Suprapiriformis exit of the sciatic nerve:  
a case report

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ABSTRACT

The sciatic nerve is the largest nerve in the human body. It originates from the lumbosacral plexus (L4- S3). This nerve is subject to numerous anatomical variations, especially its relationship with the piriformis muscle. Total hip arthroplasties are one of the most performed procedures in orthopedics, and the later approach to this joint is quite frequent and care with the sciatic nerve is essential to avoid iatrogenic injury. We aim to report a rare anatomical variation of the sciatic nerve found during total hip arthroplasty in which the nerve passed above the piriformis muscle. Anatomical knowledge of these variants directly implies a better surgical technique, thus, the understanding the numerous dispositions of the sciatic nerve prevents iatrogenic injuries.

Keywords: sciatic nerve, anatomical variations, case report, suprapiriformis, total hip arthroplasty

INTRODUCTION

The sciatic nerve (SN) rises from the lumbosacral plexus (L4- S3) from the pelvis and reaches the gluteal region after passing the greater sciatic foramen. Usually, this nerves passes below the piriformis muscle, although several dispositions have been described in the literature [1-4]. Afterwards, the SN bifurcates at the popliteal fossa, thus originating the tibial and common fibular nerves. The SN provides branches for several muscles of the thigh, leg and foot, as well as the knee and foot joints [1-4].

Knowledge regarding SN variations is essential to the diagnosis and treatment of piriformis syndrome, sciatica and muscle atrophy. Piriformis syndrome is characterized by compression of the SN by the piriformis muscle. These conditions may lead to loss of sensorial and motor functions of the lower limb [1, 4].

Furthermore, the SN can be injured during total hip arthroplasty (THA) - a reliable procedure to treat arthritis, tumors or fractures. According to the literature, variations of the SN may increase iatrogenic possibility [1, 2, 4-6]. As such, the present work aims to report a rare variation of the SN in which it passed above the piriformis muscle.

CASE REPORT

A 72 years-old female patient sustained a right side femoral neck fracture (Garden IV) due to fall. The patient was previously diagnosed with type 2 diabetes and hypertension. She was then submitted to a THA.

During surgery, it was observed different disposition of the SN in which it passed above the piriformis muscle (Figure 1).

The procedure was uneventful and the patient recovered properly. She is also going through follow-up in our ambulatory.

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DISCUSSION

This work reports a rare variation of the SN. According to the literature, it is classified as Type F, as it passes above the piriformis muscle. It was shown that the Type F pattern was present in less than 1% of the studies, according to a meta-analysis [4].

The PM divides this region into two spaces: the suprapiriform space and the infrapiriform space [6]. The SN travels in the infrapiriform space near the inferior gluteal artery and its veins, the posterior femoral cutaneous nerve, the pudendal nerve, the internal pudendal artery and its veins, as well as the branches of the lumbosacral plexus to the lateral rotator muscles of the thigh. All these structures are under potential risk during subsequent access, therefore, anatomical knowledge and variations of these elements are needed [6-8].

The posterior approach of THA implies attention to the adjacent structures of the gluteal region, the SN, for example, can be easily felt by the surgeon, but it is difficult to see because it is immersed in adipose tissue [6]. In a study published in 2005, the highest rates of neuropaxia are found during posterior accesses, although these are rare complications [9, 10]. They are often caused by the pressure exerted by the retractors as the retraction can cause compression of the SN, especially in cases of high division, perforation of the fibular component in the pm (Type B) or if the fibular component runs on the upper edge of this muscle (Type C) [6, 7].

Early division of NI can lead to damage only in the fibular component or in the tibial component of the nerve, thus loss of motor function would be localized in the region of specific innervation of the tibial nerve or common fibular nerve, which may cause confusion at the time of diagnosis. Early division can also influence anesthetic blocks [5-8].

Variations of NI therefore need to be studied and known. Despite these variants regarding SN position, there are rare cases in which the SN may be formed at the gluteal region by isolated roots of the lumbosacral plexus or the SN can anastomose with the posterior femoral cutaneous nerve at the lower border of the MP [1].

CONCLUSION

In short, knowledge of SN variations is essential for the orthopedic surgeon who plans to perform THA in order to avoid iatrogenic lesions. The variability of NI versus MP may cause confusion at the time of operation. This work reports a rare variation of the SN in which it passes above the piriformis muscle.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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REFERENCES

RESUMO

Trajetória suprapiriforme do nervo isquiático: um relato de caso

O nervo isquiático é o maior nervo do corpo humano. Origina-se do plexo lombossacral (L4-S3). Este nervo está sujeito a inúmeras variações anatômicas, estas especialmente no que dizem respeito sobre sua relação com o músculo piriforme. A artroplasia total do quadril é um dos procedimentos mais realizados na área ortopédica, e o acesso posterior a essa articulação é bastante frequente, além de necessitar de cuidado com o nervo isquiático para evitar lesões iatrogênicas. Nosso objetivo é relatar uma variação anatômica rara do nervo isquiático encontrado durante uma artroplastia total do quadril em que o nervo passou acima do músculo piriforme. O conhecimento anatômico dessas variantes implica diretamente uma melhor técnica cirúrgica, assim, o entendimento das numerosas disposições do nervo isquiático previne lesões iatrogênicas.

Palavras-chave: nervo isquiático, variações anatômicas, relato de caso, suprapiriforme, artroplastia total do quadril