

Retroperitoneal hematoma presenting as acute meralgia paresthetica: Case report, review of literature and cadaveric demonstration

Jibanananda Satpathy, Varatharaj Mounasamy, Gregory Golladay, James Phillip Reynolds

ABSTRACT

Introduction: Spontaneous retroperitoneal hematoma is a relatively rare condition that usually occurs in patients receiving anticoagulation therapy or those with a history of hemophilia. The presentation may vary from mild abdominal discomfort to acute hemodynamic collapse. Given the potential for exsanguination, it is important to detect this potentially life-threatening condition early for appropriate management. **Case Report:** In this report, we discuss an uncommon presentation of a retroperitoneal hematoma in which the patient initially sought treatment for thigh and ankle pain related to a recent minor trauma. During the course of her evaluation over several days, a diagnosis of acute meralgia paresthetica was entertained and treated with relief of her symptoms. However, an evolving retroperitoneal hematoma was subsequently identified as the cause of her condition. **Conclusion:** Physicians should be aware of this seemingly benign presentation of a life-threatening retroperitoneal

hematoma to avoid delays in diagnosis and treatment as described in this report.

Keywords: Iliopsoas hematoma, Meralgia Paresthetica, Retroperitoneal

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INTRODUCTION

Spontaneous retroperitoneal hematoma is a relatively rare complication mostly associated with anticoagulation therapy [1–7]. Femoral nerve compression associated with an iliopsoas or retroperitoneal hematoma is widely reported in literature [1–3, 6, 7]. A combination of femoral neuropathy and meralgia paresthetica has been described in literature as a result of a traumatic iliacus hematoma [8]. However, isolated symptoms of acute lateral femoral cutaneous nerve compression are rare and frequently dismissed due to benign causes in the otherwise healthy and ambulatory patient. This case demonstrates an unusual presentation of a potentially life threatening condition. Upon review of literature, and to our knowledge, these circumstances have not been

previously reported. The seemingly benign nature of this patient's initial symptoms created a diagnostic dilemma and led to a delay of diagnosis and management. This case is presented to alert health care professionals of potential underlying, life-threatening pathology when considering a diagnosis of meralgia paresthetica and soft tissue injury.

CASE REPORT

A 56-year-old woman presented to the emergency department with acute, anterior-lateral thigh pain following an injury to the left ankle three days prior. She reported a history of acute hyper-flexion of left ankle while trying to get up from a chair. She was able to bear weight with minimal pain in the ankle. Her ankle injury was considered a sprain, and her thigh symptoms were addressed with a non-specific diagnosis of "soft tissue injury". Two days later, she returned to the emergency room with increasing pain in the left anterior-lateral thigh and mild pain in left ankle. She was assessed clinically. No imaging studies were obtained. Again, a diagnosis of soft tissue injury was made, and she was discharged home with analgesia.

Twelve hours later, the patient returned to emergency department with escalating thigh and groin pain. She was unable to bear weight. Additionally, she was unable to fully extend the left hip due to her discomfort. She had a characteristic flexion and external rotation attitude. Radiographs of the hip and knee did not reveal any bony injury. On examination, the pain distribution corresponded to that of the lateral femoral cutaneous nerve of left thigh. She had a sensory deficit in the distribution of lateral femoral cutaneous nerve as well. Sensation in the remainder of the limb was otherwise normal. Distal pulses were normal. She also had quadriceps power of only four out of five on standard scales, which was attributed to pain. An orthopaedic surgery consult was requested with confirmation of the examination outlined above. Concurrently, given her history, a diagnosis of acute meralgia paresthetica was entertained and confirmed with a local block to the lateral femoral cutaneous nerve with dramatic relief of her thigh pain and improvement in motor function.

The patient's vital signs remained stable with a normal blood pressure but sinus tachycardia. In the course of her orthopedic evaluation, her medical history was reviewed and found to be remarkable for a previous mitral valve replacement and chronic anticoagulation with warfarin. In the next hour, as her thigh pain abated from the local block, she recognized left lower quadrant abdominal and flank pain, which was not previously recognized. She was found to be tender to palpation in these regions as well. Radiographs of the abdomen demonstrated a widened psoas shadow on the left side (Figure 1). Concurrently, laboratory results revealed an elevated INR of 14.2. A provisional diagnosis of retroperitoneal hematoma was

made. An urgent computed tomography scan confirmed an expanding hematoma involving the left iliopsoas muscle (Figures 2 and 3).

The patient was treated with vitamin K and fresh frozen plasma to reverse her coagulopathy and was resuscitated with blood transfusions. Her anticoagulation status was monitored, and the hematoma was followed by serial computed tomography scans. No surgical interventions were required. She made a complete recovery with non-operative management. At her last follow-up, she was ambulatory and had no residual neurologic deficits.

Anatomical Considerations

We performed a cadaveric study to determine whether isolated swelling of iliacus or psoas muscle or a combination of both will produce stretching of the lateral femoral cutaneous nerve. A fresh cadaver was dissected. The lateral femoral cutaneous nerve was exposed. Care was taken to protect the iliopsoas fascia while dissecting the nerve. Once the nerve was dissected out, this was marked at two specific points along its course using black marker as shown in Figure 4.

As we injected fluid into the iliacus muscle, it started expanding and the nerve appeared to be visibly stretched. However, once we injected 150/ml of volume, the iliacus compartment stopped expanding and fluid began to back track from the injection site suggesting to us that the compartment had reached its maximum pressure and would no longer expand under our experimental conditions (Figure 5).

