## Click to prove you're human



```
Meralgia paraesthetica is a nerve (neurological) condition that causes an area of skin over the upper outer thigh to become painful, numb or tingly. Meralgia paraesthetica is a nerve entrapment syndrome. This means it is a collection of symptoms caused by a trapped or compressed nerve. The trapped nerve in question is called the lateral
cutaneous nerve of the thigh (also known as the lateral femoral nerve). The most common symptoms are burning pain or numbness in the upper thigh, on the outer side. Children and younger people may just have pain that limits normal activities. Other symptoms include altered sensation of that part of the thigh, or tingling/pins and needles.
Symptoms tend to be made worse by walking and standing but relieved by lying down with the hip flexed. (Hip flexion is movement of the leg towards your tummy (abdomen); this can be with your knee bent or straight - but on your back it is easiest to draw your bent knee up to your chest.) Other reported symptoms include aching in the groin, pain in
the buttocks and an area of skin that seems super-sensitive to heat and light touch (as opposed to firm pressure). Most cases have no identifiable cause. Meralgia paraesthetica can, however, be caused by direct injury to the lateral cutaneous nerve of the thigh accidentally. For example: A seat belt injury from a car accident. Inadvertently, during
medical or surgical procedures - for example, keyhole (laparoscopic) hernia repairs. Various sports and physical activities can be associated with meralgia paraesthetica. These include gymnastics, baseball, soccer, bodybuilding and strenuous exercise. Rarer causes include a neuroma. Neuromas are non-cancerous (benign) growths (tumours) on a
nerve. Pelvic or intra-abdominal tumours (including cancerous ones) could also compress the nerve and cause this problem. This is rare. Other possible causes include lying down for long periods of time in a curled-up position. Diabetes can affect nerves in general and, although it would be unusual simply to have this one nerve affected, the lateral
cutaneous nerve of the thigh could potentially be damaged by diabetes. Meralgia ParaestheticaThe lateral cutaneous nerve of the thigh is found in the upper leg. It provides sensation to an area of skin on the upper outer thigh. If this nerve is trapped or compressed, burning pain, numbness or tingling might be felt in the area of skin supplied by the
nerve. These symptoms constitute meralgia paraesthetica. The lateral cutaneous nerve of the thigh is a sensory nerve that supplies the skin. It starts off in the lumbar region. It has to pass over the front of the hip bones and under the inguinal ligament before reaching the thigh. The inguinal ligament is a tough
fibrous band in the groin. This is the site at which the nerve is most commonly compressed or trapped. Anyone can develop meralgia paraesthetica. It is much rarer in children. Risk factors include obesity, pregnancy and ascites. Ascites is the term used for
a tense swelling of the tummy (abdomen) due to fluid. Meralgia paraesthetica is a very uncommon condition. It most often affects people between the ages of 30-40 years. The condition is thought to be much rarer in children. It occurs more often in men than in women. A doctor can make the diagnosis based on your symptoms and examination of your symptoms.
body. The diagnosis is likely to be suspected if you have typical pain or sensory symptoms affecting the upper outer thigh. The condition might show altered sensation in the area of skin supplied by the lateral cutaneous nerve of the thigh. The pain can usually be
provoked by getting you to extend your hip. Hip extension is the movement of the leg backwards. The main buttock muscle (gluteus maximus) tightens when you make this movement of the leg or hip. Your doctor will check
to see that there is no weakness of the muscles - if there is, the diagnosis is not meralgia paraesthetica. However, an ultrasound scan may be used if there is concern that a mass in the pelvis is causing the symptoms. Further tests may
be done if an underlying problem or alternative diagnosis is suspected. If you have meralgia paraesthetica arising from an accident or injury (such as a pelvic fracture) then other tests will be needed. In some cases, nerve conduction tests look at the electrical
activity running through a nerve. This is adversely affected if a nerve is compressed or trapped. Treatments (which are non-surgical) and surgical treatments (operations). In most cases, only conservative treatments are needed. Examples of conservative treatments include: If you have meralgia paraesthetical treatments are needed.
it is also advisable to avoid tight clothing, such as belts or corsets, that presses on the upper thigh/hip area. Surgical treatment involves taking the pressure off the nerve (surgical decompression) and releasing any entrapment. Generally, the prognosis is good. Often, the symptoms of pain and pins and needles resolve with time but sometimes the
numbness and altered sensation can remain long-term. However, if there is a serious underlying cause of the entrapment (this is rare) then the prognosis will depend on the underlying cause of the entrapment of, or agreement with, the contents by
NLM or the National Institutes of Health. Learn more: PMC Disclaimer | PMC Copyright Notice . 2023 May 6;46(1):107. doi: 10.1007/s10143-023-02023-2 Meralgia paresthetica is often idiopathic, but sometimes symptoms may be caused by traumatic injury to the lateral femoral cutaneous nerve (LFCN) or compression of this nerve by a mass lesion.
In this article the literature is reviewed on unusual causes for meralgia paresthetica, including different types of traumatic injury and compression of the LFCN by mass lesions. In addition, the experience from our center with the surgical treatment of unusual
causes for meralgia paresthetica. Specific attention was paid to factors that may have predisposed to LFCN injury and clues that may have pointed at a mass lesion. Moreover, our own database on all surgically treated cases of meralgia
paresthetica. A total of 66 articles was identified that reported results on unusual causes for meralgia paresthetica: 37 on traumatic injury in the literature was iatrogenic, including different procedures around the anterior superior iliac spine.
intra-abdominal procedures and positioning for surgery. In our own surgical database of 187 cases, there were 14 cases of traumatic LFCN injury and 4 cases in which symptoms were related to a mass lesion. It is important to consider traumatic causes or compression by a mass lesion in patients that present with meralgia paresthetica. The online
version contains supplementary material available at 10.1007/s10143-023-02023-2. Keywords: Trauma, Traumatic, Mass lesion, Schwannoma, Lipoma, Endometriosis Meralgia paresthetica is a mononeuropathy of the lateral femoral cutaneous nerve (LFCN). The LFCN is a pure sensory nerve that is formed by the roots L2 and L3 (Fig. 1). In the
retroperitoneal space the nerve runs posterior to the psoas muscle in a caudolateral direction and more distally runs on top of the iliac muscle. It frequently exits the pelvis just medial to the anterior superior iliac spine (ASIS) under the inguinal ligament, but anatomical variations have been described, where the nerve runs lateral to the ASIS or has a
more medial course [1]. In thigh the LFCN runs on top of the sartorius muscle, and distally it pierces the fascia lata and splits into multiple branches that innervate the skin. The LFCN is a pure sensory nerve. Patients with meralgia paresthetica often experience a tingling or burning sensation in the anterolateral part of the thigh. Pressure on the skin
may sometimes exacerbate symptoms (dysesthesia). Anatomical drawing of the course of the LFCN: The nerve originates from the nerve originates from the pelvis through the inguinal ligament (IL), just medial to the anterior superior iliac
spine (ASIS), and in the upper leg runs on top of the sartorius muscles (SM). This anatomical drawing shows the type B variant, which is most frequently encountered in patients with idiopathic cases, in which there is no clear cause for the
symptoms. It is questionable however if the term 'idiopathic' can be applied in meralgia paresthetica, because intra-operatively often a clear site of entrapment is found at the site where the LFCN pierces the inguinal ligament. Moreover, meralgia paresthetica has been reported to be associated with overweight, and sometimes symptoms have been
reported to occur after strenuous exercise [2], accidents (seat-belt injury due to a car accident) [3] or positioning for surgery such as prone positioning for surgery such as prone positioning for surgery such as prone positioning for spine (ASIS), including the
