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Case Report

Ultrasound-guided treatment of meralgia paresthetica: case report

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ABSTRACT

Meralgia paresthetica (MP) or so-called as lateral femoral cutaneous nerve (LFCN) entrapment is a mononeuropathy characterized by a localized area of paresthesia, dysesthesia, tingling, burning, and numbness on the anterolateral aspect of the thigh, between the inguinal ligament and the knee without associated loss of reflexes and motor weakness. The incidence of MP increases with obesity and diabetes. Ultrasound-guided has been demonstrated useful for visualization of peripheral nerves, in particular very small nerves such as the LFCN. Hereby, we reported a case of 63-year-old man diagnosed with MP. The patient complained of numbness, and no pain when pinched in his anterolateral aspect of the left thigh since 3 weeks ago. On physical examination, his body mass index (BMI) was 27 (overweight) with normal vital signs. Neurological examination revealed normal motoric function and refleks; but decreased sensation to pinprick in the left anterolateral thigh in the LFCN distribution. No abnormal findings on plain radiographs of the pelvis and lumbar spine. Ultrasound-guided injection was performed in this patient.

Keywords: MP, LFCN, Local nerve block, Ultrasound-guided treatment, Lateral femoral cutaneous nerve, Meralgia paresthetica

INTRODUCTION

The LFCN is a pure sensory nerve that travels from the lumbosacral plexus to the inguinal ligament and into the anterior thigh subcutaneous tissue. Anterolateral thigh pain and dysesthesia are symptoms of the clinical disorder known as MP, which is brought on by compression of the LFCN. Bernhardt Roth syndrome, LFCN syndrome, and lateral femoral cutaneous neuralgia are other names for MP.[1,2]

The incidence rate of MP was 4.3 per 10,000 patient-years.[1] The condition known as MP, or LFCN neuropathy (LFCN), typically affects people between the ages of 40 and 50, though it can occur at any age. Women are more likely to develop it than men, and diabetics (who develop it 47 times more frequently than the general population), obese, and pregnant patients are at an increased risk. The symptoms may relieve with weight loss, abdominal exercises, or childbirth, but they may also worsen with walking or prolonged standing.[2,3]

In patients who do not respond to oral treatment, regional LFCN nerve block is common recommended as an effective MP treatment. However, anatomical diversity leading to failure rates for regional nerve blocks.[1,2]

CASE REPORT

A 63-year-old male patient came to the neurology polyclinic with complaints of numbness, and no pain when pinched in his anterolateral aspect of the left thigh since 3 weeks ago. Complaints are felt to appear suddenly without knowing the cause and felt continuously. The patient had

never experienced anything similar before. His past medical history was significant for Diabetes Mellitus since 2020 with the treatment of metformin 500 mg every 12 hours per oral and glimepiride 1 mg every 24 hours per oral. The patient denied any hypertension, trauma, or malignancy. The patient also denied any lower back pain, limb motor weakness, radicular pain in the lower extremities, bowel or bladder loss of function or control, saddle anesthesia, or symptoms with cough, sneeze, or Valsalva.

The patient has never provided treatment for complaints. The patient is a pensioner. The patient has a wife and 2 children and 3 grandchildren. The patient lives with his wife. His height was 172 cm, and his body weight was 80 kg with a BMI of 27 kg/m^2 (overweight). He has been a vegetarian since 1998 (24 years ago) and wore a strict belt since he was young.

On physical examination, he was noted to have a BMI of 27 (overweight) with normal vital signs. His gait was normal. He had normal hip flexion and extension, thigh adduction and abduction, knee flexion and extension, ankle dorsiflexion, and plantar flexion with toe flexion and extension graded 5/5 by the medical research council scale and symmetric. Neurological examination revealed 2/4 deep tendon reflexes at patellar and achilles tendons, and hypesthesia/ decreased sensation to pinprick in the left anterolateral thigh in the LFCN distribution. He had a negative straight leg raise/ laseque, negative bragard, and siccard test. No abnormal findings on plain radiographs of the pelvis and lumbar spine.

Figure 1: Local nerve block with injections of local anasthetic (lidocaine) and corticosteroid.

