

Variation in the Formation of Sural Nerve –A Case Report

Case Report

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Abstract

Sural nerve is a sensory nerve, which supplies the skin of the posterolateral aspect of the distal third of leg, lateral malleolus, along the lateral side of foot and little toe. The sural nerve's anatomy is broadly studied in man, because it is one of the most frequently used sensory nerves in transplantation. The aim of the paper is to present a case of variant formation of the sural nerve and review of literature related to this case. Here is an unusual type of formation of sural nerve is reported. In this case, the medial sural cutaneous nerve and lateral sural cutaneous nerve were noticed to continue their course without any formation of a unique nerve trunk on the posterior side of left leg of 50 year old male cadaver. A transverse communicating branch connecting these two nerves was present. As the sural nerve is of significant diagnostic and therapeutic importance, detailed knowledge of the sural nerve's anatomy and its contributing nerve is also of great importance.

Key Words: Human Cadaver, Sural Nerve, Lateral Sural Cutaneous Nerve, Medial Sural Cutaneous Nerve, Tibial Nerve, Common Peroneal Nerve.

Introduction

The sural nerve is one of the cutaneous nerve of lower limb, formed by communication of medial sural cutaneous branch, that arise from the tibial nerve and lateral sural cutaneous nerve or sural communicating branch, a branch directly from common peroneal nerve(1). The sural nerve descends lateral to the calcaneal tendon, near the short saphenous vein, to the region between the lateral malleolus and the calcaneus and supplies the posterior and lateral skin of the distal third of the leg. It then passes distal to the

lateral malleolus along the lateral side of the foot and the little toe, supplying the overlying skin (2).

Case Report

During routine dissection of postgraduates in the Department of Anatomy, N.K.J. Ayurvedic Medical College and P.G. Centre Bidar, the variant formation of sural nerve was found in the left leg of the 50 year old male cadaver. In this case, the medial sural cutaneous nerve and lateral sural cutaneous nerve, after respectively deriving from the tibial and common fibular nerve, were noticed to continue their course without any formation of a unique nerve trunk on the posterior side of left leg. A transverse communicating branch connecting these two nerves, was present about 10 cm above the lateral malleolus. Both the branches continue their course in the foot separately on the lateral side of the foot and little toe supply the overlying skin.

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Both the nerves were normal in their size and course and gave out their respective other branches in normal way.

Fig 1 : Showing normal course of Sural nerve in the right limb of the male cadaver.

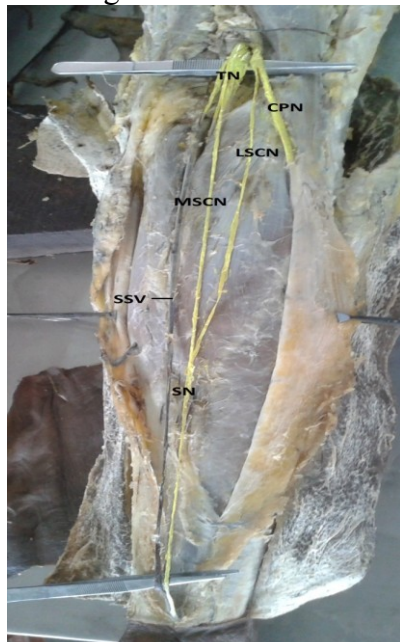
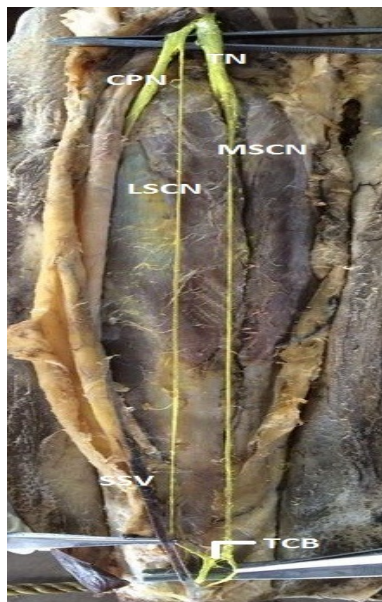


Fig 2 : Shows variation in the formation of sural nerve in left limb of the male cadaver.



(TN – Tibial nerve , CPN – Common peroneal nerve, MSCN – Medial sural cutaneous nerve, LSCN – Lateral sural cutaneous nerve, SSV – Short saphenous vein, SN – Sural nerve, TCB – Transverse

communicating branch)

Discussion

According to the classical textbooks of anatomy, in the midline of popliteal fossa, the medial sural cutaneous nerve emerges from the tibial nerve, runs between the two heads of the gastrocnemius and pierces the posterior deep fascia of the leg at variable distance. The lateral sural cutaneous nerve arises from the common peroneal nerve near the head of fibula, crosses the lateral head from lateral to medial to join the medial sural cutaneous nerve, and form the sural nerve.

Occasionally, the sural nerve is not formed by the union of normal terminal branches of sciatic nerve. Instead, the medial sural cutaneous nerve from tibial nerve may continue as sural nerve which supplies the lateral surface of the leg, gives off the lateral branches to the heel and continue as lateral dorsal cutaneous nerve(3). But in our case report, the medial sural cutaneous nerve and lateral sural cutaneous nerve continued their course separately without formation of a unique nerve trunk i.e sural nerve is not formed. In these people, the skin normally innervated by the sural nerve is supplied by the medial and lateral sural cutaneous branches. The sural nerve accompanies the small saphenous vein and enters the foot posterior to the lateral malleolus to supply the ankle joint and skin along the lateral margin of the foot(4).

According to a study of the sural nerve, authors reported that in 80% of the cases it was formed by the union of the MSCN and LSCN, and in 20% of the cases it was a direct continuation of the MSCN (5). Furthermore, a study showed that the SN was formed by the union of the MSCN and the LSCN in 67.1% of cases and then it was a continuation of the MSCN alone in 32.2% of cases(6). But no such study has been done till now which shows percentage of such type of variation of sural nerve.

Clinically, the sural nerve 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 purposes. The sural nerve is usually recognized by the surgeons as a site for harvesting an autologous nerve graft and for nerve biopsies in case of neuropathies as it is superficial, readily accessible and largely sensory(7). Sural nerve grafts are used to restore the muscle tone in fascial nerve palsy.

Pieces of sural nerve are often used for nerve grafts in procedures such as repairing nerve defects resulting from wounds and located by surgeons in relation to the small saphenous vein. Because of variations in the level of formation of sural nerve, the surgeons may have to perform incisions in both the legs and then select the better specimen(8). Clinically, the SN is widely used for both diagnostic (biopsy and nerve conduction velocity studies) and therapeutic purposes (nerve grafting). Thus, a detailed knowledge of the anatomy of the SN and its contributing nerves are important in carrying out these and other procedures.

Conclusion

The variation of Sural nerve is an important surgical consideration when it is used as an autograft for peripheral nerve reconstruction. The knowledge of kind of entrapment of Sural nerve is very important in plastic surgery, sports

medicine, physical therapy, clinical and surgical procedures. So information regarding such variations is helpful for planning operative approaches that minimize the risk of sural nerve injury.

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