anterior approach for placement of hip prosthesis [5], the ilioinguinal approach for acetabular fractures [6], the harvest of iliac bone graft [7, 8] and inguinal hernia repair [9]. Moreover, several case reports have been published on unusual causes of traumatic injury and compression of the LFCN by mass lesions. The goal of this study was to review
the literature on unusual causes of meralgia paresthetica and investigate our own experience with the treatment of these cases from our surgical database. On September 7, 2022 a Pubmed search was performed using the search strategy provided in Appendix. Abstract was reviewed for unusual causes of meralgia paresthetica including traumatic
injury and potential compression by a mass lesion. All selected articles were read by the first (GdR) and senior author (AK). Only articles in which the mechanism of injury or cause for compression for the individual cases were excluded. In addition, case reports
that were published in Journals that could not be accessed were excluded (a PRISMA Flow Diagram is provided in Appendix). The included cases were screened for factors that might have predisposed to the LFCN injury. Remarks were made on potential pathophysiologic mechanisms, onset of symptoms, additional work-up that was performed, intra-
operative findings and anatomic variation in the course of the LFCN. For the latter we used the classification introduced by Aszmann et al. [1] that describes the course of the LFCN in relation to the ASIS in a coronal plane: type A: LFCN course lateral to the ASIS, type B and C: just medial to the ASIS (type C: between a split tendon of the sartorius
muscle) type D: 1-3 cm medial to the ASIS and type E >3cm medial to the ASIS. For mass lesions, all potential clues that might have pointed to an unusual cause were noted. Before start of the study, approval was obtained from the Medical Ethical Committee of our hospital to review the surgical database on meralgia paresthetica. A total of 187
cases were identified that had been operated in our Center between April 1, 2014 and September 1, 2022. All cases with potential traumatic injury to the LFCN or compression by a mass lesion. Results of surgical treatment were evaluated
retrospectively. Remarks were made on the description of symptoms, interval between trauma and presentation, additional work-up and presentation in the course of the LFCN. The PubMed search resulted in 757 hits. A total of 66 articles were selected, in which a clear mechanism of LFCN injury or cause of compression was
described that caused the symptoms of meralgia paresthetica. An overview of these articles is provided separately in Table 1 for different traumatic causes and Table 2 for different mass lesions. Literature review of traumatic causes of meralgia paresthetica: result from 37 articles First author Year of publication Direct cause Remarks on
pathophysiologic mechanisms, onset symptoms, additional work-up and intra-operative findings Massey 1977 Standing at attention for 2 h Lumbar lordosis, increased pelvic inclination and extension of the hip Cascells 1978 Rotating tourniquet on thigh Malfunctioning tourniquet with inflation > 20 min Grace 1987 Gastroplasty for morbid obesity 3
cases, likely caused by Gomez retractor Auriacombe 1991 Needle injury thigh Accidental, drug needle Parsonnet 1991 Coronary bypass surgery Frog-leg position of legs during vein harvesting Buch 1993 Fracture of ASIS Acute onset Andrew 1994 Laparoscopic inguinal herniorrhaphy 3 cases Swezczyk 1994 Bodybuilder Occurrence after training on
leg press machine Yamout 1994 Laparoscopic cholecystectomy External compression by surgeons positioned around table, alternative compression in the inguinal ligament secondary to extension hip Thanikachalam 1995 Fracture of ASIS Sudden sharp pain, importance plain radiography Broecke, van den 1998 Iliac bone crest harvest 3 cases, coring
technique, potential anatomic variation Hutchins 1998 Laparoscopic myomectomy Injury probably due to retroperitoneal dissection Schnatz 1999 Thigh injection with pain medication Post-cesarean, but intraoperative damage unlikely Butler 2002 Femoral artery cannulation for cardiac catheterization Medial course LFCN Polidori 2003 Laparoscopic
appendectomy LFCN damaged by insertion of trocar Rajabally 2003 Repeated laparotomies Bilateral case, scar tissue or due to retractors Ulkar 2003 Direct trauma to anterolateral part thigh during soccer Slightly decreased cutaneous sensation, provocative point on pressure distal to ASIS Blake 2004 Seat-belt injury Abrasion across chest extending
to anterolateral region hip Kavanagh 2005 Open appendicectomy Anatomical variation in course LFCN Kho 2005 Strenuous exercise 2 cases walking, 1 case cycling Paul 2006 Cesarian section Bilateral case, due to puling or manipulation Peters 2006 One case after total abdominal hysterectomy and one case post-cesarian Possible causes: lithotomy
position and pressure from self-retaining retractors Park 2007 Wear of hip-huggers for 2 years Lateral course of the LFCN (Aszmann type A) Otoshi 2008 Baseball Occurrence during pitching practice, intra-operatively LFCN pushed upward by a hard rim of the iliac fascia Stephenson 2008 Lateral positioning on a bean bag No soft contact layer
Hayashi 2011 Avulsion fracture of ASIS Sudden onset, positive Tinel's on percussing avulsed bony fragment of the ASIS Yi 2012 Traumatic iliacus hematoma in sprinter Diagnosed with US, confirmed with CT, treated conservatively Satin 2014 Beach chair
position for shoulder surgery 4 cases, compression by patient's abdominal pannus Lagueny 2015 Injection of glatiramer acetate for MS Lipoatrophy in proximal thigh and hyposensitivity in territory LFCN Omichi 2015 Prone positioning Distal entrapment underneath the fascia lata Arends 2016 Subcutaneous interferon alpha treatment Possible
neurotoxic effect Oh 2017 Femoral artery cannulation for cardiac catheterization Bilateral meralgia paresthetica Lee 2018 Sartorius muscle tear after jumping Hematoma surrounding the LFCN on US Marinelli 2020 Prone position ventilation For COVID-19 infection, bilateral Kot 2021 Placement and removal of pelvic fixator Conservatively treated
with US-guided injection of local anesthetics Kokubo 2022 Park-bench position Compression by fixture device Literature review of mass lesions clue(s) Flowers 1968 Retroperitoneal lipofibrosarcoma Continuous pain in thigh and to a lesser degree in the
lumbosacral region Good 1981 Bone bar after iliac bone graft harvest Bony bar formed 5 years after harvest with nerve passing through it Suber 1979 Uterine fibroid tumor compression nerve root L2 Rotenberg
1990 Pelvic inflammatory disease Bilasterale case Amoiridis 1993 Malignant tumor psoas Walking impossible due to intolerable increase in pain Brett 1997 Abdominal aortic aneurysm Sudden onset, back pain Tharion 1997 Metastasis in iliac crest Hard mass Trummer 2000 Lumbar disc herniation, extraforaminal L2-L3 Low back pain, advise MRI in
all patients with meralgia Yamamoto 2001 Hemangiomatosis Diffuse swelling around ASIS Yamamoto 2001 Heterotopic ossification 40 years after iliac bone graft harvesting Gupta 2003 Hip-joint synovial cyst Firm swelling in iliac fossa Ahmed 2010 Femoral acetabular impingement Discovered on MRI thigh Rau 2010 Lipoma Relief after excision
lipoma Yang 2010 L1 radiculopathy probably root L2, because of suspect disc S1-S2 on MRI Yi 2012 Iliacus hematoma Both femoral neuropathy and meralgia paresthetica Talwar 2012 Spinal hydatid Swelling back Ramirez Huaranga 2013 Renal tumor Large abdomen, mass on CT
Noh 2015 Pancreatic pseudocyst Abdominal pain, palpable mass Nishimura 2015 Appendicitis Prolonged fever, acute lymphoblastic leukemia Arabi 2015 Schwannoma at level L2 Improvement after tumor resection Magalhaes 2019 Pelvic osteochondroma Thickening of iliac bone at palpation Triplett 2019 Sartorius muscle fibrosis Treated with
cortisone injection Gencer Atalay 2020 Inguinal lymphadenopathy US-guided block with betamethasone and bupivacaine relieved pain Makris 2021 Extraforaminal disc herniation L2-L3 L2 radiculopathy Toscano 2021 Giant
hemorrhagic trochanteric bursitis Mobile mass lesion Iatrogenic injury is one the most frequently reported causes for traumatic injury of the LFCN. As already mentioned in the introduction complication rates have been described for the anterior approach for hip surgery, acetabular fractures, the harvest of iliac bone crest and inquinal hernia repair.
In the literature search we found additional articles describing cases after iliac crest bone harvest with the coring technique [8], laparoscopic inguinal herniorrhaphy [10], and after different intra-abdominal surgical procedures [11, 12]. Most frequently reported cause was pressure or traction on the nerve due to retractor placement [11, 13] or
manipulation [14, 15]. Other potential reported mechanisms of intraoperative injury were direct nerve injury were direct nerve injury were direct nerve injury due to retroperitoneal dissection [16], placement of a trocar [17] and placement of a trocar [17] and placement and removal of a pelvic fixator [18].
