

IATROGENIC FEMORAL NEUROPATHY MIMICKING MERALGIA PARESTHETICA FOLLOWING GROIN FLAP SURGERY: A CASE REPORT

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- Background:** Groin flap surgery carries a risk of iatrogenic nerve injury, most commonly involving the lateral femoral cutaneous nerve and presenting as meralgia paresthetica. In contrast, femoral nerve injury is rare and typically associated with motor deficits. Pure sensory femoral neuropathy is exceptionally uncommon and may closely mimic meralgia paresthetica, creating a diagnostic challenge.
- Case Report:** We report a 24-year-old man who developed severe neuropathic pain over the anterolateral thigh following groin flap donor-site closure. Initial clinical suspicion was meralgia paresthetica. However, motor examination and electrodiagnostic studies were normal. High-resolution ultrasound revealed femoral nerve displacement and edema, and ultrasound-guided transcutaneous nerve stimulation reproduced the patient's symptoms, confirming a diagnosis of pure sensory iatrogenic femoral neuropathy. The patient was successfully treated with ultrasound-guided femoral nerve hydrodissection, resulting in sustained pain relief at the 6-month follow-up visit.
- Conclusions:** Pure sensory femoral neuropathy can mimic meralgia paresthetica after groin surgery. High-resolution ultrasound is critical for accurate diagnosis, and ultrasound-guided hydrodissection may be an effective therapeutic option when conservative management fails, though further studies are needed.
- Key words:** Meralgia paresthetica; femoral nerve injury; iatrogenic femoral nerve neuropathy; transcutaneous nerve mapping

BACKGROUND

The groin flap, first described by McGregor and Jackson in 1972, remains a workhorse axial-pattern flap for reconstructing soft tissue defects of the hand (1). Its reliability, based on the superficial circumflex iliac artery, and its donor site location, which often allows for primary closure, contribute to its enduring utility (2). However, surgery in the inguinal region is not without risk, as it is a complex anatomical area traversed by several critical neurovascular structures.

Iatrogenic nerve injury is a known complication of such procedures. The lateral femoral cutaneous nerve

(LFCN), a pure sensory nerve, is particularly vulnerable as it courses variably near the anterior superior iliac spine. Injury to this nerve results in meralgia paresthetica, characterized by sensory disturbances in the anterolateral thigh (3). This condition is a well-documented, though infrequent, complication following groin flap harvest and is often the initial diagnosis for patients presenting with postoperative pain in this distribution (4).

In contrast, iatrogenic injury to the femoral nerve is a less common but potentially more debilitating event. The femoral nerve typically lies within the femoral triangle, deep to the inguinal ligament and lateral

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to the femoral artery. It provides motor innervation to the quadriceps and iliopsoas muscles and sensory supply to the anteromedial thigh and medial leg via the saphenous nerve, and to the anterior thigh via the anterior femoral cutaneous branches (5). Femoral neuropathy classically presents with motor weakness, but isolated sensory involvement can occur, posing a significant diagnostic challenge (6). A pure sensory femoral neuropathy is exceptionally rare and can mimic the clinical presentation of meralgia paresthetica due to the overlap in sensory territory on the anterior thigh, often leading to misdiagnosis and delayed appropriate management (7,8).

The advancement of high-resolution ultrasound has revolutionized the diagnosis of peripheral nerve pathologies. It allows for dynamic, real-time visualization of nerve morphology, surrounding tissue changes, and anatomical variations, making it an indispensable tool for differentiating between such neuropathies (9). Furthermore, ultrasound-guided interventions like hydrodissection—where fluid is injected to separate the nerve from adherent scar or fibrotic tissue—have emerged as effective therapeutic options for entrapment neuropathies (10).

This case report presents a patient who developed a pure sensory iatrogenic femoral nerve neuropathy following a groin flap procedure, a presentation that was initially mistaken for meralgia paresthetica. We highlight the critical role of ultrasound in achieving an accurate diagnosis, demonstrate the successful use of hydrodissection as a treatment, and discuss the potential mechanisms of femoral nerve injury during a seemingly straightforward donor site closure.