He was diagnosed MP and treated with meloxicam 15 mg every 12 hours per oral, gabapentin 300 mg every 12 hours per oral, and mecobalamin 1 tablet every 12 hours per oral. After 1 week, the patient's symptoms persisted. The patient's symptoms were partially relieved after the local nerve block with injections of local anesthetic (lidocaine) and corticosteroid. Injections made 1 finger medial to the anterior superior iliac spine (ASIS), under the lateral end of the inguinal ligament or where the lateral cutaneous nerve fibers exit from the fascia lata. With continued NSAID and gabapentin, her symptoms almost completely subsided by 1 month after injection.

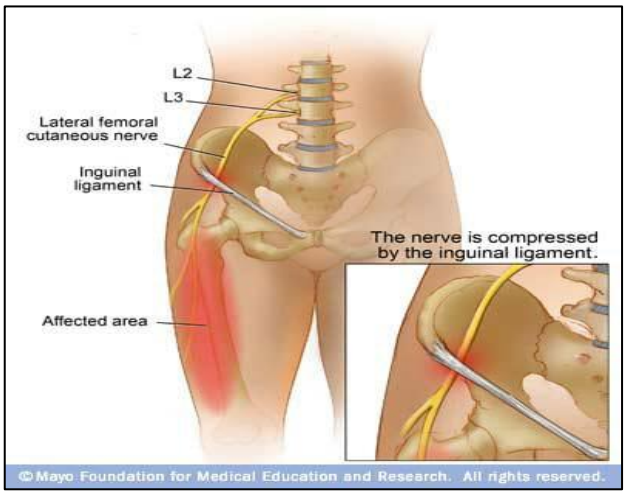

Figure 2: Area of compression of the LCFN.

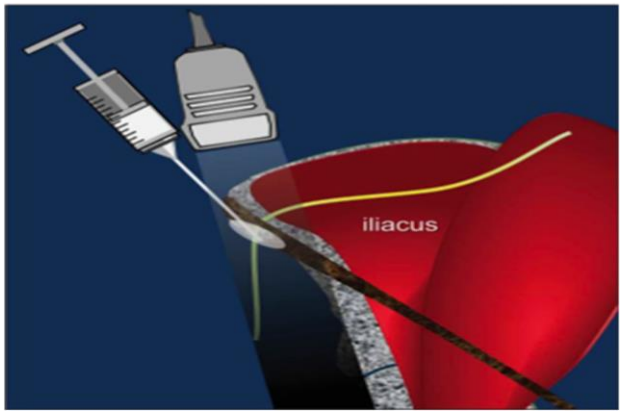

Figure 3: Ultrasound-guided injections at the lateral femoral cutaneous nerve.

DISCUSSION

MP, originally known as the Bernhardt-Roth syndrome, was first described by Bernhardt and Roth in 1895.[3] The term was coined from the Greek words "meros"-thigh and "algos"-pain. By definition, MP is a neurological disorder resulting from compression of the LFCN, a purely sensory branch of the L2/L3 nerve root as it crosses between the ASIS and the inguinal ligament, while entering the thigh. It is characterized by a localized area of paresthesia, tingling, burning, and numbness on the anterolateral aspect of the thigh without associated with radiating pain, weakness/motor changes and reflex changes.[4]

The incidence rate of MP was 4.3 per 10,000 patient-years. it is most frequently noted in 30- to 40- year-olds and higher incidence in men.[1,4]

It is important to note the anatomic variation of the nerve with respect to diagnose and treat the syndrome. The LFCN is a purely sensory nerve supplying sensation to the

anterolateral surface of the thigh. The LFCN is formed from the second lumbar and third lumbar nerve roots, merging with the lumbar plexus and travel along the posterolateral aspect of the psoas major muscle, over the iliac muscles in the iliac fascia to the area of the ASIS. The LFCN usually bifurcates below the inguinal ligament into an anterior and posterior division; this area is the most common site of LFCN lesions.[5,6]

The etiology of MP can be categorized into two types, Spontaneous and Iatrogenic. Iatrogenic MP may occur as a complication of some surgical procedures (pelvic osteotomy, bone graft harvesting, the insertion of pins in the ASIS during external fixation of the pelvis, and during anterior surgical approaches to the hip and pelvis). Spontaneous MP divided into idiopathic, metabolic, and mechanical factor. The mechanical factors such as obesity, pregnancy and other conditions associated with an increase intra-abdominal pressure. The use of tight belts, corset, and tight trousers can cause the direct pressure on the LFCN.[7,8]

