 2a	SFA is present, but does not reach the popliteal artery (as present in this case)
	subtype 2b	SFA is absent
Type 3		incomplete PSA, in which only the upper part has persisted and the femoral arteries are normally developed
Type 4		incomplete PSA, in which only the lower part has persisted with normally developed femoral arteries
Type 5		PSA originating from the median sacral artery
	Subtype 5a	with a developed SFA
	Subtype 5b	with an undeveloped superficial artery

In order to evaluate her gluteal pulsatile mass, a Computed Tomogram Angiogram (CTA) was done. CTA revealed a persistent sciatic artery and an aneurysm in the proximal part, containing clot within it (Figure.2). With the diagnosis of aneurysm of persistent sciatic artery, the patient referred to endovascular department for therapeutic intervention. She underwent endovascular coil embolization. On one year follow up, she is in good state and No episode of recurrent blue toe.

DISCUSSION

The sciatic artery is the axial artery of the lower extremity, providing blood supply during the early stages of embryonic development. It normally

regresses to form the proximal part of the inferior gluteal artery after the third month of embryologic life, after the development of the femoral artery from the external iliac artery.³ At this time, a part of the sciatic artery involutes and other parts develop into permanent arteries: the proximal part of the sciatic artery gives rise to the inferior and superior gluteal arteries and the distal part of the sciatic artery forms the peroneal and popliteal arteries.⁴ If the femoral system fails to develop, the sciatic artery becomes the dominant supply to the leg and the superficial femoral artery remains hypoplastic. Persistent



Figure-1: Painful discoloration of left 3rd and 5th toes indicating blue toes.

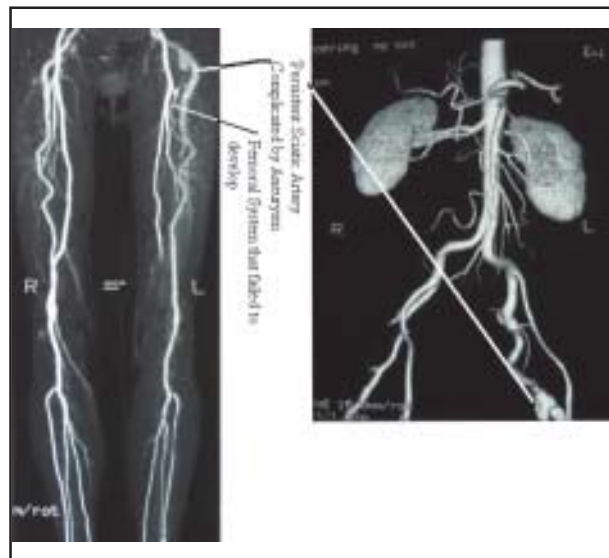


Figure-2: CTA showing the persistent sciatic artery instead of the inferior gluteal artery. An aneurysm in proximal part is present, causing blue toe.

sciatic artery is a rare embryologic anomaly, seen in approximately 0.05% of individuals, and affecting both sexes equally.³

When the sciatic artery persists, it is usually a tortuous and enlarged vessel. In this condition, the internal iliac artery has a larger diameter than the external iliac artery, supplying blood to the lower leg through the PSA. The anatomical position of a PSA differs from the position of the femoral arteries. The sciatic artery starts at the internal iliac artery and runs through the greater sciatic foramen, from where its course is close to the sciatic nerve. In some cases, the sciatic artery actually lies inside the sciatic nerve sheath. Distally, the artery lies deep in the major gluteal muscle and follows a course along the adductor magnus muscle. Finally, the sciatic artery reaches the popliteal artery running through the popliteal fossa, lateral to the insertion of the adductor magnus muscle.⁴

Aneurysm formation in the persistent sciatic artery occurs in as many as 46% of cases, and may be the first evidence of the presence of the anomaly, causing buttock pain and sometimes sciatic nerve compression with sciatic pain in the affected leg.³

Different types of a PSA based on Pillet et al⁵ and Gauffre et al⁶ have been described. (Table-I) PSA has also been classified as complete and incomplete. As presented in this case, complete PSA is the main blood provider to the lower limb. In complete PSA, the superficial artery is mostly hypoplastic and ends in the thigh. The PSA is considered incomplete when the SFA is the main blood provider to the popliteal artery and sciatic artery is usually hypoplastic and terminates in the thigh.⁷

CONCLUSION

Blue toe can be a presentation of different cardiovascular problems. Our case illustrates that a complete physical examination and comprehensive evaluation of the peripheral arterial system of the lower limb, including possible persistence of sciatic artery, is essential in patients presenting as blue toe before embarking on a surgical or other type of interventional procedure.

REFERENCES

1. Baumgartner FJ, Kalinowski A, Grant S. Endovascular repair of injury to a persistent sciatic artery. *Tex Heart Inst J* 2009;36:61-64.
2. Wu HY, Yang YJ, Lai CH, Roan JN, Luo CY, Kan CD. Bilateral persistent sciatic arteries complicated with acute left lower limb ischemia. *J Formos Med Assoc* 2007;106:1038-1042.
3. Uflacker R. Arteries of the Pelvis. In: Uflacker R. *Atlas of Vascular Anatomy: An angiographic approach*. Philadelphia: Lippincott Williams & Wilkins; 2006: 655-698.
4. Mousa A, Rapp Parker A, Emmett MK, AbuRahma A. Endovascular treatment of symptomatic persistent sciatic artery aneurysm: a case report and review of literature. *Vasc Endovascular Surg* 2010;44:312-314.
5. Pillet J, Cronier P, Mercier Ph, Chevalier JM. The ischio popliteal arterial trunk: a report of two cases. *Anat Clin* 1982;3:329-331.
6. Gauffre S, Lasjaunias P, Zerah M. Sciatic artery: a case, review of literature and attempt of systematization. *Surg Radiol Anat* 1994;16:105-109.
7. Bower EB, Smullens SN, Parke WW. Clinical aspect of persistent sciatic artery: report of two cases and review of the literature. *Surgery* 1977;81:588-595.