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Case report

BILATERAL VARIANT OF SCIATIC NERVE EXHIBITING INTRA-PELVIC DIVISION

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ABSTRACT

Context (background): In case of high division of the sciatic nerve in the pelvis its, common peroneal component may pierce the Piriformis muscle. This anatomical variant can explain many clinical findings. Aims: Its objective is to report a case of high division of the sciatic nerve in order to contribute towards better anatomical understanding of the gluteal region. Methods and Material: Routine undergraduate dissection of a male cadaver revealed bilateral variation in sciatic nerve. Results: Sciatic nerve is dividing into tibial and common peroneal components in the pelvis. Common peroneal component is piercing through the piriformis muscle. Tibial component is emerging between piriformis and superior gemelli muscle. Conclusions: Sciatic nerve variation can lead to a Piriformis muscle syndrome, inadvertent injury during operations in the gluteal region, failure of sciatic nerve block and/or sciatic neuropathy. The differences in routes of these two nerve components can explain them.

Keywords: Common peroneal nerve, Piriformis muscle, Piriformis syndrome, Sciatic nerve.

INTRODUCTION

The sciatic is the thickest and longest nerve in the human body. Normally, Sciatic nerve leaves the pelvic cavity as a single trunk through greater sciatic foramina to emerge between piriformis and superior gemelli muscle.¹ Variation in the course of sciatic nerve may or may not be accompanied by a variation in the piriformis muscle.² In this case report, we want to present a case of the bilateral high division of the sciatic nerve. The common peroneal component is piercing the piriformis muscle. The variation has clinical application in case of non-discogenic sciatica or piriformis syndrome.^{3, 4} It is also a cause for coccygodynia and pain in hip, groin and buttock.^{4, 5} The variation can lead to post-operative nerve entrapment after total hip arthroplasty.⁶ The same being the cause of failure of nerve block to relieve the pain.⁷

CASE REPORT

During routine undergraduate dissection, at Dept of Anatomy, Sree Mookambika Institute of Medical Sciences, Kulasekharam, Tamilnadu the variation was noticed. A formalin-fixed male cadaver aged 60 years whose case history and cause of death is not known was dissected. Exposure of the gluteal region was done following classical incision and dissection procedures. After skin incision and removal of panniculus adiposus, gluteus maximus was resected as directed in dissection manual to expose the structures under cover of it. The variation was noticed on both sides. All arteries and nerves were dissected and identified. The same procedure was followed on both the sides. Ethics: The procedures followed were in accordance with ethical standards of handling of cadaver for learning and teaching.

In this case the High division of sciatic nerve has occurred in the pelvis. At the greater sciatic foramina,

tibial component is emerging below the piriformis where as common peroneal component is noted to pierce the piriformis as it leave the pelvis to reach gluteal region. The branches of sciatic did not reunite in the gluteal or thigh region. The muscular branches from the tibial component to the hamstring muscles are seen arising from the tibial nerve. The course, branches and relations of both nerves in the popliteal fossa and leg were normal. The piriformis muscle had a single muscle belly just splitting to allow passage of common peroneal nerve. (Fig. 1)

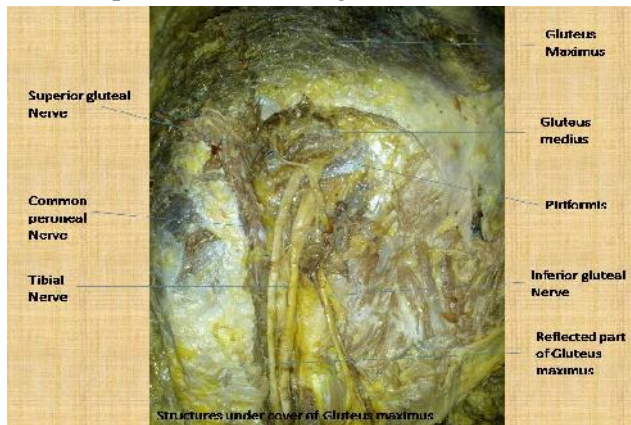


Fig. 1: structures under cover of Gluteus Maximus

DISCUSSION AND CONCLUSION

In the anatomy books sciatic nerve is described as a major nerve from the lumbo-sacral plexus. It is formed in the pelvis and emerges at the superior border of the piriformis. It has two components. It's tibial component supply to the hamstrings and the common peroneal to the short head of biceps femoris in the thigh. The nerve normally divides into these two terminal branches; tibial and common peroneal at the upper angle of the popliteal fossa. In the popliteal fossa the common peroneal nerve is lateral to the tibial nerve. In the upper 1/3rd the tibial nerve is lateral to popliteal vein and artery.¹ Beaton and Anson have studied 360 specimens and classified relations of sciatic nerve or its divisions to the piriformis muscle into six types. 1- Undivided nerve below undivided muscle; 2- Divisions of nerve between and below undivided muscle; 3- Divisions above and below undivided muscle; 4- Undivided nerve between heads; 5- Divisions between and above heads; and 6- Undivided nerve above undivided muscle.^{2, 4} The present case belongs to Type 2. (Fig. 1)

The variations of sciatic nerve are reported in different races and populations with a variable frequency.⁸⁻¹² The relationship between sciatic nerve and the piriformis

muscle explain the anatomical basis of the origin of signs and symptoms of nerve compression. In this case it is known as 'Piriformis muscle syndrome'.³ It is characterized by sensitivity, motor and trophic disturbances in the region of distribution of trapped component of the sciatic nerve.³⁻⁵ The sciatic nerve is also subject to direct injury, compression, and ischemia. Total hip arthroplasty may involve excessive distraction of sciatic nerve, hematoma formation, and dislocation of bony component and prominence of implanted unit. Any or all of them can lead to sciatic nerve injury.⁶

Sciatic nerve entrapment can lead to pain similar in distribution and nature like sciatica. Nerve irritation can be due to contraction or myospasm of piriformis. Ultrasonography, perineurography by Computerised Tomography and Magnetic Resonance Imaging can help to distinguish between two and planning of intervention.^{13,14} Resection, division or thinning of piriformis may help to release entrapped nerve.^{15, 16} The role of lateral rotation will be managed by obturator internus, superior and inferior gemelli and quadrates femoris. Non- surgical management of pain in Piriformis syndrome includes injecting any one of these or combination of local anesthetic, steroid, botulinum toxin and stored in the area of the sciatic nerve in the gluteal region. A guided procedure under electromyography (piriformis), nerve stimulator (sciatic nerve) or other imaging techniques will yield better results than a blind one.^{7, 13, 14} Other conditions which mimic the presentation are endometriosis, myofascial pain syndrome, pelvic tumor, spinal stenosis, and trochanteric bursitis.

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