Case Report

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Anomalous Origin of Sural Nerve: A Case Report

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Abstract

Sural nerve normally receives contributions from tibial nerve and common peroneal nerve. In the routine cadaveric educational dissection, sural nerve was seen to be arising from the common peroneal nerve instead of the tibial nerve on both sides. It was arising directly from the common peroneal nerve about 6 cm below the division of the sciatic nerve on right side and 8 cm below the division on left side. But in its rest of the course, it showed a normal branching pattern.

Keywords: Anomaly; Sural nerve; Common Peroneal nerve.

Introduction

The normal structures as well as the variations in the structures of the human body are the areas of great interest especially for the anatomists, physicians and surgeons. Variations of different structures in the extremities are fairly uncommon, but if present, are of great importance for the surgeons to operate or to undertake various surgical procedures related to these structures. Normally sural nerve is formed by contributions from both the tibial nerve (TN-L4, L5, S1,S2, S3) and the common peroneal nerve (CPN-L4,L5,S1,S2) in lower extremity. The branch from the Tibial Nerve, which is often more substantial, is called the medial sural cutaneous nerve (MSCN). The branch from the Common Peroneal Nerve is termed the peroneal communicating branch (PCN).[1] Site of origin of Sural Nerve is highly variable. Most commonly it is formed in middle third of calf of leg. It descends lateral to tendocalcaneus. It proceeds along lateral border of foot.[2] Sural nerve is an entirely cutaneous nerve, except for some unmyelinated autonomic fibers. As it is a sensory nerve, its injury produces trivial sensory deficit. It is used for nerve biopsy.[2] As per Santanu Bhattacharya et al the, Sural Nerve formation is variable in both limbs.[3]

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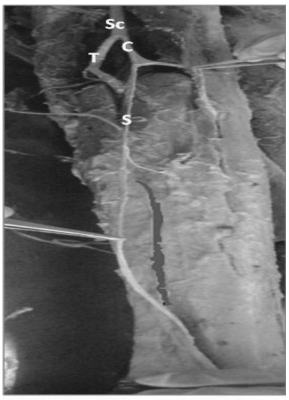
Case Report

In the routine cadaveric educational dissection at the department of Anatomy, SRTR GMC, Ambajogai, a rare variation was detected in the formation of sural nerve in both the lower limbs of a 62 years old male cadaver. In present case Sural nerve showing considerable amount of variation in its origin, course & distribution as well as its relation with other structures.In this case, Sural nerve was arising entirely from common peroneal nerve (L4, L5, S1,S2) in both the limbs, with no contribution from the tibial nerve. It was arising directly from the common peroneal nerve, about 6 cm below the division of the sciatic nerve on right side and 8 cm below the division on left side. It then descended lateral to tendocalcaneus, lying close to small



Dissected Right Limb

saphenous vein, between lateral malleolus and tendocalcaneus. In our case the Sural Nerve was formed little above the middle of the popliteal fossa on both the sides. Then it proceeded along lateral border of foot. The nerve was supplying skin of the posterior lateral corner of the leg, and the lateral foot and 5th toe. And in its further course, it showed a normal branching pattern and normal cutaneous distribution.

Abbreviations:

- T-Tibial nerve
- C-Common Peroneal Nerve
- S-Sural nerve
- Sc-Sciatic nerve

Discussion

The pattern of formation of the Sural Nerve has been broadly divided into three types A, B and C by Huelke depending on contribution from tibial nerve and common peroneal nerve.[4]

Type A - anastomotic type, Type B – nonastomotic type, Type C - nonastomotic type

Abbreviations

CPN – Common peroneal nerve, TN- Tibial nerve, ScN-Sciatic nerve, MSCN- Medial sural cutaneous nerve, PCN- Peroneal communicating nerve, SN-Sural nerve

Other nerves that also contribute are- Lateral cutaneous nerve of the calf, the posterior cutaneous nerve of the thigh In the present case, type C was seen on both sides. Types A and B are much more common as compared to type C. The incidence of type C varies from 0% to 14% in various studies conducted throughout the world like USA, Japan, and Korea. These differences may be due to genetic variations in different races, wide variation in the sample size of the studies that have been conducted. No large studies have been conducted in Indian populations so far. The type A pattern of formation is most often bilaterally present in about 67% cases.[5] Type C pattern is commonly unilateral and is usually combined with another pattern on the opposite side.

According to some authors, CFN gives rise to two cutaneous branches, often from a common trunk –they are lateral sural nerve and sural communicating nerve (SCN). According to some authors, SCN is also called LSCN.[6,7] As per Pyon S B et al, Sural nerve was a direct continuation of the MSCN in four (15.4%) cases, and there was no communication between the MSCN and LSCN in two cases (7.7%).[8,9] The MSCN, which arises from TN, did not involve in the formation of SN [10] The point of joining of the Medial

Sural Cutaneous Nerve and the Peroneal Communicating Nerve to form the Sural Nerve is highly variable. The most common site of formation appears to be the middle third of the calf.[2] Various studies, have revealed that the site of formation of the Sural Nerve in the upper fourth of the leg occurs in between 3 to 24.3% of cases.[11] In our case the Sural Nerve was formed little above the middle of the popliteal fossa on both the sides.

The relative contributions of the Medial Sural Cutaneous Nerve and the Peroneal Communicating Nerve have been studied in livings subjects using nerve conduction methods.[7] The contribution from the Medial Sural Cutaneous Nerve is usually larger as compared to the Peroneal Communicating Nerve.

Conclusion

We report a rare case of bilateral variation in the origin of sural nerve, which arise as a branch from common peroneal nerve and did not receive any contribution from medial sural cutaneous nerve, a branch of tibial nerve. The peroneal communicating branch can be of substantial caliber and may be useful as a source of nerve graft without complete sacrifice of the sural nerve.[12] This finding is of great significance. Since sural nerve is widely used in biopsy and as autograft in peripheral nerve transplantation, as well as in other procedures, awareness about variation in the formation and course of nerve has immense value to the clinicians.[7] Clinically, SN is used in sensory nerve grafting for therapeutic purposes because of its long course; it is also used in nerve conduction velocity studies for diagnostic purpose.[11]

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