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A RARE VARIATION IN THE INNERVATION OF GLUTEUS MAXIMUS MUSCLE – A CASE REPORT.

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ABSTRACT

Gluteus maximus is the largest and most superficial of the three gluteal muscles. The inferior gluteal nerve arises from the ventral divisions of the fifth lumbar and first and second sacral nerves that innervate the gluteus maximus muscle. The present report describes a rare variation in the innervation of gluteus maximus muscle. In addition to inferior gluteal nerve the gluteus maximus muscle is also supplied by a branch from sciatic nerve. Posterior femoral cutaneous nerve, two in number lies medial to the sciatic nerve, formed a plexus under the Gluteus maximus muscle and divided into its terminal branches. Gluteal branches of posterior femoral cutaneous nerve pierce the gluteus maximus muscle instead of curl around its lower border. To the best of our knowledge, there is no literature describing this kind of variation. Precise knowledge of variations of this report may help to plan a surgery in gluteal region, traumatology of the Hip joint, Hip Dislocation and total hip replacement surgery. In such case of variation in the innervation of gluteus maximus muscle causes sciatic nerve damage even during intra-muscular injections.

Keyword: gluteus maximus, inferior gluteal nerve, sciatic nerve

1. INTRODUCTION

Background

The gluteus maximus muscle originates from outer surface of ilium, posterior surface of sacrum and coccyx and sacrotuberous ligament. The inferior gluteal nerve is a branch of the sacral plexus that innervates the gluteus maximus muscle. The inferior gluteal nerve arises from the dorsal divisions of the fifth lumbar and first and second sacral ventral rami. It leaves the pelvis through the greater sciatic notch below the piriformis muscle and divides into branches that pass posteriorly into the deep surface of the gluteus maximus muscle. The sciatic nerve is the thickest nerve in the body. It begins in the pelvis and terminates at the superior angle of the popliteal fossa by dividing into the tibial and common peroneal nerves.



Case Presentation

During routine educational dissection for medical undergraduates, we observed a variation in the **innervation of gluteus maximus muscle** in left lower limb of middle aged Indian male cadaver. **In addition to** inferior gluteal nerve the **gluteus maximus muscle is also supplied by a branch from sciatic nerve**. Posterior femoral cutaneous nerve, two in number which lies medial to the sciatic nerve, formed a plexus under the gluteus maximus muscle and divided into its terminal branches. Gluteal branches of posterior femoral cutaneous nerve pierce the gluteus maximus muscle instead of curling around its lower border.

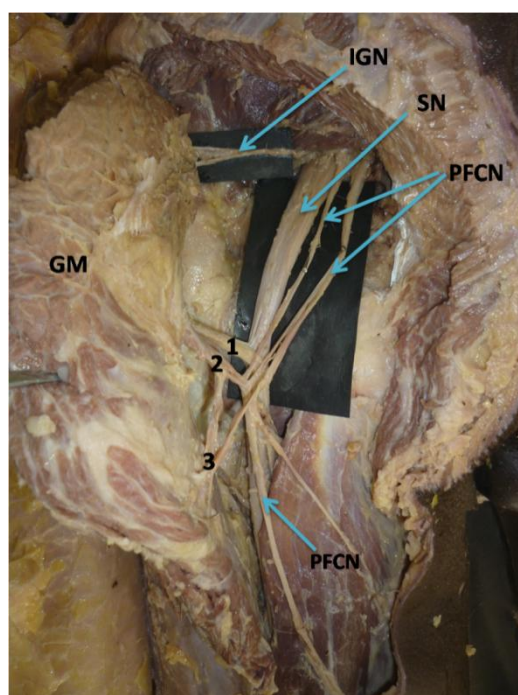


Figure 1. Photograph of the left gluteal region showing **GM** - Gluteus maximus muscle, **IGN** - inferior gluteal nerve, **SN** - sciatic nerve, **PFCN** - posterior femoral cutaneous nerve **1**- Branch of sciatic nerve supplying Gluteus maximus muscle, **2, 3** - Gluteal branches of posterior femoral cutaneous nerve piercing the Gluteus maximus muscle.

2. DISCUSSION

During development, the nerves contributing to the lower limb form two plexuses (lumbar and sacral) at the base of the limb bud. Later, as the elements from each of these plexuses grow out into the limb, they are subdivided into dorsal and ventral components, for the dorsal and ventral musculatures. The sciatic nerve is formed by the ventral component (tibial nerve) and the large dorsal component¹ of the sacral plexus (common fibular nerve).¹ Jaijesh et al reported a case of bilateral high division of sciatic nerve with a variant inferior gluteal nerve which supplies the gluteus maximus muscle². Various studies have reported on the level of sciatic nerve division into tibial and common peroneal nerves³. However, this type of variation in the innervations of gluteus maximus muscle is rare and not been reported in the literature. Piriformis syndrome is a rare pain-generating condition, and only detailed study of sciatic nerve anatomy and its anatomical relationship with the piriformis muscle is likely to shed light on the questions regarding the syndrome. Anatomical variations in the relationship between the sciatic nerve and the piriformis muscle do not seem to be solely responsible for the piriformis syndrome⁴.



3. CONCLUSION

Anatomical variations in gluteal region such as above are very important for surgeons, as this is the area of frequent surgical manipulation. A thorough knowledge of different variations will not only help surgeons to be careful, but plan accordingly during various surgical interventions and management of this region⁵. Knowledge of this kind of variation also motivates radiologist to repeat MRI on other side, as there can be differences on two sides. This knowledge is also very important for nurses and junior doctors to prevent deep intramuscular injection hazards in gluteal region⁶.

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