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Hashim M.

VARIANT ANATOMY OF THE HUMANS SCIATIC NERVE

Tutor: PhD, associate professor Pasiuk H.A.
Department of Normal Anatomy
Belarussian State Medical University, Minsk

The Sciatic Nerve (SN), also called the ischiadic nerve, is the largest branch of the sacral plexus and runs alongside the hip joint and down the lower limb. SN is the longest and widest single nerve in the human body, going from the top of the leg to the foot on the posterior aspect. This nerve provides the connection to the nervous system for the skin (sensory) of the lateral leg and the whole foot, motor to the muscles of the back of the thigh, and the leg and foot. It contains fibers from both the anterior and posterior divisions of the lumbosacral plexus.

In humans, the sciatic nerve is formed from the L4 to S3 segments of the sacral plexus. The lumbosacral trunk from the L4 and L5 roots descends between the sacral promontory and ala and the S1 to S3 roots emerge from the ventral sacral foramina. These nerve roots unite to form a single nerve in front of the piriformis muscle. The nerve passes beneath piriformis and through the greater sciatic foramen, exiting the pelvis. From here, it travels down the posterior thigh to the popliteal fossa. The nerve travels in the posterior compartment of the thigh behind (superficial to) the adductor magnus muscle, and is itself in front of (deep to) the long head of the biceps femoris muscle. At the popliteal fossa, the nerve divides into its two branches. An interesting point to note here is that within the trunk of the sciatic nerve, fibers composing the tibial and the common peroneal nerves do not mix. In popliteal fossa sciatic nerve divide into two branches: tibial and common fibular nerves.

It is known that the SN is characterized by variability in the level of division, exit, course, relationship to piriformis and variations in the branching pattern.

There are a 16,4% humans with sciatic neuromuscular variants and 33,6% with piriformis muscle asymmetry.

The sciatic neuromuscular variants were categorized using the Beaton and Anson Classification system. In type A, the undivided sciatic nerve exits below the piriformis muscle. In type B, the common peroneal division exits through the piriformis muscle and the tibial division exits below the piriformis muscle. In type C, the common peroneal division exits above the piriformis muscle and the tibial division exits below the piriformis muscle. In type D, the undivided sciatic nerve exits through the piriformis muscle. In type E, the common peroneal division exits above the piriformis muscle and tibial division exits through the piriformis muscle. In type F, the undivided sciatic nerve exits above the piriformis muscle.

The piriformis muscles ranged in size from 0.8 to 3.2 cm, with an average size of 1.9 cm. 19% of patients had greater than 3 mm of asymmetry in the size of the piriformis muscle, with a maximum asymmetry of 8 mm.

As already mentioned, the division of the SN may occur at any level between its origin in the gluteal region and the popliteal fossa. The most common division of SN occur in popliteal fossa. High division of SN was noted in 8% cases, of which 2% cases presented high division in the back of thigh, while 6% cases showed high division within the pelvis.

Knowledge regarding the variation in the SN anatomy and topography is of utmost importance in order to prevent inadvertent injury to the nerve during various surgical procedures.