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Double superior gemellus together with double piriformis and high division of the sciatic nerve

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Summary: We report a case with double superior gemellus and double piriformis mm. associated with the sciatic n. dividing high and passing between the two piriformis mm. in the same lower extremity. This abnormality has not previously been described in the literature. As many musculoskeletal structures may be involved in sciatica, the supernumerary superior gemelli and piriformis mm. may exert pressure on the sciatic n. and this should be taken into account by clinicians.

Association de muscles jumeau supérieur et piriforme doubles à une division haute du nerf sciatique

Résumé : Nous rapportons le cas de l'association de muscles jumeau supérieur et piriforme doubles à une division haute du n. sciatique. Ce nerf avait la particularité de passer entre les deux mm. piriformes. Cette anomalie n'a pas été signalée dans la littérature. De la même manière qu'un certain nombre de structures musculo-squelettiques sont susceptibles de provoquer une névralgie sciatique, la présence de mm. jumeau supérieur et piriforme surnuméraires est susceptible de comprimer le n. sciatique. Aussi cette anomalie doit-elle être connue des cliniciens.

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In the gluteal region, the sciatic n. passes below or through the piriformis m. and anterior to the superior gemellus m. which separates it from the hip joint [16]. The relation between the sciatic n. and the piriformis m. has been extensively studied; even racial differences have been detected [2, 9, 10, 15]. However, to our knowledge there is no report describing supernumerary superior gemelli and piriformis mm. and their relationship to the sciatic n.

Case report

In the right gluteal region of a 63-year-old male cadaver, a combined variation was encountered. When the gluteus maximus and minimus were retracted, the piriformis was observed as two separate muscles. In this article, these are referred as the upper and lower piriformis mm. The upper piriformis was larger, and it was separated from the lower by the common peroneal and posterior femoral cutaneous nn. The tibial n. emerged below the lower piriformis m. (Fig. 1).

In addition to the variation described above, another interesting variation was observed when the further course of the sciatic n. was exposed. Just below the tibial n. and the lower piriformis m., an extra superior gemellus m. was observed. These two superior gemellus mm. though completely separate originated at the posterior aspect of the ischial spine very close to each other. Their insertions were also more or less at the same point; thus it is hard to name only one of them as the superior gemellus m. (Fig. 1).

The upper piriformis m. originated from the anterior surface of the sacrum by two digitations and the lower piriformis m. from the sacrotuberous ligament by a single digitation. The insertions of these two muscles were to the greater trochanter of the femur, very close to each other. Both of the superior gemellus mm. originated from the dorsal surface of the ischial spine, one above the other, and their insertions were at the greater trochanter of the femur. The two piriformis mm. and the two superior gemellus mm. in our cadaver were innervated by branches of the sacral plexus.

The obturator internus was easily observed below these two muscles with its white tendon (Fig. 1). The inferior gemellus and quadratus femoris mm., as well as the left gluteal region of the cadaver, were also observed and found to be completely normal.

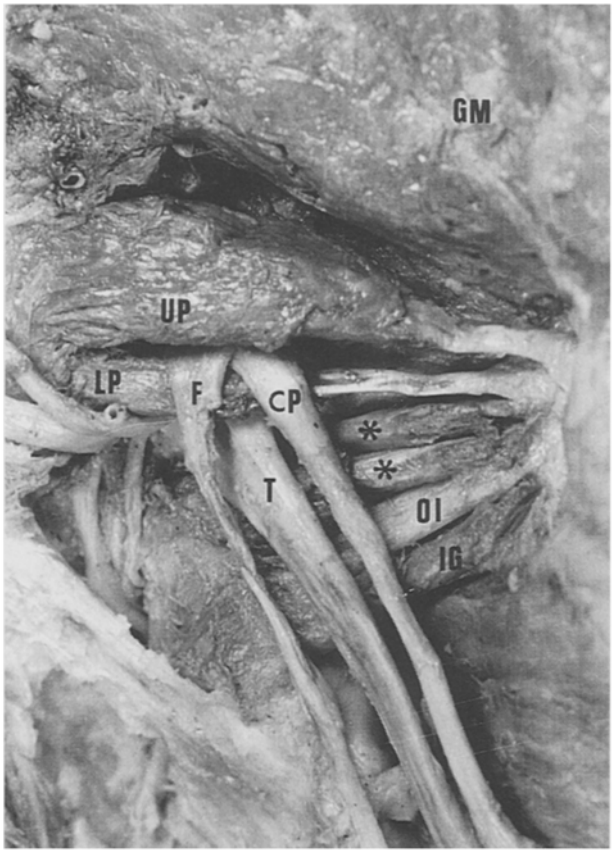

Fig. 1
Double piriformis, double superior gemellus and the high dividing sciatic n. passing between the two piriformis mm. *GM:* Gluteus medius m. *T:* Tibial n. *UP:* Upper piriformis m. *: Superior gemellus mm. *CP:* Common peroneal n. *OI:* Obturator internus m. *F:* Posterior femoral cutaneous n. *IG:* Inferior gemellus m. *LP:* Lower piriformis m.

Discussion

Variations of the superior gemellus and piriformis mm. are rare abnormalities. Absence of the superior gemellus m. is found in 8% of whites and 6% of blacks, but not reported in Japanese cadavers. It may have double origins or it may be composed of two fasciculi [14]. Among the various studies on the relation of the sciatic n. and the piriformis m., Beaton and Anson [2] found the nerve passing through the muscle in 0.8% of American bodies, and Parsons and Keith [11] found this ratio to be 2.2% in British bodies. Chiba [6], in his extensive study on 257 adults, found 175 where the piriformis m. was perforated by the common peroneal n. However, we could not find any study in the literature describing a combined variation of the superior gemellus and piriformis mm. and the sciatic n. in the same lower extremity.

The relationship of the sciatic n. to the piriformis m. is related to the compression of the nerve which is called the "piriformis syndrome". This rare syndrome may occur as a postoperative complication [3], but generally perforation of the piriformis m. by the sciatic n. is held responsible for the sciatica [5, 8, 12, 13]. However, the cause and even the existence of the piriformis syndrome is doubtful according to some other authors [4, 7]. Its diagnosis is primarily clinical, as no definitive investigations has been reported. This syndrome may be due to other soft tissue injuries as a result of rotation of the hip and MRI of the pelvic mm. have been offered as objective documentation of the compressing structure in severe cases [1].

The superior gemellus m., lying just anterior to the sciatic n. is amongst the soft tissues that may be involved in the piriformis syndrome. The supernumerary superior gemellus and the piriformis mm. in our cadaver may have exerted pressure on the sciatic n. In this unique condition, if the supernumerary superior gemellus were exerting any pressure on the nerve, this would be aggravated by external rotation of the hip joint, which would pull this extra m. backwards over the sciatic n. In addition, the extra piriformis m. might produce pain by internal rotation, as in the classically described form of the piriformis syndrome [4]. Involvement of musculoskeletal structures other than the piriformis m. in sciatica should also be taken into account by clinicians and MR imaging of the pelvic mm. may be very helpful for accurate diagnosis.

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