



Study on Variations of the Sciatic Nerve in Relation to Piriformis

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ABSTRACT

Sciatic nerve is the large branch of sacral plexus .It is the important content of the gluteal region and passes through greater sciatic notch below the piriformis .It provides motor innervation to hamstring group of muscles and sensory and motor innervation to leg &foot.Variations in its emergence in relation to the piriformis may compress the nerve leading to piriformis syndrome. The present study was done on 40 lower limbs that showed higher division of sciatic nerve and variations in the emergence of the nerve in relation to piriformis.Various patterns in the emergence of sciatic nerve in relation to piriformis was reported and these variations may compress the sciatic nerve and may cause incomplete nerve block during popliteal blocks..

1. Introduction

Sciatic nerve (SN)is the thickest nerve of the body.It supplies the back of the thigh and through its branches it supplies the all compartments of leg and foot.It is a branch of lumbosacral plexuses with the root value of L4,L5,S1,S2&S3.After its formation it enters the gluteal region passing through greater sciatic notch below the Piriformis for its innervation.At the superior angle of popliteal fossa it divides into tibial nerve(TN) and common peroneal nerve(CPN).These branches provides sensory and motor branches to the leg and foot.Variations in the division pattern of sciatic nerve and its emergence in relation to the piriformis muscle is of great importance as it can cause nerve compression leading to piriformis syndrome,one of the causes of non discogenic sciatica .Higher division of sciatic nerve leads to incomplete nerve blocks.The present study found two variations in the emergence of sciatic nerve in relation to piriformis muscle.

2Materials & Methods

The study was conducted in the department of Anatomy on 40 lower limbs of destitute cadavers that were used for teaching and training programme of undergraduate 1st MBBS Medical students. During the dissection of gluteal region,the gluteal muscles were exposed along with their nerve supply.The gluteus maximus was cut and separated to study the structures under its cover. During this process variation in the emergence of sciatic nerve in relation to piriformis was observed in 6 limbs.

3 Observations

In this study it was observed that most of the specimens had normal course and branching pattern of sciatic nerve. The sciatic nerve emerged below the piriformis and it gave its muscular branches to back of thigh and in the popliteal fossa it divided into tibial nerve and common personal nerve. Variations in the entry of sciatic nerve into the gluteal region in relation to piriformis were observed in six limbs .

In 2 right and1 left lower limbs , sciatic nerve entered the gluteal region in the form of two branches that were passing above and below the

pyriformis. They were Common peroneal nerve above and tibial nerve below the pyriformis. (fig.1)

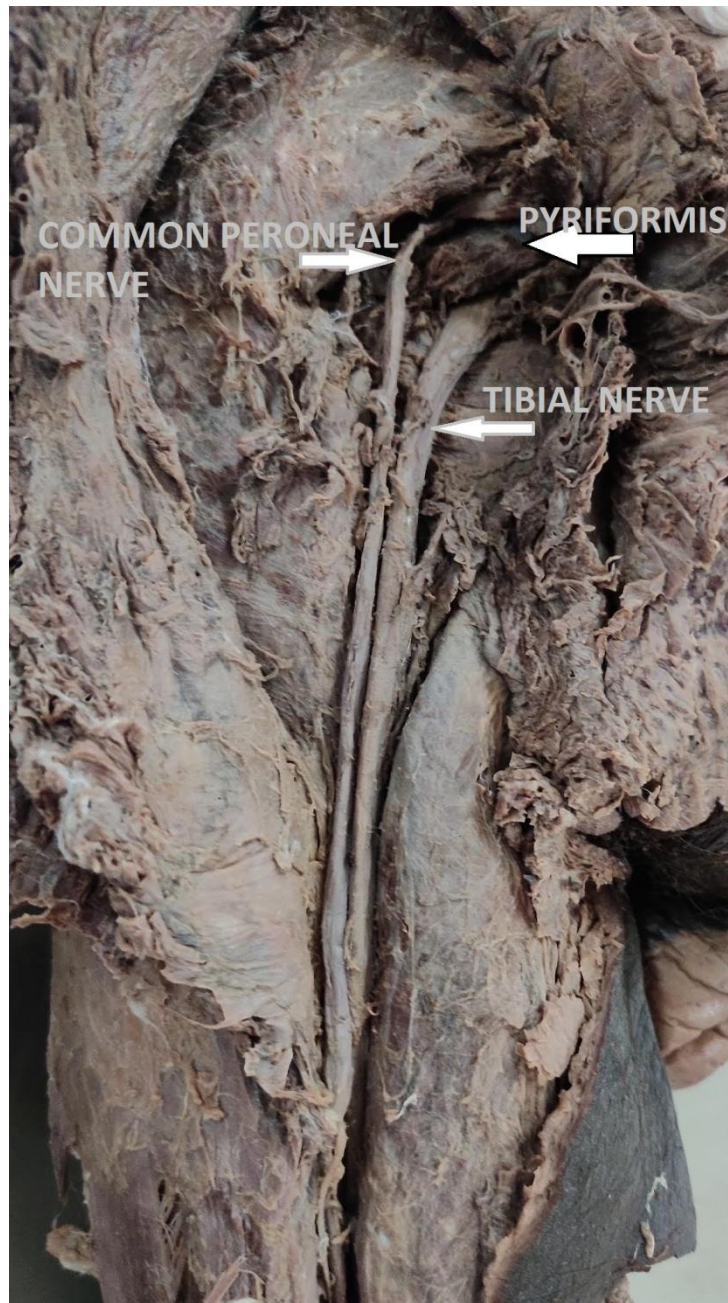


Fig.1 Divisions of sciatic nerve above & below pyriformis

Division of sciatic nerve in the gluteal region was observed in two left and 1 right lower limbs. The sciatic nerve gave its two divisions immediately after entering the gluteal region below the pyriformis. (fig.2)

