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Case Report

An unusual case of trifurcation of the sciatic nerve

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ABSTRACT

The sciatic nerve is the largest branch of the sacral plexus. It usually divides at the upper angle of the popliteal fossa. One of its common variations is high division into tibial and common peroneal nerves. Low divisions are rare. Trifurcation of the sciatic nerve is extremely rare. Here, one such unusual type of trifurcation of sciatic nerve has been reported. The sciatic nerve gave an abnormal trunk in addition to the tibial and common peroneal nerves. The abnormal trunk divided into lateral cutaneous nerve of the calf and the peroneal communicating nerve. Since the point of trifurcation was in the middle of the popliteal fossa, it is of clinical and surgical importance. ***Neuroanatomy; 2006; 5: 6–7.***

Key words [sciatic nerve] [abnormal] [trifurcation] [popliteal fossa] [common peroneal nerve]

Introduction

The sciatic nerve, as the largest branch of the sacral plexus, leaves the pelvis through the greater sciatic foramen beneath the piriform muscle. Afterwards, it divides into the tibial and the common peroneal nerves, most frequently at the level of the upper angle of the popliteal fossa. Higher level of the sciatic nerve division is a relatively frequent phenomenon. The tibial nerve gives muscular, genicular and sural branches, whereas the common peroneal nerve gives genicular, lateral cutaneous nerve of the calf and peroneal communicating nerve in the region of popliteal fossa. The sural nerve, peroneal communicating nerve and lateral cutaneous nerve of the calf receive sensations from the posterior and lateral aspects of the leg.

Case Report

During the routine dissection class for medical undergraduates, a trifurcation of the sciatic nerve was noticed. The sciatic nerve terminated in the middle of the popliteal fossa by giving 3 branches. The three branches given were the tibial nerve, common peroneal nerve and an abnormal trunk (Fig 1). The abnormal trunk divided into lateral cutaneous nerve of the calf and peroneal communicating nerve. The common peroneal nerve was reduced in size due to the presence of the abnormal trunk, which was almost as thick as the common peroneal nerve (Fig 1). The sural nerve had a normal size and course. However, the peroneal communicating nerve was unusually thick and coursed down along the lateral side of the leg and joined the sural nerve just above the lateral malleolus, forming a plexus (Fig 2). The plexus formed by the sural and peroneal communicating nerves, supplied the skin of the lower part of the lateral side of the leg and the lateral border of the foot.

Discussion

A number of variations in the course and distribution of the sciatic nerve have been reported. Bifurcation into its two major divisions (common peroneal and tibial) may occur anywhere between the sacral plexus and the lower part of the thigh. The two terminal branches of the sciatic may arise directly from the sacral plexus [1]. When the nerve divides in the pelvis, the common peroneal nerve usually pierces the piriformis muscle. In a recent study, the common peroneal nerve left the pelvis through the piriformis in 2.5% and passed above the piriformis in 1.5% of cases [2]. The cases of entire sciatic nerve passing through the piriformis, resulting in sciatica, have also been reported [3]. A case of tibial nerve passing deep and common peroneal nerve passing superficial to the superior gemellus has been noted [4].

Variations of the sural and peroneal communicating nerves are also seen. The knowledge of these variations is important because the sural nerve is the most frequently used sensory nerve in nerve transplantation. Reports on variations and surgical application of the variations of sural and peroneal communicating nerve are available in literature [5, 6].

The present case of low division and trifurcation of the sciatic nerve may be a boon to surgeons who do the popliteal block for leg surgery, because high divisions of sciatic nerve may lead to failure of popliteal block anesthesia. The thick peroneal communicating nerve in this case is ideal for nerve grafts. Since the division of sciatic nerve is very low, its branches may interfere in knee surgery. Since trifurcation of the sciatic nerve has not been reported hitherto, this report is of extreme importance to surgeons dealing with popliteal aneurysms. The abnormal trunk mentioned here might surprise the surgeons because normally a nerve trunk of that thickness is not expected in the region.

