Management of meralgia paresthetica

Paul H. Williams, M.D., and Kenneth P. Tezil, M.D.
Memphis, Tennessee

Meralgia paresthetica is a syndrome of pain or dysesthesia, or both, in the anterolateral thigh caused by entrapment or neurinoma formation of the lateral femoral cutaneous nerve. Conservative treatment was successful in relieving symptoms in 91% of 277 patients with this syndrome; however, 24 patients required surgical treatment for intractable symptoms. Although neurolysis with transposition is the most common procedure, sectioning of the lateral femoral cutaneous nerve was performed in 24 cases and was successful in 23. One patient had early symptomatic relief, but subsequently developed different neurological signs and symptoms because of an undetected pelvic neoplasm.

Anatomical variations of the nerve and neurinomas, which occur frequently, are easily handled with sectioning but may lead to recurrence with neurolysis and transposition.

Key Words • meralgia paresthetica • neurinoma • femoral nerve

Meralgia paresthetica was originally known as the Bernhardt-Roth syndrome. Both men published articles independently of each other in 1895: Vladimir Roth,14 a Russian Muscovite, and Martin Bernhardt1 from Berlin. Actually, in 1878 Bernhardt2 had described a case of meralgia paresthetica without going into detail. In 1885 Hager9 wrote about hip pain secondary to the lateral femoral cutaneous nerve (LFCN) ("n. cutan. femoris ant. externus") after trauma and even described a surgical resection of the nerve with good results.

Sigmund Freud3 published a short paper detailing his own affliction of "Bernhardt's syndrome" in 1895. Freud gave an eloquent discussion of his symptoms which had begun 7 years before and listed a few curious cases. He spoke of "tight clothes about the waist" and "its [LFCN's] abnormal position" as contributing to the etiology of the syndrome.15 It may suffice to postulate that Freud was something of a sartorial dandy and that "tight clothes about the waist" was prominent in his own case.

Roth14 is credited for coining the term “meralgia paresthetica” (meros - thigh, algos - pain) from the Greek. The renowned Osler12 published an article on this subject in 1897. In 1900, Harvey Cushing operated on the famous astrophysicist Simon Newcomb for meralgia paresthetica. The surgery was apparently initially successful yet the symptoms recurred. Fulton, in his biography of Harvey Cushing, noted the incident as an embarrassing one.5 This “embarrassing incident” may well have been the source of the avoidance of surgery for meralgia paresthetica for quite some time.

The senior author's experience with this entity began with the forceful insistence of a patient for surgical relief after failure of a 1-year course of conservative treatment. This started an interest in meralgia paresthetica by the senior author and a 25-year collection of 277 cases of this disorder. In this paper we outline the management of meralgia paresthetica and discuss its various causes.

Summary of Cases

Case Material

The charts of the operative series of 24 patients undergoing surgical treatment for meralgia paresthetica were reviewed. Age of patients at the time of surgery ranged from 19 to 68 years (median 51 years, average 48 years). The duration of symptoms ranged from 2 months to 6 years (average 1 year) after starting conservative treatment. The long-term follow-up period was 4 to 25 years (median 17 years).

Female-to-male ratio was 14:10. Six of the 24 patients had undergone at least one prior surgical procedure for their symptoms. All patients underwent the same procedure. The only difference noted was in altering the area of the skin incision to the point of the presumed pelvic exit of the LFCN.
Management of meralgia paresthetica

Conservative Treatment

Since the vast majority of patients do well with conservative therapy, an outline of conservative treatment is reviewed. Removal of any inciting constricting items about the waist (including wide belts, braces, casts, or tight undergarments) may be all that is necessary and is the initial intervention. The patient is also instructed to apply ice at the area of presumed constriction for 30 minutes three times a day in an attempt to alleviate the swelling of the nerve at the area of constriction. Nonsteroidal anti-inflammatory agents of choice are given for 7 to 10 days. Any exacerbating physical activities (that lead to hip extension) should be eliminated. A follow-up evaluation is performed in about 2 weeks. Fifty percent of the patients responded well enough to these measures that further treatment was unnecessary.

Steroid Injection

For persisting discomfort of meralgia paresthetica an injection of 5 to 10 cc of a local anesthetic agent and a corticosteroid may provide relief. The local anesthetic agent is injected at the point of tenderness and fanned out about the area to anesthetize the nerve or all branches of the nerve. A separate syringe is used for injection of 1 cc of corticosteroid. These conservative measures were used alone or in combination in all 277 patients over varying time frames. Fifty percent of the patients were injected at least once and some patients had been injected as many as four times over a 6- to 12-month period. Only when the complaints became intractable and disabling was surgery contemplated. It should be repeated that conservative treatment alone will reduce most patient's symptoms to an acceptable level.