compression on the nerve by a fixture device [19], rotating tourniquet around the upper leg [20], positioning of the surgeons around the patient [21], prone positioning for gynecologic and obstetric procedures [15], frog-leg positioning for vein harvest during coronary bypass surgery
[24] and compression by patient's abdominal pannus in beach chair position for shoulder surgery [25]. In addition, we found several cases of needle injury, neurotoxic effect or from prolonged manual
duration wear of hip-huggers [41] and standing at attention [42]. Mass lesions causing symptoms of meralgia paresthetica were found along the entire course of the LFCN. Starting proximal, Rinkel et al. reported a case of meralgia paresthetica were found along the entire course of the LFCN. Starting proximal, Rinkel et al. reported a case of meralgia paresthetica were found along the entire course of the LFCN. Starting proximal, Rinkel et al. reported a case of meralgia paresthetica were found along the entire course of the LFCN. Starting proximal, Rinkel et al. reported a case of meralgia paresthetica were found along the entire course of the LFCN. Starting proximal, Rinkel et al. reported a case of meralgia paresthetica were found along the entire course of the LFCN. Starting proximal, Rinkel et al. reported a case of meralgia paresthetica were found along the entire course of the LFCN. Starting proximal, Rinkel et al. reported a case of meralgia paresthetica were found along the entire course of the LFCN. Starting proximal, Rinkel et al. reported a case of meralgia paresthetica were found along the entire course of the LFCN. Starting proximal, Rinkel et al. reported a case of meralgia paresthetica were found along the entire course of the LFCN. Starting proximal reported a case of meralgia paresthetica were found along the entire course of the LFCN. Starting proximal reported a case of meralgia paresthetica were found along the entire course of the LFCN. Starting proximal reported a case of meralgia paresthetica were found along the entire course of the LFCN. Starting proximal reported a case of meralgia paresthetica were found along the entire course of the LFCN. Starting proximal reported a case of meralgia paresthetica were found along the entire course of the LFCN. Starting proximal reported a case of meralgia paresthetica were found along the entire course of the LFCN. Starting proximal reported a case of meralgia paresthetica were found along the entire course of the LFCN. Starting proximal reported a c
of L2 root compression included (extraforaminal) disc herniation of L2-L3 [44-46] and a schwannoma of L2 [47]. More distal causes were a uterine fibroid tumor compressing the superior lumbar plexus [48], a malignant tumor in the psoas [49], a retroperitoneal lipofibrosarcoma [50], a renal tumor [51], a pancreatic pseudocyst [52], an abdominal
aortic aneurysm [53], a metastasis of the iliac crest [54], a synovial cyst in the iliac fossa [55] and a hematoma of the iliac muscle [38]. In addition, multiple causes of LFCN compression have been reported around the SIAS, including hemangiomatosis [56], heterotopic ossification [57, 58] and a pelvic osteochondroma [59]. Finally, multiple distal sites
of compression have been found to cause symptoms of meralgia paresthetica including lipoma/lipomatosis [60, 61], fibrosis of the sartorius muscle [62], inguinal lymphadenopathy [63], femoral acetabular impingement [64], giant hemorrhagic trochanteric bursitis [65] and a schwannoma inside the LFCN [66]. Besides cases with a cause of
compression along the course of the LFCN, also cases have been reported on more diffuse compression by increased intra-abdominal pressure: one bilateral case due to pelvic inflammatory disease [67] and one case after peritoneal dialysis [68]. Signs that pointed at an unusual cause for meralgia paresthetica were sudden onset of symptoms, sensory
disturbance outside distribution area of the LFCN, accompanying symptoms of back pain or fever or the presence of a swelling in the groin area. Other factors that raised suspicion were an oncologic history and continuous severe symptoms. Between April 1, 2014 and September 1, 2022 a total of 187 primary procedures were performed for meralgical factors.
paresthetica in our Center. Fourteen cases had a traumatic cause of meralgia paresthetica Traumatic cause Number of cases Interval traumatic cause Number of cas
Neurectomy (4) Complete pain relief in 2 cases; other 2 cases no effect Fixation acetabular fracture 1 5 yrs Type D variant Neurolysis Temporary pain relief in both cases; other 2 cases no effect Fixation acetabular fracture 1 5 yrs Type D variant Neurolysis Temporary pain relief in both cases; one case recurrence 7 years after neurectomy, complete pain relief following suprainguinal re-resection Bike accidents
2 5 yrs Neurexeresis (1), neurolysis (1) Partial pain relief after neurexeresis, no relief after neurolysis Inguinal hernia repair 2 6 mo 1 open: 1 scopic, anatomical variant (type E) Neurolysis (1), neurectomy (1) 1 good results after neurolysis, 1 recurrence of symptoms after neurolysis Vascular surgery for false aneurysm iliac artery 1 1.5 yrs
Neurectomy Almost complete pain relief Abdominal uterus extirpation 1 1 yr Neurolysis Complete pain relief after neurolysis followed by neurectomy No pain relief after neurolysis, complete pain relief after neurolysis followed by neurectomy No pain relief after neurolysis, complete pain relief after neurolysis followed by neurolysis followed 
followed by seat-belt injury (2), bike accidents (2) and inguinal hernia repair (2). In addition, we surgically treated several other cases of iatrogenic injury caused by procedures around the ASIS. Most remarkable finding was the long interval between trauma and referral. Further, there was a relatively high number of cases with an anatomical
variation in the course of the LFCN, most frequently a relatively medial course (type D and E according to the classification by Aszmann et al [1]). Overall, outcome after surgery was variable: neurectomy for traumatic cases, four cases of
meralgia paresthetica were identified caused by compression of the LFCN by a mass lesion. The separate cases are described below using the CARE guidelines [69]: A 41-year-old female was referred to our hospital, because of a tingling sensation in her right thigh to just below the knee that had lasted for half a year. In addition, she had noticed a
swelling in the anterolateral part of her right upper leg for several months. She had no relevant medical history. During neurologic examination the swelling itself was not painful, but pressure given on top of the lesion exacerbated the symptoms of meralgia paresthetica. An MRI scan was made of her right upper leg, which showed an oval, well-
circumscribed mass lesion of 10 mm inside the LFCN (Fig. 2A). She was operated in supine position. The lesion was localized with intraoperative ultrasound. A vertical incision was made over the localized with sparing of the
normal fascicles. Histopathologic analysis confirmed the diagnosis of a schwannoma. Three months after the surgery the patient had no more symptoms of meralgia paresthetica. She still had some numbness in the anterolateral part of her leg, but she was not bothered by this numbness. MRI showed no residual tumor. Case of schwannoma inside the
history of multiple lipomas was referred to our hospital, because of a burning sensation in the anterolateral part of his thigh. He had no relevant medical history and specifically no history of lipomatosis. An MRI scan was made, which showed a lipoma of 1-cm diameter inside the tensor fascia latae muscle (Fig. 3A). Intraoperatively the lipoma was
localized with ultrasound. A vertical incision was made in the skin on top of the lesion, and the distal branches of the LFCN were identified (Fig. 3B). Subsequently the fascia of the underlying tensor fascia latae muscle was opened, the lipoma was identified and resected. Histopathologic analysis confirmed the diagnosis of a lipoma. Three months after
the surgery the patient had complete relief of his pain symptoms. Case of lipoma inside the tensor fascia latae muscle (TFL) with high signal intensity comparable to that of subcutaneous fat (white arrow). The black arrow points at the branches
of the LFCN. B: Intra-operative image with white bands placed around the separate branches of the LFCN after opening of the fascia lata A 37-year-old woman with an 8-year history of meralgia paresthetica on the right side was referred with a lesion in her right L2 nerve root. She had been diagnosed with meralgia paresthetica 8 years ago. Her pain
symptoms had substantially increased over the last 2-3 years, which was the reason why the referring neurologist had ordered the MRI scan. This showed a lesion in the right L2 nerve root (Fig. 4A). The patient had no relevant medical history. During neurologic examination no abnormalities were found. She was operated in prone position under
general anesthesia. The lesion was exposed through a facetectomy L2-L3 on the right side (Fig. 4B). The sleeve of the nerve root and part of the dura was opened to expose the lesion and intradural filaments. The lesion could be resected totally by transecting the dorsal root filament with sparing of the ventral root filaments. The lesion could be resected totally by transecting the dorsal root filament with sparing of the ventral root filaments.
a Schwannoma. After the surgery she had no more pain symptoms in the anterolateral part of the thigh. She had decrease sensation in this area, but the numbness did not bother her. Postoperative MRI scans showed no residual or recurrent tumor up to 2 years after the surgery. L2 Case of L2 nerve root schwannoma: A and B: sagittal and transverse
T1-weighted MR images after gadolinium showing the schwannoma inside the L2 nerve root on the right side. C and D: intra-operative pictures showing the schwannoma before and after opening of the dura A 37-year-old woman with 5-year history of meralgia paresthetica on the left side was referred with a nodule on top of the left inguinal ligament
suspect for endometriosis. She had continuous pain symptoms, but the severity substantially increased menstruation (numeric rating score increased during these periods from 5 to 8). She had a history of endometriosis. During neurologic examination, the lesion could be palpated in her left groin, and pressure on the lesion increased her pain
symptoms. MRI scan (Fig. 5A) showed a medial course of the LFCN with compression by the nodule. Patient was operated through a suprainguinal approach. The lesion was identified on top of the inguinal ligament. After mobilization of the lesion, the underlying LFCN could be identified on top of the inguinal ligament. After mobilization of the lesion was identified on top of the inguinal approach. The lesion was identified on top of the inguinal ligament.
itself was not affected by the endometriosis. The lesion was totally removed (Fig. 5C). Patient experienced complete pain relief 3 months after surgical removal. Case of endometriosis in the groin area: A: Transverse T1-weighted image with gadolinium showing the endometriosis lesion (white arrow) inside the inguinal ligament. B: Intra-operative
image showing the LFCN (arrow) after mobilization of the endometriosis lesion. C: Picture of endometriosis lesion Although surgery is most frequently performed for idiopathic meralgia paresthetica [70], it is important to consider the possibility of a previous trauma or compression by a mass lesion in the evaluation of patients with meralgia
paresthetica and check for potential signs that may point at a traumatic cause or compression by a mass lesion. In this article we reviewed the literature and presented our own experience with the surgical treatment of traumatic causes of meralgia and cases caused by compression due to mass lesions. For clarity reasons we will discuss these two
categories separately below. As we expected, iatrogenic injury was the most frequently reported traumatic cause for LFCN injury, we found several cases of meralgia after intra-abdominal procedures performed both through an open and
laparoscopic approach. Several pathophysiologic mechanisms for injury have been reported including direct injury to the LFNC, for example during retroperitoneal dissection [16] or due to insertion of the trocar [17], or indirect injury due to manipulation or retraction by surgical blades [11]. The latter explanation is also supported by the finding of
bilateral meralgia in 2 cases after laparotomy [13 14]. Other mechanisms that were mentioned included increased abdominal pressure (due to induced pneumoperitoneum [21]) and positioning of the patient, such as extreme lithotomy position [15]. In this study we did not include all studies on the effect of surgical positioning, because most studies most studies on the effect of surgical positioning of the patient, such as extreme lithotomy position [15].
concern series without description of the individual cases. Potential causes mentioned in these articles include pannicular traction at the inguinal ligament, extreme flexion of the hips or direct compression by a fixture device [19]. Unfortunately, the LFCN is not mentioned in these articles include pannicular traction at the inguinal ligament, extreme flexion of the hips or direct compression by a fixture device [19].
