

CASE REPORT

Complete section of the external popliteal sciatic nerve during arthroscopic lateral meniscectomy

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KEYWORDS

Knee arthroscopy;
Complication;
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Abstract

Purpose: The aim of this paper is to present a case of external popliteal sciatic nerve injury, which is an unusual complication following knee arthroscopy.

Clinical case: We present the case of a patient who suffered a complete rupture of the external popliteal sciatic nerve (EPSN), following arthroscopic lateral meniscectomy, which required the use of a nerve graft to facilitate recovery.

Discussion: Nerve lesions following knee arthroscopy are rare. We have found no instances of complete nerve rupture accompanied by a break in neurologic continuity following meniscectomy. We have however found a few similar cases, which we report on in the paper.

Conclusions: Although uncommon, injury to nerve structures is possible during knee arthroscopy.

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PALABRAS CLAVE

Artroscopia de rodilla;
Complicación;
Sección nervio peroneo

Sección completa del ciático poplíteo externo durante una meniscectomía externa por artroscopia

Resumen

Objetivo: Comunicar la lesión del nervio ciático poplíteo externo (CPE) como complicación inusual tras una artroscopia de rodilla.

Caso clínico: Presentamos el caso clínico de un paciente que presenta una sección completa del nervio CPE, tras una meniscectomía externa por artroscopia, que precisó la realización de injerto nervioso para conseguir la recuperación.

Discusión: Las lesiones neurológicas tras la artroscopia de rodilla son infrecuentes, no hemos encontrado un caso de sección completa con pérdida de continuidad neurológica tras una meniscectomía y existen casos publicados similares que son comentados.

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Conclusiones: Aunque infrecuente, es posible la lesión de estructuras nerviosas durante la práctica de una artroscopia de rodilla.

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Introduction

Arthroscopic knee surgery has become the usual method for treatment of meniscal and ligamentous injuries in all traumatology and orthopaedics departments.

The low incidence of complications, between 1 and 4% of all arthroscopic procedures,^{1,2} has permitted lowering the costs of this treatment as well as the length of hospitalisation. Neurological injuries are much less frequent. The majority of these are neurapraxias of the saphenous nerve that recuperate spontaneously. We have found 6 publications that outline injuries to the external popliteal sciatic nerve (PCN) or common peroneal nerve such as clinical cases similar to the case presented in this study; 3 injuries that were secondary to a meniscal suture,^{3,5} a neuroma in continuity following a meniscectomy,⁶ an inside-out injury from treating an ACL,⁷ a traction injury,⁸ and one publication with 3 partial cases.⁹

The objective is to present the first case of a complete section without border continuity following a meniscectomy.

Case report

A 24 year old male patient, with no history of disease, received knee arthroscopy for treatment of a bucket-handle lesion of the external meniscus. Immediately post-operation, a complete deficit for performing dorsal flexion of the ankle and foot was observed. This was treated with a foot drop splint. The patient was remitted to our centre 2 months after the surgery, presenting with a complete paralysis of the musculature dependent on the peroneal nerve with tumour palpation behind the tendon of the biceps femoris. We performed electromyography tests, confirming the presence of a neurotmesis of the nerve. The NMR test showed an alteration in the signal of the posterior horn of the external meniscus and an image indicative of a continuity solution in the posterior capsule (fig. 1).

We decided to perform a surgical exploration, which was performed ten weeks after the initial arthroscopy; the patient received epidural anaesthesia while lying down with preventive ischaemia. We performed an arcuate incision after localising the peroneal nerve, in which a lesion was observed with nervous continuity and a separation between the two borders of about 8mm (fig. 2).

We performed a neurotomy of the edges of the nerve, which were remitted for anatomopathological studies; these showed the presence of nerve fibers and synovial and chondral tissues, indicating that it was pulled from within the joint before the nerve damage occurred.

We then performed a graft with 4 sural nerve fascicles, 3 of which were free and one transferred along with its vascularisation to the area for grafting (fig. 3). The knee was then immobilised with an orthopaedic splint with 10° flexion of the knee for 3 weeks.

Six months after the nerve graft, the patient only presented functionality in the peroneal muscles. We then performed a transposition of the posterior tibial through the interosseous membrane and reinserted the posterior tibial in the second wedge. The EMG at this point showed the presence of motor units in only the peroneal muscles.



Figure 1 Saggital slice of the knee MRI displaying an alteration of the signal of the posterior horn in the external meniscus and an image indicative of injury to the posterior capsule.

