

Peroneal Nerve Palsy after Arthroscopic
Partial Lateral Meniscectomy

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Case Presentation

A 46 year old, healthy weight female patient visited our outpatient clinic with complaints of the right knee. Since a few months she experienced symptoms of a locked knee without explainable cause and localized pain on the lateral side. During physical examination no remarkable findings came up, except for recognizable pain and crepitus when pressure was applied on the lateral joint space. At radiographic imaging nothing aberrant was to be seen. So the patient was planned for an arthroscopy of the right knee to remediate the lateral com-partment and inspect the meniscus. Work diagnosis was logically a lateral meniscus lesion.

Routine knee arthroscopy placing was executed and a padded thigh tourniquet inflated to 250 mmHg was adjusted. Anterolateral and anteromedial portals were made. Two trocars were inserted. There after the knee was distended with fluid. Varus force was routinely applied in 20° flexion. A flap tear in the posterior part of the lateral meniscus was found. After removing the tear with a cutting device a 4.5mm Dyonics (Smith&Nephew©) shaver was introduced to smoothen the remaining part of the posterior meniscus. This was performed by repetitive motion along the tissue in oscillating mode of the shaver blade. No concomitant pathology was identified in the knee during arthroscopy. The complete procedure lasted around 15 minutes and went uneventfully.

After the operation (and emptying the knee of fluid) a swelling was noticed subcutaneously around the location of the fibular head. This decreased quickly after removing the tourniquet. Back in the recovery room when the patient came by, she noticed that she could not move her right foot properly. Skin sensibility of the right foot and lower leg was impeded as well. This persisted for hours after the operation. There were no symptoms of compartment syndrome. We assumed reversible common peroneal nerve palsy occurred.

The following day we checked on the patient again to see if there was improvement of neural function. This was not the case, as the patient came walking in on two crutches with a foot drop. She also complained about having no sensation under her foot and a part of her ankle. We were endorsed in our assumption of the nerve injury and sent the patient to an orthopedic instrument facility for an ankle-foot orthosis. Also we arranged an appointment with her neurologist to acquire more information about peroneal function and reversibility of injury by means of an EMG.

Etiology

There are several reasons to mention for damage to the peroneal nerve in knee arthroscopy.

Traction

Varus force needs to be applied for good exposure of the lateral meniscus. By doing so, traction on the peroneal nerve is possible especially if more pressure is adjusted to reach the farther posterior part of the lateral meniscus with the shaver. We estimate this cause as plausible.

Aberrant Course of Peroneal Nerve

Anatomic variations of the peroneal nerve are described previously, e.g. due to tunnel formation of the posterior and distal extents of the biceps femoris muscle. There could have been an anatomical variation in our case, in which the peroneal nerve may be located closer to the joint capsule and thus more likely susceptible to damage. Though we reckon on the chance this being the reason of peroneal damage to be small.

Direct Injury Due To Instrumentation

Instrumentation used in arthroscopy consists of the trocars, camera, working tools and the shaver. Trocars are placed carefully with the knee flexed in hanging position, hence not in proximity of the nerve. Working tools are used for hooking up the meniscus and feel its mobility; the shaver is used to remove tears and smoothen the surface. Both are inserted through the trocars and thus in a protected manner. Therefore we consider this to be an unlikely cause of injury in our case.

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Tourniquet

We know that tourniquet time is a predictor for complications (see discussion). However the operation time in our case is quite short, i.e. around 15 minutes. Also the tourniquet pressure was 250mmHg, which is lower than Kim et al. report in literature. They state that neurological problems can occur due to tourniquet usage, but only in an operation time from 30 minutes to 3 hours and pressures of 300mmHg or more [1]. We think our tourniquet management is of minor influence on the injury.

Our thoughts on the cause of the nerve dysfunction remain uncertain. We presume a tear occurred in the joint capsule on the posterolateral side of the knee, caused by shaving the lateral meniscus. Compression on the nerve is likely to have taken place due to fluid flowing extraarticular through the joint capsule into the space around the nerve. However, 5 months after the procedure no recovery of peroneal function was observed.

Discussion

In a review of literature on this subject Rodeo et al. describe an overall complication rate ranging from 0.6 to 8.2% after arthroscopic procedures. Five reports are known where injury to the peroneal nerve was associated with arthroscopy and two of these involved meniscal repair. After six months complete sensory and motor function had recovered [2].

Another case report by Johnson et al. state that complete and incomplete saphenous nerve lesions with few relating to the common peroneal nerve occurred by direct damage due to instrumentation. The cause in this particular case was a traction injury due to patient positioning [3].

Kim et al. report a neurologic injury incidence of 0.01 - 0.06% after arthroscopic knee surgery. Involvement of the peroneal nerve was reported to be 5% of this incidence, the majority was subscribed to the saphenous nerve and in 47% the nerve was not specified. Also they conclude that a posterior incision and usage of a deflecting

retractor for meniscal repair is considered to be very essential in avoiding unwanted damage to neurovascular structures. Another risk for peroneal nerve damage is its anatomy during surgery.

Sherman et al. say the highest rate of instrument breakage is associated with partial removal of the lateral meniscus. Also, the surgeon related experience with arthroscopic procedures does not involve the rate of complications. Age and tourniquet time were evident predictors of complications, illustrated by multiple regression analysis [4].

Overall, peroneal nerve palsy following arthroscopic lateral meniscectomy is an uncommon but serious complication as recovery of the nerve is a slowly process. Full patient rehabilitation requires collaboration of the surgeon with a neurologist, paramedical therapists and even in some cases necessitates neurosurgical intervention. Statistically the odds of curing of this impairment are high, because it almost seems impossible to directly harm the peroneal nerve. This damage during routine arthroscopic lateral meniscectomy is very rare, where pressure of fluid and traction due to varus stress appear to be the most important agents. In our case nevertheless, a time frame of almost six months without signs of recovery is unfavorable according to literature.

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