Neuropathies [71], probably because of the low incidence and the fact that is often self-limiting (53% of the symptoms recover within first week after spine surgery, and every patient within 2 months [72]). Nevertheless, we feel that more awareness should be raised for the potential complication of meralgia paresthetica after positioning for different
surgical procedures both for patient education and adequate conservative treatment. Furthermore, our literature review showed several iatrogenic cases after femoral artery cannulation and needle injury either caused by direct injury of the needle, neurotoxic effect of the injected drug and/or compression after removal of the needle or cannula for
hemostasis. Finally, several cases have been reported of traumatic meralgia paresthetica and the trauma may be regarded as predisposing rather than as direct cause, sometimes there was clear relation between the occurrence
of symptoms and a certain activity. Otoshi et al. for example reported a case of meralgia paresthetica in baseball player and hypothesized that injury to the nerve was caused by contraction of the iliac muscles during pitching motion [40]. Other cases have been reported after training on a leg press [73], extensive walking and cycling [2] and long
duration of standing at attention [42]. Direct impact on the anterolateral part of the thigh may also lead to symptoms of meralgia paresthetica, as for example shown by the case of Ulkar et al., who found symptoms of meralgia paresthetica, as for example shown by the case of Ulkar et al., who found symptoms of meralgia paresthetica, as for example shown by the case of Ulkar et al., who found symptoms of meralgia paresthetica, as for example shown by the case of Ulkar et al., who found symptoms of meralgia paresthetica, as for example shown by the case of Ulkar et al., who found symptoms of meralgia paresthetica, as for example shown by the case of Ulkar et al., who found symptoms of meralgia paresthetica, as for example shown by the case of Ulkar et al., who found symptoms of meralgia paresthetica, as for example shown by the case of Ulkar et al., who found symptoms of meralgia paresthetica, as for example shown by the case of Ulkar et al., who found symptoms of meralgia paresthetica, as for example shown by the case of Ulkar et al., who found symptoms of meralgia paresthetica, as for example shown by the case of Ulkar et al., who found symptoms of meralgia paresthetica, as for example shown by the case of Ulkar et al., who found symptoms of the Ulkar et al., who fo
makes the nerve more vulnerable to injury (as seen in the case by Park et al [41]). Specific attention should be paid to a potential distal injury at the site where the branch(es) pierce the fascia lata to innervate the skin [23]. In our own series of 14 traumatic cases, we also observed the types of injury that are most frequently reported in the literature
including the anterior approach for hip surgery (4 cases), inguinal hernia repair (2 cases) and seat-belt injury (2 cases). Interestingly, we also operated two cases of injury after bicycle accidents, which can be explained by the frequent use of bicycles for transportation in the Netherlands [74]. Overall, outcome after surgery in our small series was
variable. Neurectomy of the LFCN after traumatic injury for anterior hip surgery resulted in pain relief in only half of the cases. This could be due to referral bias, because transection injury was most frequently observed in our cases, whereas Goulding et al. found that most injury so most frequently observed in our cases, whereas Goulding et al. found that most injury was most frequently observed in our cases, whereas Goulding et al. found that most injury was most frequently observed in our cases.
[75]. In the literature there are only a few articles in which surgical results for traumatic cases have been described and the series are heterogenous with often different traumatic cases have been described and the series are heterogenous with often different traumatic cases have been described and the series are heterogenous with often different traumatic cases have been described and the series are heterogenous with often different traumatic cases have been described and the series are heterogenous with often different traumatic cases have been described and the series are heterogenous with often different traumatic cases have been described and the series are heterogenous with often different traumatic cases have been described and the series are heterogenous with often different traumatic cases have been described and the series are heterogenous with often different traumatic cases have been described and the series are heterogenous with often different traumatic cases have been described and the series are heterogenous with often different traumatic cases have been described and the series are heterogenous with often different traumatic cases have been described and the series are heterogenous with often different traumatic cases have been described and the series are heterogenous with often different traumatic cases have been described and the series are heterogenous with often different traumatic cases have been described and the series are heterogenous with often different traumatic cases have been described and the series are heterogenous with often different traumatic cases have been described and the series are heterogenous with often different traumatic cases have been described and the series are heterogenous with often different traumatic cases have been described and the series are heterogenous with often different traumatic cases have been described and the series are heterogenous with the series
injury and preferably perform additional analysis with ultrasound pre-operatively, also to investigated potential hematoma, muscle tear and /or avulsion of a fragment of the ASIS. We suspect that traumatic injuries of the LFNC are frequently missed. In addition, we observed a substantial delay in the referral of these patients. After seat-belt injury for
example (where the LFCN is vulnerable at the site where the seat belt runs just caudal to the ASIS and sudden deceleration of the nerve). As was shown in the case by Blake and Treble [32], abrasion across the chest extending to the anterolateral region of the hip may point at
this, although these abrasions may not always be found and, as in our experience, patients are often referred years after the injury has occurred. The most frequently reported finding from our series of traumatic cases was a relatively medial course of the LFCN. In the classification by Aszmann et al. this type is referred to as type D and E [1]. It could
be that the more lateral course, where the nerve runs just medial to the ASIS (type B and C), protects the LFCN from injury or that surgeons are not aware of potential medial course of the nerve. More studies, as the one by Broin et al. [9], are needed to investigate safe margins for different procedures. Moreover, because medial variants may also be
injured after femoral artery cannulation, it is important to realize that digital compression and the use compression devices [30] can lead to LFCN injury, and possibly, preventive measures such as the use of vascular closure device may prevent this complication [31]. Besides the more frequently reported traumatic causes of meralgia paresthetica, we
also found several unusual causes, including nerve injury after heparin injection, vascular surgery for a false aneurysm of the iliac artery, abdominal uterus extirpation and fixation of an acetabular fracture. As expected for unusual cases, there was often a referral bias, and multiple scans had been performed before the patient was referred. In our
experience it is helpful in these cases to perform analysis with ultrasound to investigate the possibility of a neuroma, hematoma or fibrosis. In addition, pressure with the probe of the US over the area of the injury may provoke symptoms (sonopalpation), which may also point at a traumatic mechanism of injury. Our literature review shows that
potential causes of compression can be found anywhere along the course of the LFCN. Proximally several lesions were found that presented with symptoms of meralgia paresthetica, often accompanied by back pain, which pointed at another potential cause than idiopathic meralgia paresthetica. Lumbar radiculopathy of L2 or L3 is probably the most
 important differential diagnosis of meralgia paresthetica. Yang et al. reported a case of L1 radiculopathy mimicking meralgia paresthetica caused by L1-L2 intervertebral disc herniation, but the MRI in their figure suggests a rudimentary disc S1-S2, and we question whether in that case the affected level was in fact L2-L3 [46]. Some authors
recommend MRI to exclude a potential compression at the spinal level in all patients with meralgia paresthetica [44]. We would suggest to at least perform MRI in the presence of radicular pain symptoms (rather than dysesthesia which is often observed in meralgia), accompanying backpain, extension of the symptoms outside the distribution area of
the LFCN and in case additional work-up for meralgia paresthetica is normal (no increased surface area of the LFCN on US or intraneural edema) and if there is no response to local nerve block. Other clues that may point at another cause noted in the literature were an oncologic history, abnormal presentation (continuous severe symptoms or short
duration), swelling around the ASIS or intra-abdominal swelling. Some articles have reported the occurrence of meralgia following pelvic inflammatory disease. The exact pathophysiologic mechanism in these cases remains unclear, but it may be explained by extension of the intra-abdominal contention and secondary compression of the LFCN
Another explanation could be inguinal lymphadenopathy [63]. In our experience ultrasound (US) is helpful to rule other mass lesions around the ASIS. Another advantage of US is that it can be used preoperatively to determine the anatomical variant in the course of the LFCN in relation to the ASIS [78]. In our surgical series we found 4 cases of
previously [60 61]: one case was treated surgically [60] and one case by injection of triamcinolone and lidocaine [61]. To the best of our knowledge no other cases have been reported on cyclic symptoms of meralgia paresthetica related to menstruation due to endometriosis. In our case symptoms were caused by direct compression of the
endometriosis lesion at the inguinal ligament. Although these causes are rare, in our opinion it is important to rule out a potential alternative cause, especially when there are accompanying signs such back pain, swelling in the groin or the anterolateral part of the thigh or a history of schwannomatosis, lipomatosis or endometriosis. As our literature
review shows there are multiple iatrogenic and other trauma mechanism is not recognized and patients are referred with a substantial delay. More awareness should be raised for potential occurrence of meralgia
paresthetica after positioning for surgery, including prone-positioning for spine surgery. Our literature review also shows that meralgia paresthetica can be caused by mass lesions all along the course of the LFCN, starting from the nerve root L2/L3 up to the distal branches of the LFCN to the skin. Accompanying signs such as atypical presentation
(sudden onset, severe pain), accompanying symptoms (back pain), local swelling in the groin area and an oncologic history may point at an alternative cause. Ultrasound can be performed to investigate structural abnormalities around the ASIS. Additional work-up (including MRI of the lumbar spine) should be performed in case of suspicion of L2 or
L3 nerve root compression. Details can be requested from the corresponding author, but restricted to the guidelines and only with permission from the Medical Ethical Committee South-West Netherlands. GdR selected and read all articles, wrote the manuscript (including the case descriptions), reviewed the final version and revised the manuscript (including the case descriptions).