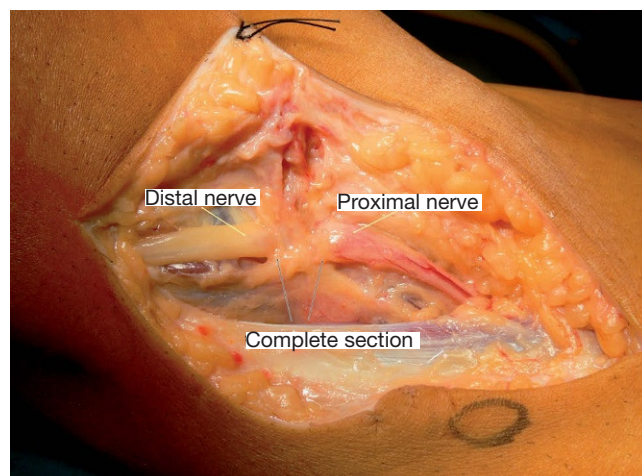


Figure 2 Posteroexternal approach to the knee, in which a complete lesion in the external popliteal sciatic nerve can be observed.

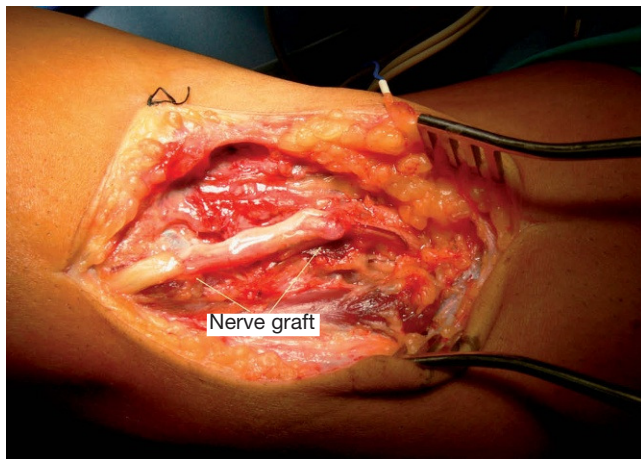


Figure 3 The same image after repair of the nerve with a sural graft.

At 9 months after the nerve surgery, the patient showed motor function in the anterior tibial, the extensor of the first toe, and the common extensor muscles of the toes.

At 12 months, the patient could walk without problems, with proper functioning of the extensor muscles of the foot and ankle, except for a discrete deficit in the toe extensors; he reinitiated his occupational activities and commenced sports again. The electromyography showed the presence of motor units in the anterior tibial, the peroneals, and the toe extensors.

Discussion

The incidence of nervous complications in arthroscopic surgeries of the knee is around 0.6%¹ and can reach 0.06% when performed by experienced surgeons.²

In the international medical literature, little has been written on nervous injuries of this kind during an arthroscopic knee procedure.

In 1988, Miller³ made the first reference to this type of injury; the nerve had become trapped in a suture outside of the external meniscus, causing partial damage to the nerve, which was treated by fully removing the suture. One year later, Jurish⁴ presented a similar case.

The first to present the case of an inside-out injury was Rodeo⁶ in 1993; the patient presented with a continuity neuroma following a partial interior and exterior meniscectomy, indicating that the lesion was produced by the penetration of an instrument at the height of the posterolateral capsule. Such was the case in our experience, where the NMR image displayed a lesion in the posterior capsule, as well as a scar tissue biopsy that showed the presence of synovial tissue and chondral material around the selected nerve fibers. The principal difference in our case was the nervous injury, neuroma in continuity as opposed to a complete section with substance loss the size of basket-type clamps, and that the neurological lesion was treated with grafts derived from the sural nerve.

Peicha⁷ presented a complete lesion with inside-out mechanism produced during an exploratory ACL surgery. A year after the surgery, the patient required a PCN repair using 3 sural nerve grafts and a transposition of the posterior tibial, which achieved 5° of dorsal flexion in the ankle. This author performed an anatomical study in which the conclusion was that the only way to injure the peroneal nerve is to perform a manipulation of the external compartment of the knee in full extension. Johnson⁸ presented a case of injury by traction as a possible aetiology. Krivic⁵ presented a case of a complete lesion in continuity of the nerve secondary to a suture in the external meniscus; the injury in this case was produced by an anatomical variation in the localisation of the nerve.

In no case did the injury to the peroneal nerve receive a partially vascularised nervous graft as in ours, a technique that is relatively easy to perform given the proximity of the sural nerve to the PCN. It is possible that the vascularisation of this graft helped to improve recuperation in the same way as surgical exploration and early nervous reparation.

Although the PCN injury during arthroscopic procedures is very rare, it must be taken into account, especially when treating damage to the external meniscus. Any positioning in varus extension that brings the PCN in close proximity to the posterior capsule⁷ should be avoided, as well as performing the arthroscopy in position “4.”

Conflict of interest

The authors affirm that they have no conflicts of interest.

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