Femoral nerve injury following appendectomy

Case report

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The author reports a case of femoral nerve damage following appendectomy, and discusses its pathophysiology and successful treatment. The anatomical and clinical presentation of this entity in the literature is reviewed, and some suggestions for its recognition and treatment are offered.

KEY WORDS  •  appendectomy  •  electromyography  •  femoral nerve injury

Damage to the femoral nerve following surgical interventions has been reported, but such cases are sparse. This report documents a case of femoral nerve injury following appendectomy, and describes its successful management. A brief review of the literature is included.

Case Report

This 12-year-old boy was referred to a county hospital on April 25, 1980, suffering from acute appendicitis. Appendectomy was performed on the same day. There was a minor complication of peroperative bleeding reported from epigastric vessels due to an unusual location of the appendix. Postoperatively, the patient complained of impairment of gait. At examination, complete paralysis of the right femoral nerve was found. Blunt trauma to the nerve during operation or postoperative edema compressing the nerve was the suspected etiology. After observation for 10 days, the patient was referred to our neurosurgical clinic for evaluation.

Examination. A total loss of function of the femoral nerve was found, with combined motor and sensory damage, namely, paralysis of the quadriceps musculature, anesthesia of the medial border of the thigh, and absence of the knee jerk on the right side. Electromyography (EMG) revealed total denervation of the femoral nerve. After a further period of observation, EMG was repeated on July 30 (over 3 months after injury); this again revealed total denervation. On the suspicion that the nerve was transected or severely compressed, a microsurgical exploration was performed on August 8.

Operation. At surgery, the femoral nerve was explored along its course under the inguinal ligament, both rostrally and caudally. Four silk sutures were found just beneath the inguinal ligament; one went straight through the nerve, and the other three constricted the nerve tightly. Nerve stimulation elicited a clear response from the central portion of the nerve, but stimulation of the portion distal to the sutures did not produce a response. With careful dissection, the sutures were removed. After removal, nerve stimulation both rostral and caudal to the injured area showed minimal but visible response.

Postoperative Course. Daily EMG recordings performed during the following 2 weeks showed no activity; however, oscilloscope-conducted skin electrodes indicated some minimal response by the end of the 2nd week, which could have been a response from the tensor fasciae latae muscle.

After the patient was discharged, intensive physiotherapy was instituted. On November 12, 1980, EMG showed signs of reinnervation for the first time postoperatively in the muscle groups of the rectus femoris and vastus lateralis 10 cm caudal to the inguinal ligament. The vastus medialis muscle was still denervated. Clinical improvement was also noted: the boy was able to walk without support. Repeat examination on February 18, 1981, showed reinnervation of the vastus medialis muscle, with further improvement of gait, cutaneous sensibility, and increase in volume of the previously atrophied muscles. Further EMG ex-
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aminations later in 1981 have shown complete recovery of function, and the patient’s condition has returned to normal.

Discussion

The femoral nerve fibers arising from the L2-4 nerve roots join as a single nerve at the junction between the psoas and iliacus muscles, approximately 5 cm above the inguinal ligament and lateral to the femoral artery. Underneath the inguinal ligament, this nerve gives off cutaneous-sensory branches supplying the ventral and medial aspects of the thigh and leg, and motor branches supplying the iliac, psoas, pectineus, sartorius, and vastus muscles. Consequently, a lesion involving this combined nerve results in both sensory and motor impairment of the thigh, especially in its medial aspect, with inability to walk and to extend the leg. The pathophysiological explanation in almost all cases is ischemia, following compression or distension of the nerve fibers.

Previous experimental studies with compression of the sciatic nerve in cats have shown impairment of transmission, both proximally and distally, for 6 to 8 weeks after injury. Clinically, the state of function of the injured nerve can be followed reliably by repeated EMG examination, at least in cases where the exact mechanism of injury is not definitely known.

Although this condition is rare, there have been some reports of unilateral femoral nerve injury, especially after gynecological operations. Instances have been recorded after urological operations, delivery maneuvers, appendectomies, operations for hernia, and during correction of a congenital dislocation of the hip joint. Occasionally, bilateral injuries have been described. Probable mechanisms have been suggested, including compression of the nerve by self-retaining retractors, and extreme flexion and abduction of the hip joint during operations under general anesthesia.

The present case illustrates the typical course of a femoral nerve injury, with impairment of flexion of the thigh and EMG evidence of denervation during a period of 3 months after the injury. Reinnervation signs appeared in the 12th week after surgery, and there was complete restitution of function 18 months later. We believe that whenever there is postoperative evidence of femoral nerve injury, expectant observation for the first 2 to 3 months is advisable. However, if EMG examination shows persistent signs of denervation, exploration of the nerve should be performed.

References


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