according to the comments by the reviewed the first and revised version of the manuscript. TV participated in the literature search and reviewed the revised version of the manuscript. Ethical approval was obtained from the Medical
Ethical Committee from the South-West Netherlands and from the board of the Haaglanden Medical Center. The authors declare no competing interests. 1. Aszmann OC, Dellon ES, Dellon AL. Anatomical course of the lateral femoral cutaneous nerve and its susceptibility to compression and injury. Plast Reconstr Surg. 1997;100(3):600-604. doi
10.1097/00006534-199709000-00008. [DOI] [PubMed] [Google Scholar] 2.Kho KH, Blijham PJ, Zwarts MJ. Meralgia paresthetica after strenuous exercise. Muscle Nerve. 2005;31(6):761-763. doi: 10.1002/mus.20271. [DOI] [PubMed] [Google Scholar] 3.Nahabedian MY, Dellon AL. Meralgia paresthetica: etiology, diagnosis, and outcome of surgical
decompression. Ann Plast Surg. 1995;35(6):590-594. doi: 10.1097/00000637-199512000-00006. [DOI] [PubMed] [Google Scholar] 4.Yoshida S, Oya S, Matsui T. Risk factors of meralgia paresthetica after prone position surgery: possible influence of operating position, laminectomy level, and preoperative thoracic kyphosis. J Clin Neurosci.
2021;89:292-296. doi: 10.1016/j.jocn.2021.05.022. [DOI] [PubMed] [Google Scholar] 5.Dahm F, Aichmair A, Dominkus M, Hofstaetter JG. Incidence of lateral femoral cutaneous nerve lesions after direct anterior approach primary total hip arthroplasty—a literature review. Orthop Traumatol Surg Res. 2021;107(8):102956. doi:
10.1016/j.otsr.2021.102956. [DOI] [PubMed] [Google Scholar] 6.Lao A, Putman S, Soenen M, Migaud H. The ilio-psoas muscle and complications in 24 consecutive patients. Orthop Traumatol Surg Res. 2014;100(4):375–378. doi: 10.1016/j.otsr.2014.02.006. [DOI]
[PubMed] [Google Scholar] 7.Murata Y, Takahashi K, Yamagata M, Shimada Y, Moriya H. The anatomy of the lateral femoral cutaneous nerve, with special reference to the harvesting of iliac bone graft. J Bone Joint Surg Am. 2000;82(5):746-747. doi: 10.2106/00004623-200005000-00016. [DOI] [PubMed] [Google Scholar] 8.van den Broecke DG,
Schuurman AH, Borg ED, Kon M. Neurotmesis of the lateral femoral cutaneous nerve when coring for iliac crest bone grafts. Plast Reconstr Surg. 1998;102(4):1163-1166. doi: 10.1097/00006534-199809040-00038. [DOI] [PubMed] [Google Scholar] 9.Broin EO, Horner C, Mealy K, et al. Meralgia paraesthetica following laparoscopic inquinal hernia
repair: An anatomical analysis. Surg Endosc. 1995;9(1):76-78. doi: 10.1007/BF00187893. [DOI] [PubMed] [Google Scholar] 11.Grace DM.
Meralgia paresthetica after gastroplasty for morbid obesity. Can J Surg. 1987;30(1):64-65. [PubMed] [Google Scholar] 12.Kavanagh D, Connolly S, Fleming F, Hill AD, McDermott EW, O'Higgens NJ. Meralgia paraesthetica following open appendicectomy. Ir Med J. 2005;98(6):183-185. [PubMed] [Google Scholar] 13.Rajabally YA, Farrell D. Bilateral
meralgia paraesthetica following repeated laparotomies. Eur J Neurol. 2003;10(3):330-331. doi: 10.1046/j.1468-1331.2003.00581.x. [DOI] [PubMed] [Google Scholar] 14.Paul F, Zipp F. Bilateral meralgia paresthetica after cesarian section with epidural analgesia. J Peripher Nerv Syst. 2006;11(1):98-99. doi: 10.1111/j.1085-9489.2006.00073.x. [DOI]
[PubMed] [Google Scholar] 15.Peters G, Larner AJ. Meralgia paresthetica following gynecologic and obstetric surgery. Int J Gynaecol Obstet. 2006;95(1):42-43. doi: 10.1016/j.ijgo.2006.05.025. [DOI] [PubMed] [Google Scholar] 16.Hutchins FL, Jr, Huggins J, Delaney ML. Laparoscopic myomectomy—an unusual cause of meralgia paresthetica. J Am
Assoc Gynecol Laparosc. 1998;5(3):309-311. doi: 10.1016/s1074-3804(98)80039-x. [DOI] [PubMed] [Google Scholar] 17.Polidori L, Magarelli M, Tramutoli R. Meralgia paresthetica as a complication of laparoscopic appendectomy. Surg Endosc. 2003;17(5):832. doi: 10.1007/s00464-002-4279-1. [DOI] [PubMed] [Google Scholar] 18.Kot P, Rubio-Haro R,
Bordes-Garcia C, Ferrer-Gomez C, De Andres J. Meralgia paresthetica after pelvic fixation in a polytrauma patient. Korean J Anesthesiol. 2021;74(6):555-556. doi: 10.4097/kja.21065. [DOI] [PMC free article] [PubMed] [Google Scholar] 19.Kokubo R, Kim K, Umeoka K, Isu T, Morita A. Meralgia paresthetica caused by surgery in the park-bench
position. J Nippon Med Sch. 2022;89(3):355-357. doi: 10.1272/jnms.JNMS.2022_89-112. [DOI] [PubMed] [Google Scholar] 21.Yamout B, Tayyim
A, Farhat W. Meralgia paraesthetica as a complication of laparoscopic cholecystectomy. Clin Neurol Neurosurg. 1994;96(2):143-144. doi: 10.1016/0303-8467(94)90048-5. [DOI] [PubMed] [Google Scholar] 22.Marinelli L, Mori L, Avanti C, et al. Meralgia paraesthetica after prone position ventilation in a patient with COVID-19. Eur J Case Rep Intern
Med. 2020;7(12):002039. doi: 10.12890/2020 002039. [DOI] [PMC free article] [PubMed] [Google Scholar] 23.Omichi Y, Tonogai I, Kaji S, Sangawa T, Sairyo K. Meralgia paresthetica caused by entrapment of the lateral femoral subcutaneous nerve at the fascia lata of the thigh: a case report and literature review. J Med Invest. 2015;62(3-4):248-250.