CASE REPORT

A 24-year-old, otherwise healthy man sustained a severe ring avulsion injury to his left index finger after catching his ring on a fence while climbing down. Initial examination in the emergency department revealed significant soft tissue loss with exposed distal phalanx; however, both flexor and extensor tendons were intact, and there was no fracture.

The patient was taken to the operating room and underwent reconstruction using a tubularized groin axial flap, based on the superficial circumflex iliac artery, to provide soft tissue coverage for the defect. The procedure was performed under general anesthesia without immediate noted complications. Three weeks later, the flap was successfully detached under local

anesthesia and inset to reconstruct the fingertip. The donor site in the left groin was extensively undermined to allow for primary tension-free closure.

In the days immediately following the flap detachment procedure, the patient began experiencing new-onset, severe tingling and burning pain in the anterolateral aspect of his left thigh. Due to the intensity of the pain, he was referred to the pain clinic for further assessment. On examination, he reported a neuropathic pain score of 9/10 on the Numeric Rating Scale (NRS-11). Sensory testing revealed significant mechanical hyperalgesia and allodynia over the distribution of the anterolateral thigh and extending to the anterior knee. Notably, motor examination of the left lower limb was entirely normal, with preserved strength in the quadriceps and iliopsoas muscles, and the patellar reflex was symmetrical.

Based on the classic sensory distribution, an initial diagnosis of iatrogenic LFCN neuropathy (meralgia paresthetica) was suspected. To rule out a radicular cause, magnetic resonance imaging of the lumbosacral spine was obtained, which was unremarkable. A definitive diagnosis was achieved through a targeted ultrasound examination performed in the pain clinic after obtaining informed consent. Using a high-frequency linear probe, the scan revealed a significant inferolateral displacement of the contents of the femoral triangle. Furthermore, an anatomical variation in the course of the femoral nerve was identified, with the nerve itself demonstrating a loss of normal fascicular echogenicity, consistent with post-surgical edema and irritation. To confirm the femoral nerve as the pain generator, transcutaneous nerve stimulation was performed using the Xavant StimpodNMS460 device (Xavant Technology, Pretoria, South Africa) under ultrasound guidance (out-of-plane approach). This stimulation successfully reproduced the patient's characteristic neuropathic pain along the sensory distribution of the femoral nerve. A normal electromyography (EMG)/nerve conduction studies (NCS) ruled out motor axon loss, radiculopathy, and plexopathy. When combined with the ultrasound findings (femoral nerve displacement and edema) and the reproduction of the patient's characteristic pain via ultrasound-guided transcutaneous nerve stimulation, these studies collectively supported the diagnosis of a pure sensory femoral neuropathy.

The patient was initially managed medically with gabapentin, titrated to 1,200 mg per day in 3 divided doses, but this provided no significant relief. Given the medication failure and the confirmed diagnosis, a therapeutic

ultrasound-guided femoral nerve hydrodissection was performed. The procedure involved injecting a solution of local anesthetic and corticosteroid to separate the nerve from the surrounding scar and fibrotic tissue. For each hydrodissection, the injectate consisted of: 0.25% bupivacaine (5 mL), 40 mg/mL methylprednisolone acetate (1 mL), and 0.9% normal saline (4 mL), for a total volume of 10 mL per procedure. The patient experienced immediate and significant pain relief, with the NRS-11 score dropping to 6/10 within one hour post-procedure. The pain continued to improve, reaching 4/10 at one week and 3/10 at 2 weeks. As the pain worsened to 4/10 by the third week, a second hydrodissection procedure was performed at the 4-week mark. This repeated intervention resulted in sustained improvement, with the NRS-11 score improving to 3/10 at the 4-week follow-up and further to 2/10 at the 6-week follow-up, demonstrating a successful and favorable response to the intervention.