Surgical Procedure

With the patient under general anesthesia, the skin incision is a 4- to 6-cm oblique incision centered 2 cm distal to the area of tenderness at the presumed pelvic exit. It has been our experience that a high percentage of the entrapment leading to symptoms of meralgia paresthetica occur at or near the area where the nerve exits the pelvis and this area will be tender to palpation. Exposure is carried down to the level of the LFCN. Since the surgery is exploratory (trying to locate a nerve of variable course in subcutaneous tissue), adequate exposure is a necessity. Once identified, the LFCN is examined for pathology and followed back to its pelvic exit. A nerve stimulator should be used at this point to insure that the nerve identified has no motor component. The nerve is pulled distally and sectioned so that the released proximal end falls back into the pelvis, obviating neurinoma formation. A nerve segment of at least 4 cm is resected, including removal of obvious pathology (16 of the 24 patients we reviewed had neurinomas). Multiple branches of the LFCN, up to four exiting the pelvis, were found in some of our patients. All branches should be resected. Previous studies have only described resection of the obvious pathology or transposition of single twigs of the nerve if they appeared normal, but this may be the source of some recurrences. A fibroed scarred nerve may appear normal grossly but still cause pain. Submitted pathology specimens in four patients revealed this profile.

Results of Treatment

From the total collection of 277 cases of meralgia paresthetica seen over a 25-year period, 253 patients underwent conservative therapy with satisfactory relief of symptoms. Twenty-three of the 24 patients in the operative group had satisfactory results, defined as relief of the presenting symptoms, including the anterolateral thigh pain and dysesthesia, without recurrence. One patient had early symptomatic relief but within 6 months developed marked lower-extremity neurological deficits secondary to an undetected pelvic neoplasm.

Although neurectomy does leave the patient with anterolateral thigh anesthesia, this fact was not reported by any of the patients as a significant shortcoming. Only one patient had a problem related to the anesthesia and this was a first-degree burn which healed readily. Ingrowth of surrounding sensory fibers appears to occur with gradual shrinkage of the zone of anesthesia as time elapses.

Discussion

Diagnosis

The neuropathy of the LFCN presents with signs and symptoms mostly confined to the anterolateral thigh, although they may range from just inferior to the knee (one patient in our series) to the gluteal region and may cross somewhat to the medial side of the thigh. Patients complain of pain and burning or crawling sensations with a variable degree of numbness. Frequently the condition is exacerbated with hip extension such as while walking or getting in and out of automobiles. The diagnosis can be established by routine physical examination. Cutaneous stimulation to the thigh by light touch frequently produces dysesthesia with meralgia paresthetica and a variable area of anesthesia to pin-prick is found. An area of hair loss may be found on the thigh due to the patient's rubbing of the thigh. The rubbing or massaging of the thigh in an attempt to relieve symptoms is so common that it may be taken as a diagnostic clue (Fig. 1). With suspected meralgia paresthetica, forceful palpation proximally and distally to and along the inguinal ligament and at the pelvic brim usually reveals a localized tender area that reproduces the patient's symptoms. Injection of 5 to 10 cc local anesthetic at this tender area should relieve the patient's symptoms, confirming the diagnosis.

Differential Diagnosis

The differential diagnosis is not complicated, especially if the local injection has provided symptomatic
P. H. Williams and K. P. Trzil

gastrointestinal or urogenital symptoms should raise suspicion. An abdominal/pelvic ultrasound study or CT scan should be performed if there is any concern that a mass lesion may be present.

Meralgia paresthetica with a purely mechanical etiology has been the center of discussion, but as an isolated expression of a metabolic neuropathy, this condition is not unknown. Diabetes mellitus, alcoholism, and lead poisoning have all been described as affecting the LFCN. Several of the patients in this series with diabetes had apparent mechanical causes for their meralgia paresthetica. None had any relief of symptoms with optimization of their blood glucose level. The treatment goal is the same for both mechanical and metabolic etiologies of meralgia paresthetica: relief of the patient’s complaints; therefore, the therapeutic approach is the same.

Pathogenesis

An important factor in the development of LFCN entrapment and subsequent treatment is anatomical variation. Anatomy text books and some studies on meralgia paresthetica report the LFCN exiting the pelvis at the anterior superior iliac spine (ASIS) as a single nerve; however, Keegan and Holyoke described a 30% variation, and most other studies used the term “frequent.” Anatomical variation may allow the LFCN to be subjected to inordinate trauma. Some of the anomalies noted in our series, not previously reported, include the exiting of the LFCN 4 cm posterior to the ASIS, through a notch in the ilium, over an anterior inferior iliac spine bone spur, through the mid portion of the inguinal ligament, and 6 cm medial to the ASIS adjacent to the femoral nerve. As many as four branches of the nerve exited the pelvis in some cases, and frequent neurinoma formation of single nerves or even multiple neurinomas on multiple branches of the nerve were encountered (Fig. 2). Sixteen (67%) of our 24 operative cases had neurinomas present on surgical specimens submitted to the pathology department in several hospitals. Neurinoma formation has previously been described in pathological specimens, but not in recent surgical studies.