doi: 10.2152/jmi.62.248. [DOI] [PubMed] [Google Scholar] 24.Parsonnet V, Karasakalides A, Gielchinsky I, Hochberg M, Hussain SM. Meralgia paresthetica after coronary bypass surgery. J Thorac Cardiovasc Surg. 1991;101(2):219–221. doi: 10.1016/S0022-5223(19)36755-8. [DOI] [PubMed] [Google Scholar] 25.Satin AM, DePalma AA, Cuellar J
 Gruson KI. Lateral femoral cutaneous nerve palsy following shoulder surgery in the beach chair position: a report of 4 cases. Am J Orthop (Belle Mead NJ) 2014;43(9):E206-E209. [PubMed] [Google Scholar] 26. Auriacombe M, Dhopesh V, Yagnik P. Meralgia paresthetica syringectica. JAMA. 1991;265(21):2807-2808. doi:
10.1001/jama.1991.03460210053015. [DOI] [PubMed] [Google Scholar] 27.Schnatz P, Wax JR, Steinfeld JD, Ingardia CJ. Meralgia paresthetica: an unusual complication of post-cesarean analgesia. J Clin Anesth. 1999;11(5):416-418. doi: 10.1016/s0952-8180(99)00066-5. [DOI] [PubMed] [Google Scholar] 28.Lagueny A, Ouallet JC. Meralgia
paresthetica after subcutaneous injection of glatiramer acetate. Muscle Nerve. 2015;52(1):150-151. doi: 10.1002/mus.24614. [DOI] [PubMed] [Google Scholar] 29. Arends S, Wirtz PW. Meralgia paresthetica in subcutaneous interferon alpha treatment. J Clin Neuromuscul Dis. 2016;18(1):44. doi: 10.1097/CND.00000000000125. [DOI] [PubMed]
[Google Scholar] 30.Butler R, Webster MW. Meralgia paresthetica: an unusual complication of cardiac catheterization via the femoral artery. Catheter Cardiovasc Interv. 2002;56(1):69-71. doi: 10.1002/ccd.10149. [DOI] [PubMed] [Google Scholar] 31.Oh SI, Kim EG, Kim SJ. An unusual case of bilateral meralgia paresthetica following femoral
cannulations. Neurointervention. 2017;12(2):122-124. doi: 10.1308/14787080456. [DOI] [PMC free article] [PubMed] [Google Scholar] 32.Blake SM, Treble NJ. Meralgia paraesthetica—an addition to 'seatbelt syndrome'. Ann R Coll Surg Engl. 2004;86(6):W6-W7. doi: 10.1308/14787080456. [DOI] [PMC free article] [PubMed] [Google Scholar] 32.Blake SM, Treble NJ. Meralgia paraesthetica—an addition to 'seatbelt syndrome'.
Scholar] 33. Buch KA, Campbell J. Acute onset meralgia paraesthetica after fracture of the anterior superior iliac spine. Injury. 1993;24(8):569-570. doi: 10.1016/0020-1383(93)90043-6. [DOI] [PubMed] [Google Scholar] 34. Thankachalam M, Petros IG, O'Donnell S. Avulsion fracture of the anterior superior iliac spine presenting as acute-onset
meralgia paresthetica. Ann Emerg Med. 1995;26(4):515-517. doi: 10.1016/s0196-0644(95)70122-2. [DOI] [PubMed] [Google Scholar] 35. Hayashi S, Nishiyama T, Fujishiro T, Kanzaki N, Kurosaka M. Avulsion-fracture of the anterior superior iliac spine with meralgia paresthetica: a case report. J Orthop Surg (Hong Kong) 2011;19(3):384-385. doi:
10.1177/230949901101900327. [DOI] [PubMed] [Google Scholar] 36.Hsu CY, Wu CM, Lin SW, Cheng KL. Anterior superior iliac spine avulsion fracture presenting as meralgia paraesthetica in an adolescent sprinter. J Rehabil Med. 2014;46(2):188–190. doi: 10.2340/16501977-1247. [DOI] [PubMed] [Google Scholar] 37.Lee B, Stubbs E. Sartorius
muscle tear presenting as acute meralgia paresthetica. Clin Imaging. 2018;51:209-212. doi: 10.1016/j.clinimag.2018.05.011. [DOI] [PubMed] [Google Scholar] 38.Yi TI, Yoon TH, Kim JS, Lee GE, Kim BR. Femoral neuropathy and meralgia paresthetica secondary to an iliacus hematoma. Ann Rehabil Med. 2012;36(2):273-277. doi:
10.5535/arm.2012.36.2.273. [DOI] [PMC free article] [PubMed] [Google Scholar] 39.Ulkar B, Yildiz Y, Kunduracioglu B. Meralgia paresthetica: a long-standing performance-limiting cause of anterior thigh pain in a soccer player. Am J Sports Med. 2003;31(5):787-789. doi: 10.1177/03635465030310052601. [DOI] [PubMed] [Google Scholar] 40.Otoshi
K, Itoh Y, Tsujino A, Kikuchi S. Case report: meralgia paresthetica in a baseball pitcher. Clin Orthop Relat Res. 2008;466(9):2268-2270. doi: 10.1007/s11999-008-0307-3. [DOI] [PMC free article] [PubMed] [Google Scholar] 41.Park JW, Kim DH, Hwang M, Bun HR. Meralgia paresthetica caused by hip-huggers in a patient with aberrant course of the
lateral femoral cutaneous nerve. Muscle Nerve. 2007;35(5):678-680. doi: 10.1002/mus.20721. [DOI] [PubMed] [Google Scholar] 42.Massey EW. Meralgia paraesthetica. An unusual case. JAMA. 1977;237(11):1125-1126. doi: 10.1001/jama.1977.03270380069026. [DOI] [PubMed] [Google Scholar] 43.Rinkel GJ, Wokke JH. Meralgia paraesthetica as the
first symptom of a metastatic tumor in the lumbar spine. Clin Neurol Neurosurg. 1990;92(4):365-367. doi: 10.1016/0303-8467(90)90067-f. [DOI] [PubMed] [Google Scholar] 44.Trummer M, Flaschka G, Unger F, Eustacchio S. Lumbar disc herniation mimicking meralgia paresthetica: case report. Surg Neurol. 2000;54(1):80-81. doi: 10.1016/s0090-
3019(00)00264-0. [DOI] [PubMed] [Google Scholar] 45.Seror P. Meralgia paresthetica related to L2 root entrapment. Muscle Nerve. 2010;41(4):566-568. doi:
10.1002/mus.21601. [DOI] [PubMed] [Google Scholar] 47.Arabi H, Khalfaoui S, El Bouchti I, et al. Meralgia paresthetica with lumbar neurinoma: case report. Ann Phys Rehabil Med. 2015;58(6):359-361. doi: 10.1016/j.rehab.2015.07.389. [DOI] [PubMed] [Google Scholar] 48.Suber DA, Massey EW. Pelvic mass presenting as meralgia paresthetica.
Obstet Gynecol. 1979;53(2):257-258. [PubMed] [Google Scholar] 49. Amoiridis G, Wohrle J, Grunwald I, Przuntek H. Malignant tumour of the psoas: another cause of meralgia paraesthetica. A clue to retroperitoneal malignant
tumor. Am J Surg. 1968;116(1):89-92. doi: 10.1016/0002-9610(68)90423-6. [DOI] [PubMed] [Google Scholar] 51.Ramirez Huaranga MA, Ariza Hernandez A, Ramos Rodriguez CC, Gonzalez GJ. What meralgia paresthetica can hide: renal tumor as an infrequent cause. Reumatol Clin. 2013;9(5):319-321. doi: 10.1016/j.reuma.2012.09.007. [DOI]
[PubMed] [Google Scholar] 52.Noh KH, Kim DS, Shin JH. Meralgia paresthetica caused by a pancreatic pseudocyst. Muscle Nerve. 2015;52(4):684-685. doi: 10.1002/mus.24701. [DOI] [PubMed] [Google Scholar] 53.Brett A, Hodgetts T. Abdominal aortic aneurysm presenting as meralgia paraesthetica. J Accid Emerg Med. 1997;14(1):49-51. doi: 10.1002/mus.24701. [DOI] [PubMed] [Google Scholar] 53.Brett A, Hodgetts T. Abdominal aortic aneurysm presenting as meralgia paraesthetica. J Accid Emerg Med. 1997;14(1):49-51. doi: 10.1002/mus.24701. [DOI] [PubMed] [Google Scholar] 53.Brett A, Hodgetts T. Abdominal aortic aneurysm presenting as meralgia paraesthetica. J Accid Emerg Med. 1997;14(1):49-51. doi: 10.1002/mus.24701. [DOI] [PubMed] [Google Scholar] 53.Brett A, Hodgetts T. Abdominal aortic aneurysm presenting as meralgia paraesthetica. J Accid Emerg Med. 1997;14(1):49-51. doi: 10.1002/mus.24701. [DOI] [PubMed] [Google Scholar] 53.Brett A, Hodgetts T. Abdominal aortic aneurysm presenting as meralgia paraesthetica. J Accid Emerg Med. 1997;14(1):49-51. doi: 10.1002/mus.24701. [DOI] [PubMed] [Google Scholar] 53.Brett A, Hodgetts T. Abdominal aortic aneurysm presenting as meralgia paraesthetica. J Accid Emerg Med. 1997;14(1):49-51. doi: 10.1002/mus.24701. [DOI] [PubMed] [Google Scholar] 53.Brett A, Hodgetts T. Abdominal aortic aneurysm presenting as meralgia paraesthetica. J Accid Emerg Med. 1997;14(1):49-51. doi: 10.1002/mus.24701. [DOI] [PubMed] [Google Scholar] 53.Brett A, Hodgetts T. Abdominal aortic aneurysm presenting as meralgia paraesthetica. J Accid Emerg Med. 1997;14(1):49-51. doi: 10.1002/mus.24701. [DOI] [PubMed] [Google Scholar] 53.Brett A, Hodgetts T. Abdominal aortic aneurysm presenting as meralgia paraesthetica. J Accid Emerg Med. 1997;14(1):49-51. doi: 10.1002/mus.24701. [DOI] [PubMed] [Google Scholar] 53.Brett A, Hodgetts T. Abdominal aortic aneurysm presenting as meralgia paraesthetic aneurysm presenting as meralgia paraesthetic aneurysm presenting aneurysm presenting aneurysm presenting aneurysm presenting aneur