DISCUSSION

This case illustrates a rare and diagnostically challenging complication of a common reconstructive procedure: a pure sensory iatrogenic femoral neuropathy following a groin flap, which mimicked the more common meralgia paresthetica. Our case report focuses on the anatomical basis for the injury, pivotal role of modern diagnostics, and emerging therapeutic approach that led to a favorable outcome.

Groin flap is a time-tested and reliable option for hand reconstruction, with most literature focusing on flap survival and donor-site morbidity such as seroma, hematoma, or hypertrophic scarring (1,2). Neurological complications are typically associated with the LFCN. The incidence of meralgia paresthetica after groin flap surgery has been reported to be as high as 10%, a fact well-documented in several case series (4,11). Our case was initially managed under this common presumption. However, the failure of first-line neuropathic pain medication and the specific findings on ultrasound prompted a deeper investigation, leading to the correct, albeit rarer, diagnosis.

The femoral nerve is generally considered less vulnerable during groin flap harvest than the LFCN due to its deeper location within the femoral triangle. Reported cases of femoral nerve injury are scarce and almost universally involve a mixed sensorimotor deficit, often resulting from direct trauma, excessive traction, or hematoma formation (12,13). The presentation of an isolated sensory neuropathy, as seen in our patient, is exception-

ally unusual. We postulate 2 primary mechanisms for this injury. First, the extensive undermining required for primary donor-site closure likely caused significant inferolateral traction on the soft tissues of the femoral triangle, leading to a stretch neuropraxia of the femoral nerve. This is supported by the ultrasound findings of an inferolaterally displaced femoral triangle with loss of the nerve's normal echogenicity, indicating edema and microtrauma. Second, the patient was found to have an anatomical variation in the course of the femoral nerve, potentially placing it in a more superficial or lateral position than usual, thereby increasing its susceptibility to iatrogenic injury during closure. Such anatomical variations are not uncommon and have been implicated in unexpected nerve injuries during routine procedures as reported by Benglis et al (14).

This case underscores the limitations of relying solely on clinical presentation and standard electrodiagnostics. While EMG/NCS is the gold standard for confirming motor axon loss, it can be entirely normal in pure sensory or mild neuropraxic injuries according to Dillingham (15), as it was in our patient. This is where high-resolution ultrasound has revolutionized peripheral nerve diagnosis. As demonstrated, ultrasound provided dynamic, real-time evidence of the nerve's altered anatomy and echotexture, effectively ruling out a simple LFCN compression. Furthermore, the use of transcutaneous nerve stimulation under ultrasound guidance to provocatively confirm the femoral nerve as the pain generator represents a promising diagnostic application of this technology, warranting further investigation in post-surgical pain settings (16).

The successful management of this patient with ultrasound-guided hydrodissection aligns with a growing body of evidence by Cass and Lam supporting this minimally invasive technique for entrapment neuropathies (9,17). The initial failure of gabapentin highlights that pharmacologic management alone is often insufficient for neuropathies with a significant mechanical or compressive component. Hydrodissection is thought to work by mechanically freeing the nerve from surrounding fibrotic adhesions, improving gliding, and delivering a high concentration of corticosteroid directly to the site of irritation to reduce inflammation (18).

The significant and sustained pain reduction after 2 procedures in our patient provides clinical support for this mechanism and suggests that hydrodissection is a viable therapeutic option for post-surgical neuropathies where scarring and tethering are suspected.

Limitations

A limitation of this report is the inability to obtain a preoperative ultrasound, which would have definitively confirmed the anatomical variation. However, the clear postoperative changes, combined with the clinical and diagnostic findings, provide a compelling argument for the diagnosis.

