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High Division of Sciatic Nerve - A Case Report

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ABSTRACT

The Sciatic nerve is the largest nerve in the body. It is formed in the lesser pelvis by anterior primary root of L4 to S3 nerve roots. The nerve leaves the pelvis by passing through greater sciatic foramen, below the piriformis muscle and runs in the posterior aspect of thigh. Then it divides into Tibial nerve and Common peroneal nerve at the superior angle of popliteal fossa.

During our routine dissection, in the dissection hall of SDM college of Ayurveda & Hospital, Udupi, in a 55 year old male cadaver, variation in the division of sciatic nerve at higher level below the level of piriformis muscle was observed. The knowledge of variations in high division of sciatic nerve in gluteal region such as above are very important for surgeons and anaesthetists as this is the area of frequent surgical manipulation. This high division may result in sciatic nerve injury during deep intramuscular injections in gluteal region, failed popliteal block and injury during posterior hip operation.

KEYWORDS

Sciatic nerve, Tibial nerve, Common peroneal nerve, Popliteal block



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INTRODUCTION

Sciatic nerve is the widest nerve of body, about 2cm broad and consists of tibial and common peroneal components, both of which form initially a common trunk. The tibial component is derived from the ventral branches of the anterior primary rami of L₄, L₅, S₁, S₂ and S₃ and the common peroneal component from the dorsal branches of the anterior primary rami of L₄, L₅, S₁, and S₂.

The sciatic nerve emerges through the greater sciatic foramen below the piriformis muscle and curving inferio-laterally descends beneath the gluteus maximus midway between the ischial tuberosity and the greater trochanter. In the gluteal region it rests successively on the dorsal surface of the body of ischium separated from the nerve to quadratus femoris, triscipital tendon of obturator internus with gemellus superior and inferior, quadratus femoris and adductor magnus. At the back of thigh the nerve is crossed by the long head of biceps femoris, and close to the superior angle of popliteal fossa it divides into tibial and common peroneal nerves.

The sciatic nerve may be injured by penetrating wounds, in posterior dislocation or fracture - dislocation of the hip. When the injury is complete, all the muscles below the knee are paralysed associated with foot

drop and all cutaneous sensation below the knee are lost except the area supplied by the saphenous nerve¹.

AIMS AND OBJECTIVES

To illustrate variation in the branching pattern of Sciatic nerve and to study its consequences.

MATERIALS AND METHODS

One male cadaver of 55 year old was dissected in the dissection hall of SDM college of Ayurveda & Hospital, Udupi.

CASE REPORT

During our routine dissection, in the dissection hall of SDM college of Ayurveda & Hospital, Udupi, in a 55 year old male cadaver, exhibited variation in the division of Sciatic nerve.

The sciatic nerve was found to be divided into tibial and common peroneal nerves at a higher level i.e. below the level of piriformis muscle (as shown in Fig 1). The nerve was seen descending deep to gluteus maximus midway between the ischial tuberosity and the greater trochanter and its further course was normal.



Fig 1 Tibial nerve (TN) and Common peroneal nerve (CPN), Piriformis muscle

DISCUSSION

Sciatic nerve may divide into tibial and common peroneal nerves anywhere from its origin in the pelvic region until the popliteal fossa. There are many case studies regarding varied division of sciatic nerve.

Many authors have attempted classification of high divisions of sciatic nerve. There are six different types of higher divisions which was observed in previous studies of different researchers. Beaton & Anson classified variations of the piriformis and SN in 120 specimens in 1937 and in 240 specimens in 1938. Their classification, known as the Beaton & Anson classification, is as follows^{2,3}

Type 1: Undivided nerve below undivided muscle

Type 2: Division of nerve between and below undivided muscle

Type.3: Division above and below undivided muscle

Type 4: Undivided nerve between heads

Type 5: Division between and above heads

Type 6: Undivided nerve above undivided muscle

In this case, the sciatic nerve was found to be divided into tibial and common peroneal nerves at a higher level i.e., below the level of piriformis muscle which belong to type 1 as per above classification. The course of the nerve was found to be normal i.e., it was seen descending deep to gluteus maximus midway between the ischial tuberosity and the greater trochanter as usual.

One of the consequences of high division of sciatic nerve is that it leads to failure of popliteal block anaesthesia. During surgeries of foot and ankle region, sciatic nerve block is done for anaesthesia. The needle insertion point is 7cm above the popliteal fossa crease at the midpoint between the two tendons. High division may mislead the nerve as the sciatic nerve generally divides at superior angle of the popliteal fossa⁴. Also this high division results in sciatic nerve injury during deep intramuscular injections in gluteal region and also injury during posterior hip operation.

CONCLUSION

The anatomical knowledge regarding variation about the level of division of the sciatic nerve and the location where it leaves the pelvis is of great importance. The high division of sciatic nerve presented in this case may misguide in sciatic nerve block and other surgery. Thus knowledge of such variation may be helpful to surgeons, anaesthetist and clinicians for the purpose of anaesthesia and surgery.

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