# Meralgia paresthetica

## A retrospective analysis of 79 patients evaluated and treated according to a standard algorithm

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**Background** **The efficacy of various treatment modalities in meralgia paresthetica (MP) is not established. We retrospectively evaluated the management of spontaneous MP (i.e. MP not secondary to trauma or surgery) according to a standard algorithm.**

**Methods** **Initial management included oral medications, rest, and reduction of aggravating factors. Non-responders underwent a diagnostic local anesthetic nerve block test. Patients who responded with transient symptomatic relief were treated by local infiltration of corticosteroids. Surgical intervention was reserved for patients with positive nerve block test, who did not respond to nonoperative measures.**

**Results** **A negative nerve block test ruled out the diagnosis of MP in 6/86 patients. Of 79 patients with MP, 21 responded to the initial nonoperative treatment and 48 patients responded to local corticosteroids. 3 of the remaining 10 patients underwent surgery (nerve transection 2, neurolysis 1). During an average of 3 (1–13) years of follow-up, symptoms consistent with MP did not recur in any of the 72 patients in whom symptoms had resolved after treatment.**

**Interpretation** **The algorithm used proved to be useful in the management of spontaneous meralgia paresthetica.**

Meralgia paresthetica (MP) is a mononeuropathy of the lateral femoral cutaneous nerve (LFCN) characterized by pain, numbness and tingling in the anterolateral aspect of the thigh. Symptoms are mainly associated with injury or pressure on the nerve (Massey 1998). The LFCN is a sensory nerve that originates from the first 3 lumbar nerve roots and travels along the posterolateral aspect of the psoas over the iliacus muscle to the region of the anterosuperior iliac spine (ASIS). It enters the anterior region of the thigh by passing under, through, or above the inguinal ligament. The nerve divides into anterior and posterior divisions at a variable distance from the ASIS. The anterior branch penetrates the fascia lata approximately 10 cm inferior to the ASIS, and supplies the skin over the anterolateral aspect of the thigh down to the knee. The smaller posterior branch innervates the skin over the greater trochanter down to the area supplied by the anterior branch (Streiffer 1986, Grossman et al. 2001).

MP can be categorized as either spontaneous or secondary to trauma or surgical procedures that may have injured the LFCN (Grossman et al. 2001). It is a relatively uncommon condition; in a recent case-control study that used computerized data from a large cohort in the primary care setting, the incidence rate of MP was 4 per 10,000 individuals (van Slobbe et al. 2004).

The LFCN can be subjected to compression at several sites along its course, most commonly as the nerve exits the pelvis near—or at—the site where it pierces or crosses the inguinal ligament. Predisposing factors include external causes (e.g., wearing of seat belts, girdles, tight trousers, beepers or cellular phones), obesity, pregnancy,


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intra-abdominal disease that increases intrapelvic pressure, and certain anatomical variations of the LFCN (Keegan and Holyoke 1962, Streiffer 1986, Grossman et al. 2001).

Local anesthetic nerve block is expected to result in rapid and temporary relief of MP symptoms (Kadel et al. 1982, Streiffer 1986, Edelson and Stevens 1994). Clinical conditions associated with upper lumbar nerve compression (Jiang et al. 1998) or intra-abdominal compression of the LCFN (Suber and Massey 1979) can mimic MP. In such cases, the local nerve block is not expected to relieve symptoms.

Since MP can lead to significant distress and disability, it is important to properly diagnose and treat this condition. Nonoperative treatment includes rest and reduction of aggravating factors that could compress the nerve, oral medications (e.g. nonsteroidal anti-inflammatory drugs (NSAIDs), antidepressants and other medications to relieve neuropathic pain), and local injections of anesthetics and corticosteroids (Streiffer 1986, Massey 1998, Grossman et al. 2001). Overall, conservative management has yielded excellent results, and surgery is considered only when pain becomes intractable and disabling after other treatment modalities have failed (Streiffer 1986). Surgical options include neurolysis or transaction of the LFCN (Nahabedian and Dellon 1995, van Eerten et al. 1995, Siu and Chandran 2005).

As most published series have employed a variety of treatment modalities and included relatively small patient groups, the efficacy of individual treatment modalities is unclear (Grossman et al. 2001). In this paper we report the management and long-term outcome of 79 patients with long-standing spontaneous MP that was evaluated and treated according to a standard algorithm adopted at our clinic.