CONCLUSIONS

In conclusion, this case serves as a critical reminder that not all anterolateral thigh pain after groin surgery

is meralgia paresthetica. Surgeons and pain physicians should maintain a high index of suspicion for iatrogenic femoral nerve injury, particularly in cases of atypical presentation or poor response to initial therapy. The combination of a detailed physical exam, a normal EMG, and targeted high-resolution ultrasound is essential for an accurate diagnosis. Finally, ultrasound-guided hydrodissection presents a promising and effective intervention for managing such challenging post-surgical nerve injuries, offering significant relief when conventional medications fail.

REFERENCES

1. McGregor IA, Jackson IT. The groin flap. *Br J Plast Surg* 1972; 25:3-16.
2. Chuang DC, Jeng SF, Chen HT, Chen HC, Wei FC. Experience of 73 free groin flaps. *Br J Plast Surg* 1992; 45:81-85.
3. Cheatham SW, Kolber MJ, Salamh PA. Meralgia paresthetica: A review of the literature. *Int J Sports Phys Ther* 2013; 8:883-893.
4. Ahmadi I, Herle P, Rozen WM, Leong J. Meralgia paresthetica following groin flap harvest: Case report and review of the literature. *Eplasty* 2015; 15:ic30.
5. Standring S. *Gray's Anatomy: The anatomical basis of clinical practice*. 41st ed. Elsevier, Philadelphia, PA, 2016.
6. Kim DH, Murovic JA, Tiel RL, Kline DG. Intrapelvic and thigh-level femoral nerve lesions: Management and outcomes in 119 surgically treated cases. *J Neurosurg* 2004; 100:989-996.
7. Gibelli F, Ricci G, Sirignano A, Bailo P, De Leo D. Iatrogenic femoral nerve injuries: Analysis of medico-legal issues through a scoping review approach. *Ann Med Surg (Lond)* 2021; 72:103055.
8. Dureja GP, Gulaya V, Jayalakshmi TS, Mandal P. Management of meralgia paresthetica: A multimodality regimen. *Anesth Analg* 1995; 80:1060-1061.
9. Tagliafico A, Altafini L, Garelli I, Marchetti A, Gennaro S, Martinoli C. Traumatic neuropathies: Spectrum of imaging findings and postoperative assessment. *Semin Musculoskelet Radiol* 2010; 14:512-522.
10. Cass SP. Ultrasound-guided nerve hydrodissection: What is it? A review of the literature. *Curr Sports Med Rep* 2016; 15:20-22.
11. Nahabedian MY, Dellon AL. Meralgia paresthetica: Etiology, diagnosis, and outcome of surgical decompression. *Ann Plast Surg* 1995; 35:590-594.
12. Katsaros J, Tan E. Femoral nerve palsy: An unusual complication of groin dissection. *Aust N Z J Surg* 1980; 50:566-567.
13. Kumar A, Dalela D, Bhandari M, et al. Femoral neuropathy: An unusual complication of renal transplantation. *Transplantation* 1991; 51:1305-1306.
14. Benglis DM, Vanni S, Levi AD. An anatomical study of the lumbosacral plexus as related to the minimally invasive transpsoas approach to the lumbar spine. *J Neurosurg Spine* 2009; 10:139-144.
15. Dillingham TR. Electrodiagnostic approach to patients with suspected radiculopathy. *Phys Med Rehabil Clin N Am* 2002; 13:567-588.
16. Hasnain I, Usmani H, Hasan M, Ali T. The impact of using transcutaneous nerve mapping as an adjunct to ultrasonography for lateral femoral cutaneous nerve block amongst post graduate trainees: A randomized control study. *Minerva Anesthesiol* 2025; 91:650-657.
17. Lam KHS, Hung CY, Chiang YP, et al. Ultrasound-guided nerve hydrodissection for pain management: Rationale, methods, current literature, and theoretical mechanisms. *J Pain Res* 2020; 13:1957-1968.
18. Wu YT, Ho TY, Chou YC, et al. Six-month efficacy of perineural dextrose for carpal tunnel syndrome: A prospective, randomized, double-blind, controlled trial. *Mayo Clin Proc* 2017; 92:1179-1189.