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## Case report

### VARIATIONS IN THE INNERVATIONS TO THE GLUTEUS MAXIMUS MUSCLE: A CASE REPORT

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## ABSTRACT

Gluteus Maximus is the largest and superficial muscle in the gluteal region. Rhomboidal in outline, possesses coarse muscle fasciculi. Supplied by inferior gluteal nerve, a branch from the sacral plexus. During routine dissection for undergraduate medical students, we observed, a branch from sciatic nerve, which supplied the gluteus maximus muscle. It's rare variation. Knowledge of such variations may be useful for surgeons.

**Keywords:** Gluteus Maximus, Inferior gluteal nerve, Nerve supply, Origin.

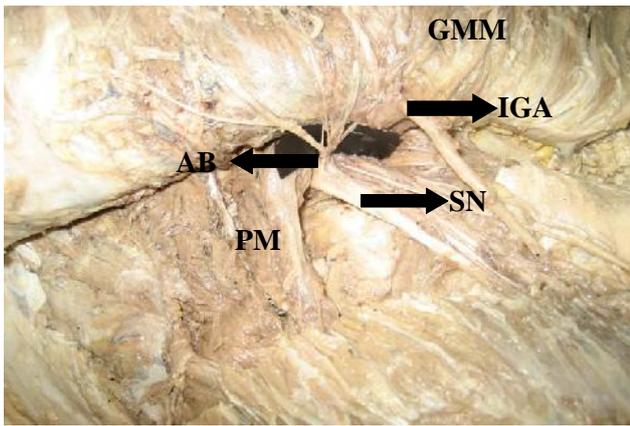
## INTRODUCTION

The gluteal region is an important anatomical and clinical area which contains muscles and vital neurovascular bundles. They are important for clinical and morphological reasons.<sup>1</sup> Gluteus Maximus is the largest and most superficial muscle in the gluteal region. It is broad, thick quadrilateral mass, which, with its overlying adipose tissue forms the buttock. Gluteus maximus is thicker and more extensive in man than any non-human primate, developments that are associated with the evolutionary transition to bipedality and a permanently upright posture. The muscle has a coarse fascicular architecture, with large bundles of fibres separated by fibrous septa. It arises from the posterior gluteal line of ileum, rough area of bone, including the crest above and behind it, from the aponeurosis of Erector spine, dorsal surface of the lower part of sacrum, side of coccyx, the sacrotuberous ligament, and from the gluteal aponeurosis. Most of the fibres get inserted to the iliotibial tract of fasciae latae and deep fibres of the lower part of muscle inserted to the gluteal tuberosity. It is innervated by the

Inferior gluteal nerve (L5, S1, S2), a branch from the sacral plexus. 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 position of the inferior gluteal nerve makes it vulnerable to iatrogenic injury during posterior and posterolateral approaches to the hip. To preserve the function of the gluteus maximus muscle, the precise knowledge of the origin and course of the inferior gluteal nerve is mandatory.<sup>2</sup>

## CASE REPORT

During routine dissection for undergraduate medical students, we observed an anomalous branch from sciatic nerve supplied gluteus maximus on left side, while the Inferior gluteal nerve was absent [Fig 1]. Innervation of gluteus maximus on right side was normal.



**Fig 1: Showing an anomalous branch (AB) from the sciatic nerve (SN) which supplies the gluteus maximus muscle (GMM) from its deeper surface. Inferior gluteal artery (IGA). Piriformis muscle (PM)**

## DISCUSSION

The present case showed on the left side of the gluteal region, a separate branch from the sciatic nerve, which supplied the gluteus maximus muscle in the absence of inferior gluteal nerve. But the nerve supply on the right side was normal. In general variations of the gluteus maximus muscle is very rare. As per the previous literature the most medial fibers may be separate to get inserted on the lateral lip of the linea aspera. The muscle may have an independent additional origin from the lumbar aponeurosis of the ischial tuberosity. A distinct slip at the lower border, arising from the coccyx and attached to the femur may also be found representing the caudal head. The fibres arising from the sacrotuberous ligament and the margins of the sacrum normally separated from the superficial part by a layer of areolar tissue, a very rare variation is the fusion of gluteus maximus and fascia lata.<sup>3</sup> Paval et al., noticed inferior gluteal nerve consisting of two branches, these branches were one above and one below the lower slip of the piriformis muscle. The two branches united in front of the piriformis muscle and formed a common trunk and then supplied the gluteus maximus muscle.<sup>4</sup> Yan et al<sup>5</sup>, noticed an exit of inferior gluteal nerve from the upper edge of the piriformis (suprapiriformis foramen) in 4.26% Japanese cases (4/94 sides). The inferior gluteal nerve frequently provides a communicating branch that joins the posterior femoral cutaneous nerve, or may also join with the nerve to the short head of Biceps.<sup>3</sup> Kirici et al., reported bilateral

muscular and neurovascular anomalies of the gluteal region in a cadaver on the right side, the gluteus maximus had two parts, one of which was fibrous and the other muscular. In addition, there were duplicated piriformis muscle and high division of sciatic nerve.<sup>6</sup> Bhattacharya et al., observed on the left side, double piriformis with a dual nerve supply of gluteus maximus and additional supply of the gluteus maximus was from the common peroneal nerve.<sup>7</sup>

## CONCLUSION

The knowledge of such variations may be of importance to the clinicians during surgeries of the hip joint, hip replacement therapy, during intramuscular injections.

**Conflict of interest: Nil**

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