10.1136/emj.14.1.49. [DOI] [PMC free article] [PubMed] [Google Scholar] 54. Tharion G, Bhattacharji S. Malignant secondary deposit in the iliac crest masquerading as meralgia paresthetica. Arch Phys Med Rehabil. 1997;78(9):1010–1011. doi: 10.1016/s0003-9993(97)90067-8. [DOI] [PubMed] [Google Scholar] 55. Gupta R, Stafford S, Cox N. Unusual
cause of meralgia paraesthetica. Rheumatology (Oxford) 2003;42(8):1005. doi: 10.1093/rheumatology/keg241. [DOI] [PubMed] [Google Scholar] 56.Yamamoto T, Kurosaka M, Marui T, Mizuno K. Hemangiomatosis presenting as meralgia paresthetica. J Pediatr Surg. 2001;36(3):518-520. doi: 10.1053/jpsu.2001.21624. [DOI] [PubMed] [Google Scholar]
57. Yamamoto T, Nagira K, Kurosaka M. Meralgia paresthetica occurring 40 years after iliac bone graft harvesting: case report. Neurosurgery. 2001;49(6):1455–1457. doi: 10.1097/00006123-200112000-00028. [DOI] [PubMed] [Google Scholar] 58. Good CJ. Meralgia paraesthetica as a complication of bone graft harvesting: case report. Neurosurgery. 2001;49(6):1455–1457. doi: 10.1097/00006123-200112000-00028. [DOI] [PubMed] [Google Scholar] 58. Good CJ. Meralgia paraesthetica as a complication of bone graft harvesting: case report. Neurosurgery. 2001;49(6):1455–1457. doi: 10.1097/00006123-200112000-00028. [DOI] [PubMed] [Google Scholar] 58. Good CJ. Meralgia paraesthetica as a complication of bone graft harvesting: case report. Neurosurgery. 2001;49(6):1455–1457. doi: 10.1097/00006123-200112000-00028. [DOI] [PubMed] [Google Scholar] 58. Good CJ. Meralgia paraesthetica as a complication of bone graft harvesting: case report. Neurosurgery. 2001;49(6):1455–1457. doi: 10.1097/00006123-200112000-00028. [DOI] [PubMed] [Google Scholar] 58. Good CJ. Meralgia paraesthetica as a complication of bone graft harvesting: case report. Neurosurgery. 2001;49(6):1455–1457. doi: 10.1097/00006123-200112000-00028. [DOI] [PubMed] [Google Scholar] 58. Good CJ. Meralgia paraesthetica as a complication of bone graft harvesting: case report. Neurosurgery. 2001;49(6):1455–1457. doi: 10.1097/00006123-200112000-00028. [DOI] [PubMed] [Google Scholar] 58. Good CJ. Meralgia paraesthetica as a complication of bone graft harvesting as a complex of the com
10.1016/0020-1383(81)90253-9. [DOI] [PubMed] [Google Scholar] 59.BM LV, Massardi FR, SA CP Pelvic osteochondroma causing meralgia paresthetica. Neurol India. 2019;67(3):928-929. doi: 10.4103/0028-3886.263206. [DOI] [PubMed] [Google Scholar] 60.Rau CS, Hsieh CH, Liu YW, Wang LY, Cheng MH. Meralgia paresthetica secondary to
lipoma. J Neurosurg Spine. 2010;12(1):103-105. doi: 10.3171/2009.7.SPINE08622. [DOI] [PubMed] [Google Scholar] 61.Ganhao S, Uson J. Meralgia paresthetica secondary to underlying lipomatosis: an unusual case. J Clin Rheumatol. 2021;27(7):S836-SS37. doi: 10.1097/RHU.0000000000001403. [DOI] [PubMed] [Google Scholar] 62.Triplett JD,
Robertson A, Yiannikas C. Compressive lateral femoral cutaneous neuropathy secondary to sartorius muscle fibrosis. JAMA Neurol. 2019;76(1):109-110. doi: 10.1001/jamaneurol.2018.2955. [DOI] [PubMed] [Google Scholar] 63.Gencer Atalay K, Giray E, Yolcu G, Yagci I. Meralgia paresthetica caused by inguinal lymphadenopathy related to tinea pedis
infection: a case report. Turk J Phys Med Rehabil. 2020;66(4):473-475. doi: 10.5606/tftrd.2020.4459. [DOI] [PMC free article] [PubMed] [Google Scholar] 64.Ahmed A. Meralgia paresthetica and femoral acetabular impingement: a possible association. J Clin Med Res. 2010;2(6):274-276. doi: 10.4021/jocmr468w. [DOI] [PMC free article] [PubMed]
[Google Scholar] 65.Toscano A, Costa GG, Rocchi M, Saracco A, Pignatti G. Giant hemorrhagic trochanteric bursitis mimicking a high-grade soft tissue sarcoma: report of two cases. Acta Biomed. 2021;92(S1):e2021043. doi: 10.23750/abm.v92iS1.9151. [DOI] [PMC free article] [PubMed] [Google Scholar] 66.Makris AP, Makris D. Schwannoma of the
lateral femoral cutaneous nerve, an unusual cause of meralgia paresthetica associated with pelvic inflammatory disease. CMAJ. 1990;142(1):42-43. [PMC free article] [PubMed] [Google Scholar] 67. Rotenberg AS. Bilateral meralgia paresthetica associated with pelvic inflammatory disease. CMAJ. 1990;142(1):42-43. [PMC free article] [PubMed] [Google Scholar] 67. Rotenberg AS. Bilateral meralgia paresthetica associated with pelvic inflammatory disease. CMAJ. 1990;142(1):42-43. [PMC free article] [PubMed] [Google Scholar] 67. Rotenberg AS. Bilateral meralgia paresthetica associated with pelvic inflammatory disease. CMAJ. 1990;142(1):42-43. [PMC free article] [PubMed] [Google Scholar] 67. Rotenberg AS. Bilateral meralgia paresthetica associated with pelvic inflammatory disease. CMAJ. 1990;142(1):42-43. [PMC free article] [PubMed] [Google Scholar] 67. Rotenberg AS. Bilateral meralgia paresthetica associated with pelvic inflammatory disease. CMAJ. 1990;142(1):42-43. [PMC free article] [PubMed] [Google Scholar] 67. Rotenberg AS. Bilateral meralgia paresthetica associated with pelvic inflammatory disease. CMAJ. 1990;142(1):42-43. [PMC free article] [PubMed] [Google Scholar] 67. Rotenberg AS. Bilateral meralgia paresthetica associated with pelvic inflammatory disease. CMAJ. 1990;142(1):42-43. [PMC free article] [PubMed] [Google Scholar] 67. Rotenberg AS. Bilateral meralgia paresthetica associated with pelvic inflammatory disease. CMAJ. 1990;142(1):42-43. [PMC free article] [PubMed] [Google Scholar] 67. Rotenberg AS. Bilateral meralgia paresthetica associated with pelvic inflammatory disease. CMAJ. 1990;142(1):42-43. [PMC free article] [PMC free article
free article] [PubMed] [Google Scholar] 68.Talwar A, Baharani J (2012) Meralgia paraesthetica: an unusual complication in peritoneal dialysis. BMJ Case Rep 2012:1-2. 10.1136/bcr.01.2012.5590 [DOI] [PMC free article] [PubMed] 69.Gagnier JJ, Kienle G, Altman DG et al (2013) The CARE guidelines: consensus-based clinical case reporting guideline
development. BMJ Case Rep 2013:1-4. 10.1136/bcr-2013-201554 [DOI] [PMC free article] [PubMed] 70.Lu VM, Burks SS, Heath RN, Wolde T, Spinner RJ, Levi AD (2021) Meralgia paresthetica treated by injection, decompression, and neurectomy: a systematic review and meta-analysis of pain and operative outcomes. J Neurosurg:1-11.