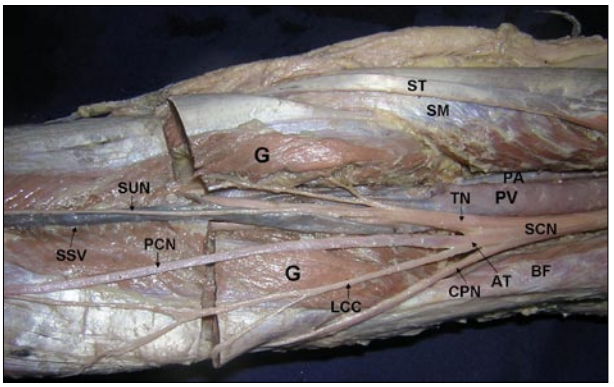

Figure 1. Dissection of the right popliteal fossa showing trifurcation of the sciatic nerve *(**SCN:** sciatic nerve dividing low in the popliteal fossa; **TN:** tibial nerve; **CPN:** common peroneal nerve; **AT:** abnormal trunk; **LCC:** lateral cutaneous nerve of the calf; **PCN:** peroneal communicating nerve; **SUN:** sural nerve; **PV:** popliteal vein; **SSV:** small saphenous vein; **PA:** popliteal artery; **G:** two heads of gastrocnemius muscle; **ST:** semitendinosus; **SM:** semimembranosus; **BF:** biceps femoris)*. Color version of figure is available online.

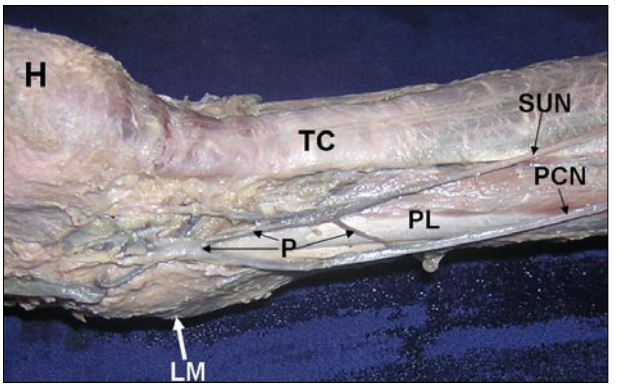

Figure 2. Posteriolateral view of the right leg showing the cutaneous nerves *(**SUN:** sural nerve; **PCN:** peroneal communicating nerve; **P:** plexus formed by sural and peroneal communicating nerves; **H:** heel; **LM:** lateral malleolus; **TC:** tendocalcaneus; **PL:** peroneus longus)*. Color version of figure is available online.

References

[1] **Bergman RA, Afifi AK, Miyauchi R.** Compendium of human anatomical variations. **Baltimore, Urban and Schwarzenberg. 1988; 146.**

[2] **Ugrenovic S, Jovanovic I, Krstic V, Stojanovic V, Vasovic L, Antic S, Pavlovic S.** The level of the sciatic nerve division and its relations to the piriform muscle. **Vojnosanit Pregl. 2005; 62: 45–49.**

[3] **Chen WS.** Bipartite piriformis muscle: an unusual cause of sciatic nerve entrapment. **Pain. 1994; 58: 269–272.**

[4] **Babinski MA, Machado FA, Costa WS.** A rare variation in the high division of the sciatic nerve surrounding the superior gemellus muscle. **Eur. J. Morphol. 2003; 41: 41–42.**

[5] **Mahakkanukrauh P, Chomsung R.** Anatomical variations of the sural nerve. **Clin. Anat. 2002; 15: 263–266.**

[6] **Benjamim AC, Tuma Junior P, Grillo MA, Ferreira MC.** Surgical anatomy of the sural nerve. **Rev. Hosp. Clin. Fac. Med. Sao. Paulo. 1995; 50: 25–29.**