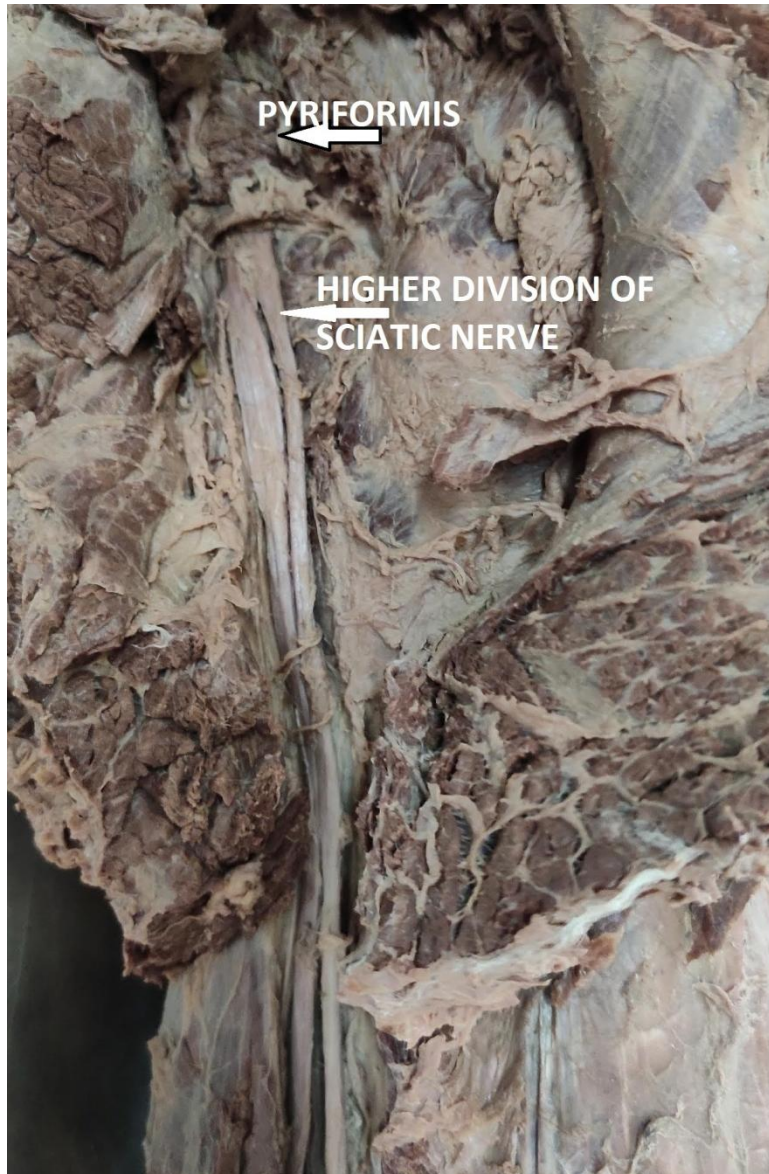


Fig.2 Division of sciatic nerve below the piriformis.

4 Discussion:

Sciatic nerve is the branch of sacral plexus with a root value of L4,L5,S1,S2,S3,S4.After its formation it enters the gluteal region below piriformis muscle .Its gives its two terminal divisions in the popliteal fossa at the lower third of back of thigh.Beaton and Anson have classified the relationship of sciatic nerve to the Piriformis muscle in 120 specimens in 1937 and 240 specimens in 1948 into six types. (1,2)

Type 1: Undivided nerve below undivided muscle.

Type 2: Divisions of nerve between and below undivided muscle.

Type 3: Divisions above and below undivided muscle.

Type 4: Undivided nerve between heads.

Type 5: Divisions between and above heads.

Type 6: Undivided nerve above undivided muscle.

Pokorny et al. study on 91 fresh cadavers stated that the first variation of Beaton which is undivided nerve below undivided muscle was the most common type(3).

Ugrenovic et al., found high division of the sciatic nerve either in the posterior femoral region or in the gluteal region in 27.5% of the specimens in a cadaveric study in 2005 performed on 100 fetuses.(4) Shivaji et al in their study on 60 lowerlimbs found higher divisions of sciatic nerve One variation with the two components of sciatic nerve passing below the piriformis and in another the two components passing above and below piriformis. (5)

Machado et al dissections on 100 fetuses reported three types of variations,
 Type-1 CPN penetrated the piriformis and the TN passed under the piriformis
 Type-2 the CFN passed above the piriformis and the TN passed under the piriformis
 Type -3 the SN penetrated the piriformis (6)

The close relationship between the SN and the piriformis may compress the SN and cause the piriformis syndrome Piriformis syndrome not only occurs due to piriformis hypertrophy, inflammation or irritation, but also may be caused by congenital variations of the piriformis and the SN.(7) Higher division of sciatic nerve may cause an incomplete sciatic nerve block during the popliteal block anaesthesia.(4)

5 Conclusion

Sciatic nerve is a large branch of sacral plexus that supplies the muscles of back of thigh and muscles of leg through its branches. It enters the gluteal region through greater sciatic notch below piriformis. Variant patterns of emergence of sciatic nerve in the gluteal region in relation to piriformis cause piriformis syndrome, a nondiscogenic cause of sciatica.

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