Metabolic factors that have been implicated in MP include lead poisoning, alcoholism, thyroid disease, and diabetes mellitus. There are two theories explaining how diabetes mellitus develops into MP. The first theory is the defect of myoinositol and phosphoinositide metabolism result in impaired Na-K-ATPase activity, leading to impaired nerve function. The second theory is that nerve swelling due to decreased axoplasmic transport, which makes the nerve more susceptible to compression. However, optimization of blood glucose does not ameliorate the situation.[9]

The diagnosis of MP is relatively simple. It is often made by symptom, anamnesis, and physical examination. The symptoms of MP are paresthesia, tingling, burning, and numbness on the anterolateral aspect of the thigh, never extend below the knee. Symptoms of MP are purely sensory deficits and do not correspond to the dermatome.[9,10]

Although the diagnosis of MP can be established by history and physical examination, a relevant differential diagnosis is still necessary. Red flags, such as iliac crest metastases and intervertebral disc herniation, may mimic MP. The LFCN may also be compressed along its retroperitoneal course by space-occupying lesions, such as tumors. MP symptoms accompanied by gastrointestinal and urogenital complaints suggest a pelvic tumor.[9,10]

The initial treatment of MP is conservative treatment by pharmacotherapy and correcting mechanical or postural problems that causes of nerve compression (losing weight, not wearing tight belts, avoid tight clothing). Oral medications, such as nonsteroidal anti-inflammatory drugs (NSAIDs) can reduce the inflammatory process that may be causing intrinsic compression, antidepressants and anticonvulsants can relieve neuropathic pain and numbness). Local nerve block/local injections using anesthetics and corticosteroids may be useful to reduce local inflammation. This injection is performed at 1 cm medial to the ASIS, or in the area of maximal tenderness. Patients who fail to respond to conservative therapy should be considered for surgery. The high rate of success of conservative therapy should be kept in mind when deciding on operative intervention.[9,11]

Wide anatomical diversity along the LFCN reduces the effectiveness of blind anaesthetic blocks, resulting in failure rates for regional nerve blocks as high as 60%; therefore, ultrasound (US) is ideal for peripheral nerve visualization for diagnostic and therapeutic purposes, especially very small nerves with millimetric diameters like the LFCN.[12,13] It is well known that a general anesthetic carries much more risk than an injection with US guidance. On the other hand, compared to surgery, US has the benefit of being relatively rapid, safe, and affordable. However, US results can vary depending on the user.[14]

Either the direct or indirect technique may be used for US-guided injection. After precise sonographic measurements have been taken, the latter refers to a blind injection while the former relates to either an in-plane (long axis) or an out-plane (short axis) procedure. The direct in-plane approach can be used to administer the injection, allowing the user to see the needle's long axis the entire time.[15]

The preferred approach is in plane with the needle course from lateral to medial. The nerve is visualized along its short axis when the probe is moved gradually toward it and tracked in real time. The diagnosis of MP may be confirmed by performing a US-guided diagnostic block close to the nerve enlargement with a small amount of anesthetic (about 1 cc), which results in a significant pain decrease (>50% on a numeric rating scale of pain). Medications that usually used for a nerve block injection include local anesthetic or glucocorticoid. For therapeutic options, mixture of 1 cc lidocaine and 1%/1 cc betamethasone can be administered. At the site of nerve compression or just above it, the mixture is injected. The injection is monitored in real time while the tunnel of the nerve is punctured.[7,15]

CONCLUSION

MP is a mononeuropathy LFCN characterized by complaints of pain, numbness or tingling in the anterolateral region of thigh, which is easily recognizable features that usually allows the clinician to make an immediate or "spot" diagnose. However, red flags such as tumor and lumbar disk herniations must be recognized and ruled out. The treatment of MP is also simple, with an excellent prognosis. Overall, reducing risk factors, such as weight loss and avoid tight dressing or tight belt and conservative treatment, such as nonsteroidal anti-inflammatory drugs (NSAID), antidepressant tricyclic, anticonvulsant, and local nerve block gives excellent responses. Ultrasound-Guided has been demonstrated useful for visualization of peripheral nerves, in particular

very small nerves such as the LFCN. Therapy surgery needed for the patient which has not improved with conservative treatment.

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