Delayed appearance of hypaesthesia and paralysis after femoral nerve block

Stefan Landgraeber,[1] Thomas Albrecht,[1] Ulrich Reischuck,[2] Marius von Knoch[1,3]

[1]Department of Orthopaedics, University of Duisburg-Essen; [2]Department of Anaesthesiology, Kliniken Essen-Süd, Essen; [3]Department of Orthopaedic Surgery, Bremerhaven General Hospital, Bremerhaven, Germany

Abstract

We report on a female patient who underwent an arthroscopy of the right knee and was given a continuous femoral nerve block catheter. The postoperative course was initially unremarkable, but when postoperative mobilisation was commenced, 18 hours after removal of the catheter, the patient noticed paralysis and hypaesthesia. Examination confirmed the diagnosis of femoral nerve dysfunction. Colour duplex sonography of the femoral artery and computed tomography of the lumbar spine and pelvis yielded no pathological findings. Overnight the neurological deficits decreased without therapy and were finally no longer detectable. We speculate that during the administration of the local anaesthetic a depot formed, localised in the medial femoral intermuscular septa, which was leaked after first mobilisation. To our knowledge no similar case has been published up to now. We conclude that patients who are treated with a nerve block should be informed and physician should be aware that delayed neurological deficits are possible.

Introduction

Neurological complications after peripheral nerve blocks are rare. They are typically found directly after the operation and persist for long time. We report a case of delayed appearance of neuropathy after an initially smooth postoperative course.

Case Report

A healthy 49-year-old woman (170 cm height and 72 kg weight) was admitted to our hospital for arthroscopy-assisted reconstruction of the anterior crucial ligament (ACL) and partial medial meniscectomy on the right side. Under general anaesthesia a femoral nerve block was administered using a standard technique[1] with an 18-gauge needle (Contiplex D®, B. Braun Melsungen AG, Carl-Braun-Str.1, 34212 Melsungen, Germany) connected to a nerve stimulator (Stimuplex HNS 12®, B. Braun Melsungen AG, Carl-Braun-Str.1, 34212 Melsungen, Germany). The femoral nerve was stimulated at a depth of approximately 1.5 cm on the first attempt. Contraction of the quadriceps muscle as indicator of motor response was obtained at a current of 0.25 mA (0.3ms/2 Hz). The anaesthesiologist performing the injection noted no bleeding or other complication. The local anaesthetic (40 mL ropivacaine 0.5%) was administered without resistance. After this, 10 mL ropivacaine 0.2% per hour was administered continuously by the femoral catheter.

Operative lesion of the ACL was not observed, so only a partial medial meniscectomy was performed. The surgical procedure took 21 min and proceeded uneventfully. A thigh tourniquet was not used. After the operation the patient received 10 mL ropivacaine 0.2%/h for five hours, then the femoral catheter was removed. At that time the patient had no neurological deficiency. After mobilisation the next morning, the patient noted hypaesthesia on the medial side of the right thigh. During the course of the day we noticed increasing neurologic deficits. On examination by a consultant neurologist in the afternoon (29 hours after the operation), the patient lacked sensation on the anterolateral side of the thigh and the medial side of the lower leg, which corresponds to the skin area supplied by the nervus saphenus. Moreover, the patient had paralysis of the quadriceps and iliopsoas muscle with a level of strength of 2/5 respectively 4/5. The patellar reflex on the right side no longer functioned. In conclusion, the neurologist confirmed the diagnosis of femoral nerve injury and advised examination by computed tomography of the lumbar spine and pelvis. This examination produced no evidence of haematoma or any other pathological findings. Finally, a catheter-induced aneurysm of the femoral artery was excluded by colour duplex sonography.

During the following night the neurological deficits decreased without therapy. On examination 24 hours after the neurological deficits had appeared, the patient had no paralysis and the muscle extension reflexes of the legs were normal and symmetrical. Only one small skin area with hypaesthesia remained. It was localized in the infrapatellar region and disappeared in the following 24 hours.

Discussion

Neurological injuries after nerve block procedures are an infrequent but serious complication. The incidence of block-related neural lesions is 0.22% for all nerve block procedures[2] and 0.1% to 0.4% for femoral catheters.[3,4] Normally, these complications are induced by an intraneural injection of local anaesthesia or by an accidental vascular puncture which can cause nerve injury due to pressure ischemia, either as perineural haematoma or by occupying and pressurizing an anatomical compartment.[3-5] We had expected that neurological deficits caused by an intraneural injection would be long-lasting and detectable directly after operation.[6] Vascular damage was excluded by computer tomography. Nerve lesions associated with surgical procedures could be ruled out because there were no intraoperative complications and a tourniquet was not used. Neurotoxicity of ropivacaine is an uncommon but well documented complication of regional anesthesia.[7,8] In this case the symptoms reveal directly after injection and the Central Nervous System (CNS) is afflicted.

We speculate that during the administration of the local anaesthetic a depot of ropivacaine 0.2% formed which was localised in the medial femoral intermuscular septa. This would explain why the patient did not have any kind of neurological deficits until mobilisation was commenced: The contraction of the surrounding muscles and the following increase of pressure in the septa led to a leak of the ropivacaine depot.

To our knowledge no similar case has been published up to now. We draw the following conclusions: Patients who are treated with a nerve block, especially a continuous femoral nerve block catheter, should be informed and physician should be aware that delayed neurological failures are possible. This is even more important if they leave the hospital shortly after surgery. Finally, we conclude that if an intraneural injection and a haematoma is excluded it is justifiable to forgo specific therapy like administration of cortisone.

Correspondence: Stefan Landgraeber, Department of Orthopaedics, University of Duisburg-Essen, Pattbergstrasse 1-3, 45239 Essen, Germany.
Tel.+49.201.4089.2146 - Fax: +49.201.4089.2722.
E-mail: stefan.landgraeber@uni-due.de

Key words: regional anesthesia; knee arthroscopy.

Received for publication: 27 November 2011.
Accepted for publication: 28 December 2011.

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Orthopedic Reviews 2012; 4:e8
doi:10.4081/or.2012.e8

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