## Patients and methods

This study is a retrospective cohort analysis of consecutive patients who presented with symptoms consistent with spontaneous MP, and were diagnosed and treated according to a standard algorithm. The preliminary diagnosis was based on the patients' history of sensory symptoms in the distribution of the LFCN, associated with physical examination findings of reduced or increased sensitivity to pain and touch in the same distribution. Patients with known etiologies of secondary MP (e.g. prior pelvic orthopedic surgery and pelvic trauma) were not entered into the study.

The initial treatment for all patients consisted of oral NSAIDs and analgesics, rest, and avoidance of likely causes of nerve compression (e.g., tight clothing, heavy objects in pockets, and use of beepers or cellular phones strapped on wide belts). Obese patients were advised to lose weight. If symptoms did not resolve within a period of up to 3 months with the above-noted treatment, a diagnostic nerve block test with local anesthesia was performed. 5–10 mL of 1% lidocaine HCl solution was injected 1 cm medial and inferior to the ASIS (i.e., the site where the lateral femoral cutaneous nerve usually exits the pelvis) or at the point of maximal tenderness. The test was considered positive if there was prompt relief of symptoms lasting for at least 30–40 min. Patients who did not respond were re-tested 3–4 weeks later, with infiltration of the lidocaine solution to a wider area. The diagnosis of MP was considered unlikely in patients who failed to respond to the second nerve block test.

All patients with a positive local anesthetic test were treated with local infiltration of corticosteroid (1 mL suspension containing 5 mg betamethasone as diproprionate and 2 mg betamethasone as sodium phosphate) to the same site as that infiltrated in the local anesthetic test. Up to 3 successive corticosteroid injections were administered every 4–6 weeks, as required by the patient's clinical course. Surgical intervention was reserved for patients with intractable symptoms who responded to the nerve block test but had no long-term relief following 3 corticosteroid injections.

Patients who did not respond to the nerve block test underwent further evaluation to rule out lumbar nerve compression or intra-abdominal compression of the LFCN. CT of the lumbar spine was performed on all patients. In addition, female patients underwent ultrasound of the pelvis and lower abdomen to rule out a pelvic tumor.

## Results

From 1990 through 2002, 85 consecutive patients with symptoms consistent with spontaneous MP were evaluated and treated in accordance with the aforementioned policy. The diagnosis of MP was considered unlikely in 6 patients who failed to respond to oral NSAIDs and analgesics, rest, and reduction of aggravating factors, and who subsequently had a negative LFCN block test. These 6 patients (4 women) were further evaluated according to our algorithm. CT of the lumbar spine revealed significant spinal stenosis and nerve root compression at the level of L1-3 in 3 patients, and was normal in 3 patients. Pelvic and lower abdominal ultrasound failed to demonstrate pathological findings in any of the 4 women.

The remaining 79 patients (59 women) constituted the study group of spontaneous MP. Their mean age was 43 (16–73) years. The mean duration of symptoms at first presentation was 34 (13–56) months. Sensory findings were confined to the anterior lateral aspect of the distal thigh (i.e. in the distribution of the anterior division of the LFCN) in all except 1 patient, a 71-year old woman whose sensory symptoms and findings extended to the proximal aspect of the thigh (i.e, in the distribution of the posterior division of the LFCN). None of these patients demonstrated sensory findings distal to the knee or in the medial aspect of the thigh. Symptoms were bilateral in 2 patients.

21 patients reported satisfactory results following the initial nonoperative treatment. The LFCN block test was performed on the remaining 58 patients and was positive in all. In 3 patients the test was positive only after the second lidocaine injection. After the local anesthetic injection, 3/58 patients developed transient weakness of the quadriceps muscle which subsided spontaneously within 3 h. All of these 58 patients were treated with a local corticosteroid injection. Complete resolution of symptoms was noted in 48 patients. Response was achieved after the first local corticosteroid injection in 22, after the second corticosteroid injection in 12, and after the third attempt in 14 patients. No adverse effects resulting from the corticosteroid injection procedure were observed.

10 patients failed to respond to 3 successive corticosteroid injections. 3, who suffered from intractable symptoms, underwent surgery. The nerve in all 3 patients was found to pass through a portal in the inguinal ligament; 2 (a 35-year old man and a 41-year old woman) underwent nerve transection and alcohol injection to the stump, and the third patient (a 16-year old girl) underwent neurolysis and transposition of the LFCN. These patients reported complete resolution of symptoms following surgery, which was maintained throughout the follow-up period.The other 7 patients refused surgery and have remained symptomatic.