Surgical Management

Surgical relief from the syndrome of meralgia paresthetica dates from 1885 and multiple procedures have been suggested. The arguments against surgery have been the frequency of poor results and recurrence associated with it. Although the condition is a benign one, intractable pain and disability secondary to a peripheral sensory nerve dysfunction should be correctable. Multiple studies of surgery for meralgia paresthetica have been done and basically three surgical techniques have evolved for this disorder: neurolysis of the constricting tissue only, neurolysis and transposition of the LFCN, and neurectomy with excision of a portion of the LFCN. Neurolysis with transposition of the LFCN

relief. Probably the most common entity confused with meralgia paresthetica is the lumbar disc syndrome. Differentiation from lumbar radiculopathy is important; in five cases in this operative series laminectomies were performed for apparent meralgia paresthetica. Three of our operative cases were in patients referred for spinal fusion following failed laminectomies. In meralgia paresthetica, neurological dysfunction is wholly sensory and there should be no weakness or reflex deficit. There is no lumbar pain or sciatic notch tenderness and no straight-leg raising sign. Clinical findings and an electromyogram (EMG) should differentiate meralgia paresthetica from lumbar radiculopathy but computerized tomography (CT), magnetic resonance imaging, and/or myelography may assist in the diagnosis. Somatosensory evoked potentials have been used to reliably diagnose meralgia paresthetica if further clarification is needed.

Femoral neuropathy may also mimic meralgia paresthetica. To exclude this possibility, an EMG was obtained on all of our operative cases treated in the past 15 years.

Etiology

The etiology of meralgia paresthetica should be established once the diagnosis has been made and this may either be easily provided by history and observation or be quite elusive. The possible etiologies of meralgia paresthetica are myriad: at least 80 have been reported. Some of the more common are pressure from tight or wide belts (especially police and carpenter’s belts), tight pants, postsurgical scars after abdominal surgery (five in this series), pregnancy, iliac bone graft harvest (two in this series), ascites, obesity, abdominal/pelvic mass, and metabolic neuropathies. Pelvic masses may be the hardest cause to elucidate. Any concomitant

Fig. 1. Drawing of an extremely hairy individual who had rubbed his thigh so much that the hair had been rubbed off the area supplied by the lateral femoral cutaneous nerve.
Management of meralgia paresthetica

Fig. 2. Anatomical variations of the lateral femoral cutaneous nerve (LFCN). A: Lateral view of the pelvis with neurinoma formation as the LFCN passes through a notch between the anterior superior and inferior areas of the iliac spine. B: The LFCN exiting the pelvis over the iliac crest with neurinoma formation. C: The LFCN exiting the pelvis through the inguinal ligament with neurinoma formation. D: The LFCN exiting the pelvis as two branches with neurinoma formation on one branch. E: The LFCN exiting the pelvis as three branches with neurinoma formation on the middle branch. F: The LFCN exiting the pelvis far medially in close proximity to the femoral nerve.

has been the most popular approach. For example, in 1962, Keegan and Holyoke[10] described two cases of a more extensive release and transposition with good results and, in 1989, Aldrich and Van der Heever[1] described a suprainguinal release and transposition. In both studies, the technique was contingent upon the nerve appearing as a single trunk at the ASIS. The presence of demonstrable pathology such as neurinoma formation and the frequency of anatomical variation renders neurolysis and transposition difficult. To transpose a neurinoma is to invite failure or recurrence of the patient's symptoms. Two cases in our series presented with failure of transposition. Removal, as in the situation of Morton's neurinoma, is curative; actually, meralgia paresthetica is quite analogous to Morton's neurinoma. The transposition of four small nerve branches in this area is difficult to achieve technically. The results and findings of this study with its long follow-up period indicate that sectioning is a viable alternative to the more commonly accepted procedure and is capable of managing the pathology and degree of variation of the LFCN with a low rate of recurrence.

Conclusions

The syndrome of meralgia paresthetica has a long history, being the first discovered sensory mononeuritis (largely from mechanical dysfunction). The extreme anatomical variability of the nerve and the high percentage of demonstrable pathology have an impact on both the development of the syndrome and its treatment. Results of the treatment are based primarily but not completely on subjective relief or lack of relief of the patient's complaints. Removal of inciting agents and the use of ice packs, anti-inflammatory medications, and local injections provide relief for the vast majority of patients. Occasionally, surgery can provide relief for intractable pain and disability. Sectioning of the LFCN appears to offer uniformly good results and should be easily reproducible once adequate identifica-
tion of the nerve is accomplished, with recurrences minimized or eliminated.

References

5. Freud S: Ueber die Bernhardt’sche Sensibilitatsstorung am Oberschenkel. Neurol Centralln 14:491–492, 1895
14. Roth VK: [Meralgia paresthetica.] Med Oboz 43:678, 1895 (Ger)

Manuscript received November 10, 1989. Accepted in final form June 13, 1990.
Address reprint requests to: Paul H. Williams, M.D., 1388 Madison Avenue, Memphis, Tennessee 38104.