10.3171/2020.7.JNS202191 [DOI] [PubMed] 71.Apfelbaum JL, Agarkar M, Connis RT, et al. an updated Report by the American Society of Anesthesiology. 2018;128(1):11-26. doi: 10.1097/ALN.000000000001937. [DOI] [PubMed] [Google Scholar] 72.Yang SH, Wu
CC, Chen PQ. Postoperative meralgia paresthetica after posterior spine surgery: incidence, risk factors, and clinical outcomes. Spine (Phila Pa 1976) 2005;30(18):E547-E550. doi: 10.1097/01.brs.0000178821.14102.9d. [DOI] [PubMed] [Google Scholar] 73. Szewczyk J, Hoffmann M, Kabelis J. Meralgia paraesthetica in a body-builder. Sportverletz
Sportschaden. 1994;8(1):43-45. doi: 10.1055/s-2007-993452. [DOI] [PubMed] [Google Scholar] 74.de Guerre L, Sadiqi S, Leenen LPH, Oner CF, van Gaalen SM. Injuries related to bicycle accidents: an epidemiological study in The Netherlands. Eur J Trauma Emerg Surg. 2020;46(2):413-418. doi: 10.1007/s00068-018-1033-5. [DOI] [PMC free article]
[PubMed] [Google Scholar] 75. Goulding K, Beaule PE, Kim PR, Fazekas A. Incidence of lateral femoral cutaneous nerve neuropraxia after anterior approach hip arthroplasty. Clin Orthop Relat Res. 2010;468(9):2397-2404. doi: 10.1007/s11999-010-1406-5. [DOI] [PMC free article] [PubMed] [Google Scholar] 76. Ataizi ZS, Ertilav K, Ercan S. Surgical
options for meralgia paresthetica: long-term outcomes in 13 cases. Br J Neurosurg. 2019;33(2):188-191. doi: 10.1080/02688697.2018.1538480. [DOI] [PubMed] [Google Scholar] 77.Ducic I, Dellon AL, Taylor NS. Decompression of the lateral femoral cutaneous nerve in the treatment of meralgia paresthetica. J Reconstr Microsurg. 2006;22(2):113-
118. doi: 10.1055/s-2006-932505. [DOI] [PubMed] [Google Scholar] 78.de Ruiter GCW, Wesstein M, Vlak MHM. Preoperative ultrasound in patients with meralgia paresthetica to detect anatomical variations in the course of the lateral femoral cutaneous nerve. World Neurosurg. 2021;149:e29-e35. doi: 10.1016/j.wneu.2021.02.100. [DOI] [PubMed]
[Google Scholar] This section collects any data citations, data availability statements, or supplementary materials included in this article. Articles from Neurosurgical Review are provided here courtesy of Nature Publishing Group Pain, burning and numbness in your outer thigh are common symptoms of meralgia paresthetica. (Photo credit:
iStock/Getty Images) Meralgia paresthetica is a condition that causes numbness, pain, or a burning feeling in your outer thigh. You might also hear it called Bernhardt-Roth syndrome. It happens when there's too much pressure on or damage to one of the nerves in your leg, specifically the lateral femoral cutaneous nerve (LFCN). This nerve is the one
giving sensation to the front and side of your thigh. In most cases, there are simple ways to treat the condition, such as wearing looser clothing. Some people with more severe meralgia paresthetica may need medication or surgery. With the right treatment and enough time to recover, you can ease your symptoms and feel better. Usually, you'll notice
the warning signs of meralgia paresthetica only on one side of your body. You might feel: Pain, tingling, numbness, or burning in the outside of your thigh Sensitivity to heatWorse pain after walking or standing for a timeYour symptoms may be mild at first, but as the condition gets worse, you
might feel sharper, shooting pain. It may go away and come back for no clear reason. Nerves travel throughout your brain about your brain about your skin, muscles, and other tissues. In meralgia paresthetica, the LFCN nerve doesn't
have enough room to pass through your hip bone or joints. This may be due to swelling, trauma, or increased pressure in this area. A lot of things can squeeze or damage the nerve, including: Weight gain and obesity Tight clothing, like pants, leggings, stockings, a belt, or a girdle Pregnancy Injury, such as trauma from a seatbelt during a car
crashSomething heavy worn around your waist, like a tool belt or gun beltA disease that can damage the nerves, like diabetesRepetitive motions that could irritate the nerve, such as certain leg movementsStanding or walking for a long time Your risk of getting the condition is higher if you: Are overweightAre pregnantHave certain medical conditions
including diabetes, hypothyroidism, and alcoholismAre between ages 30 and 60Have been exposed to lead-based paintHave legs that are different lengths Meralgia paresthetica in pregnancy meralgia paresthetica is common during pregnancy. This is because the growing baby puts pressure on your groin area, pinching the LFCN in your thigh.
Symptoms can start at any time during pregnancy or right after giving birth. These can be bother some but usually go away on their own. Doctors can diagnose the condition with a simple exam and usually don't need expensive tests. Treatment usually consists of wearing loose clothing, taking pain relievers, and avoiding standing for long
periods. Your doctor will give you a physical exam and ask about your symptoms and your medical history -- especially about any recent injuries or surgeries. The doctor will touch your leg to find the affected area. They will check for any neurological abnormalities of the lower leg. Meralgia paresthetica tests Tests to diagnose this condition
include:Imaging tests. Your doctor may order pictures of the inside of your hip and pelvic area to look for other problems that could be causing your symptoms. You may get X-rays, a CT scan, or an MRI. Electromyography. This measures the electrical activity in your muscles through a thin needle electrode. If you have meralgia paresthetica, the
results will be normal. But it can reveal another cause of your pain. Nerve conduction test. Electrode patches applied to your skin put out a small electrical impulse to see how well your nerve sends messages to the muscles. Nerve blockade. Anesthesia is injected into your thigh at the point where your LFCN is likely to be compressed. If you have
meralgia paresthetica, the pain will temporarily go away. Blood tests. Your doctor may check for signs of diabetes, hormone or vitamin imbalances, anemia or lead exposure. It can be hard to tell the difference between meralgia paresthetica and other back, hip, or groin conditions. Be patient as you work with your doctor to find the right diagnosis. The
goal of treatment is to ease the pressure on your nerve. The type of therapy you get depends on the cause of your condition. Physical therapy you may work with a physical therapy you get depends on the cause of your condition. Physical therapy you may work with a physical therapy you get depends on the cause of your condition. Physical therapy you may work with a physical therapy you get depends on the cause of your condition. Physical therapy you may work with a physical therapy you get depends on the cause of your condition. Physical therapy you may work with a physical therapy you work with a physical therapy you work with a phys
```

through your skin, or transcutaneous electrical impulses through pads applied to your skin to block pain. Medications if your condition is more severe, you may need: A corticosteroid shot to reduce swelling Tricyclic antidepressants, which can help relieve nerve pain Anti-seizure medications including gabapentin, phenytoin or pregabalin, which also work against nerve pain It can take some time for your thigh pain to go away. Some people will still feel numbness even after treatment. In most cases, though, you should be able to recover within 4 to 6 weeks. If no other treatment helps and you're in a lot of pain, your doctor may recommend surgery to ease pressure on the nerve. Lifestyle changes and home carefor mild cases, your doctor may recommend: Heat, ice, or taking over-the-counter pain relievers like acetaminophen, aspirin, ibuprofen, or naproxen for a few days Weight loss Wearing loose-fitting clothing, especially around your upper front hip Meralgia paresthetica exercises These

exercises and stretches will help you to ease meralgia paresthetica pain.Cat-cow (cat-camel).Get on your hands and knees with your hands and knees with your head and pelvis down (cat position). Do 10 times.Clamshell. Lie on your left side with your hips and feet stacked and your head resting on your left arm. Keep your stomach pulled in. Slowly raise your top (right) knee as much as possible without taking your left foot or left knee off the ground. Hold for a couple seconds and lower your right knee to the left knee. Be sure to engage your buttocks muscles while doing this. Do 10 repetitions on one side and then turn over to the other side. Lunges. This works all the leg muscles. Start by standing up will legs together and plead your left knee is parallel to the ground. Then return to your starting positions. Keep your back straight and stomach pulled in make sure your knee doesn't go beyond your toes. If you can't low you can't low you can't low you can't low your legs. How you had your legs will be supported to the ground. Then return to your starting positions. Shown as a "traveling lunge." Meralgia paresthetica sleeping positions. Don't sleep on the opposite side with a pillow between your legs. Hips and knees should be slightly bent so your hips are in alignment to ease pressure. If you sleep on your back, put a pillow or two legs. Hips and knees should be slightly bent so your hips are in alignment to ease pressure. If you sleep on your back, put a pillow or two legs. Hips and knees should be slightly bent so your hips are in alignment to ease pressure. If you sleep on your back, put a pillow or two legs. Hips and knees should be slightly bent so your hips are in alignment to ease pressure. If you sleep on your back, put a pillow or two legs. Hips and knees should be slightly bent so your hips are in alignment to ease pressure. If you sleep on your back, put a pillow or two legs are in alignment to ease pressure. If you sleep on your back, put a pillow or two legs are in alignment to ease pressure. If yo