Duration of follow-up in the 72 patients who responded to treatment ranged from 1–13 years (mean 3.3 years). During the follow-up period, symptoms consistent with MP did not recur in any of the patients.

## Discussion

Data describing the clinical features of MP are predominantly case reports or series of few patients only. Our series comprised 79 consecutive patients evaluated and treated according to a standard algorithm at a single institution. The age of our patients (mean 43 years) is consistent with other data in the literature; MP is usually a complaint of middle age (Grossman et al. 2001)—although it may occur in all age groups, including children (Edelson and Stevens 1994). There is no consensus in the literature about sex predominance (Grossman et al. 2001). The female predominance in our series (1:3) is in contrast to a series published in much older literature (Ecker and Woltman 1938), but is in accordance with a recently published case-control study showing that MP is more common in females (van Slobbe et al. 2004). While the presentation of MP is usually unilateral (Massey 1998), a 20% incidence of bilateral involvement was reported by Ecker and Woltman (1938). In our series, only 2/79 patients had bilateral symptoms.

The diagnosis of MP is primarily a clinical one, based on history and physical examination (Massey 1998). Electrodiagnostic studies such as nerve conduction testing and somatosensory evoked potentials findings (Lagueny et al. 1991, Seror 1999) are useful mainly when the history and physical examination are unconfirmatory (Massey 1998), and were not used in this study.

Rapid and temporary relief of symptoms following LFCN local anesthetic block has been described as being a specific diagnostic test for MP (Kadel et al. 1982, Streiffer 1986, Edelson and Stevens 1994). In our study, the LFCN block test was carried out only when symptoms were refractory to initial nonoperative treatment. It was positive in 58 of 64 patients who were referred with symptoms consistent with MP, and predicted durable symptomatic relief following local corticosteroid infiltration in 48 of 58 patients.

Patients with symptoms consistent with MP who do not respond to the local anesthetic infiltration require further evaluation for conditions that can mimic MP. The main differential diagnosis of idiopathic MP includes symptoms originating from upper lumbar spine compression, such as in spinal stenosis (Jiang et al. 1988) and lumbar disc herniation (Trummer et al. 2000), or from proximal compression of the lumbar plexus due to intrapelvic tumor (Suber and Massey 1979). In our study CT of the lumbar spine, performed in the 6 patients with a negative nerve block test, revealed significant spinal pathology in 3 cases.

Nonoperative treatment of MP has been reported to yield excellent results (Streiffer 1986). Williams and Trzil (1991) reported that nonoperative treatment consisting of NSAIDs, local ice, and removal of constricting items about the waist was successful in 91% of 277 patients. In a smaller series, Ivins (2000) demonstrated that only 5/14 patients with MP had long-lasting improvement from local analgesics, steroids, NSAIDs, rest, and reduction or elimination of aggravating factors. In our study, 69/79 patients achieved relief with nonoperative treatment. In 21, symptoms resolved following the initial nonoperative treatment and the other 48 patients obtained relief after local corticosteroid injections. Importantly, during the follow-up period of at least 1 year, symptoms consistent with MP did not recur in any of the patients.

Surgical management was offered to 10 of the 79 patients, but was performed in 3 patients only with satisfactory results. The preferred surgical management of MP has remained controversial, although a small study by van Eerten et al. (1995) found that nerve transaction was superior to neurolysis. In our study, the nerve was found to pass through a portal in the inguinal ligament in all 3 patients who underwent surgery. Indeed, variations in the anatomy of the LFCN about the anterior superior iliac spine have been reported, rendering the nerve susceptible to compression (Keegan and Holyoke 1962), which might explain the failure of nonoperative treatment in these patients.

Based on our experience, we conclude that the algorithm we used is useful in the evaluation and management of patients with spontaneous MP. The LFCN block test plays a pivotal role in the diagnosis of MP and should be conducted in patients who do not respond to initial nonoperative therapy. Local infiltration of corticosteroids is highly effective after failure of initial treatment and eventually only a small portion of patients will require surgery.

### *Contributions of authors*

AH design of the study, data analysis, literature research, manuscript preparation. TP literature research, data analysis, manuscript preparation. PB-G data analysis, literature research, manuscript preparation. SD design of the study, data acquisition, data analysis, manuscript editing.

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