We repeated the dissection on the contralateral side and injected fluid into the psoas muscle. The psoas compartment immediately expanded, however, after achieving a certain dimension the muscle stopped expanding with additional fluid. We were able to inject a large volume of fluid under low pressure to the psoas muscle without any further expansion. Visually, this fluid volume did not seem to have any effect on the lateral femoral cutaneous nerve. In the same side, we injected into the iliacus muscle and results were similar to our previous experiment on the iliacus muscle in the contralateral side.

Our experiment suggested that an iliopsoas hematoma would stretch the lateral cutaneous nerve. Under our experimental conditions we were unable to over expand the iliacus muscle as fluid back tracked from the needle injection track. However, in vivo, it is likely that the tissue will expand further which would explain severe lateral femoral cutaneous paraesthesia symptoms.

DISCUSSION

The lateral femoral cutaneous nerve of thigh is a branch of lumbar plexus. It arises from the dorsal divisions of the second and third lumbar nerves. It emerges from the lateral border of the psoas major mid-



Figure 1: Anteroposterior abdomen X-ray showing enlarged left psoas shadow.

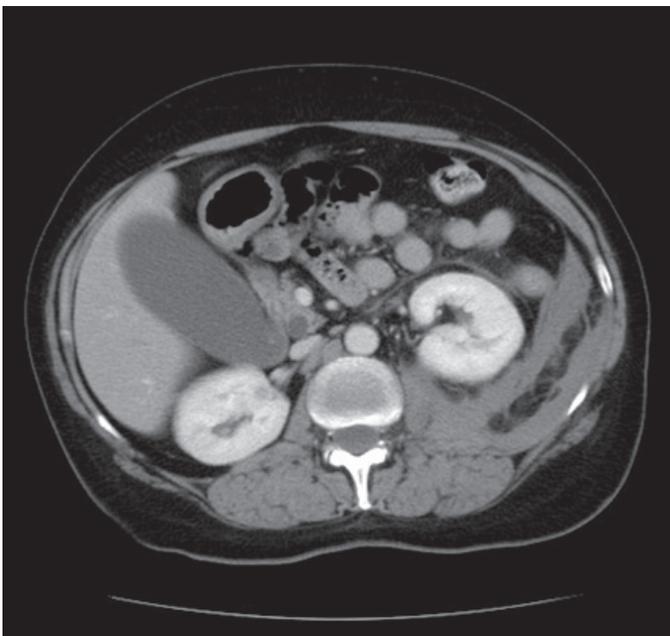


Figure 2: Computed tomography scan showing enlarged left psoas muscle with displaced left kidney.

substance and crosses the iliacus muscle over its sheath obliquely towards the anterior superior iliac spine. It then passes under the inguinal ligament and over the sartorius muscle into the thigh where it divides into anterior and posterior branches. The nerve is most vulnerable to

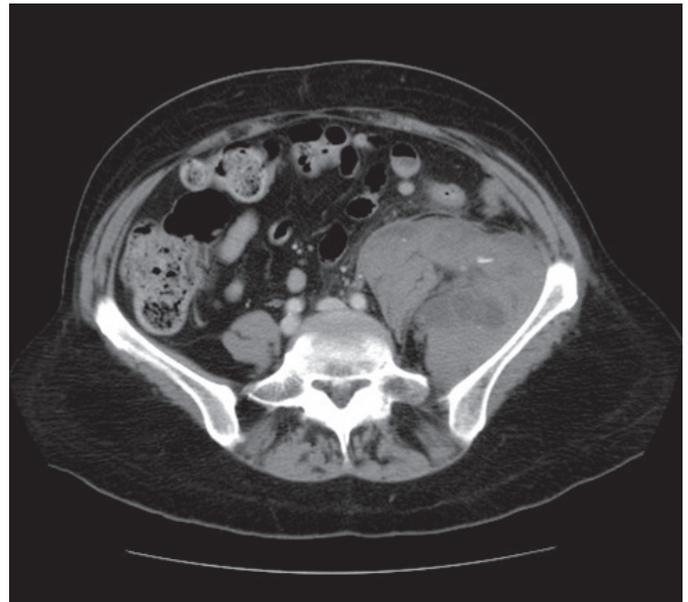


Figure 3: Computed tomography scan showing enlarged left iliacus and psoas muscle with evidence of active bleeding.

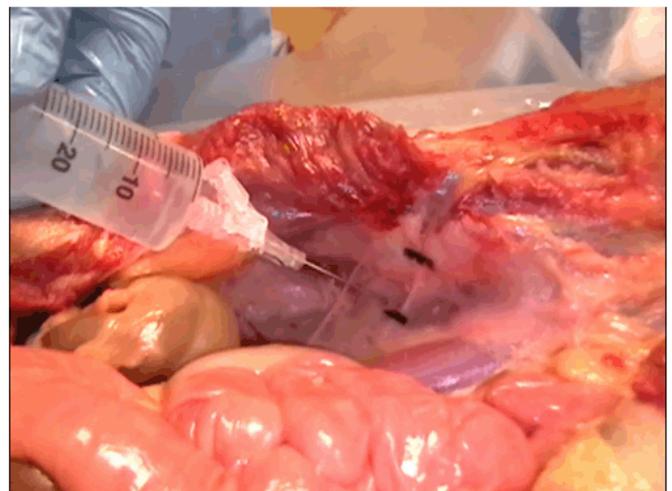


Figure 4: Exposed lateral femoral cutaneous nerve and injection of fluid into iliacus muscle.

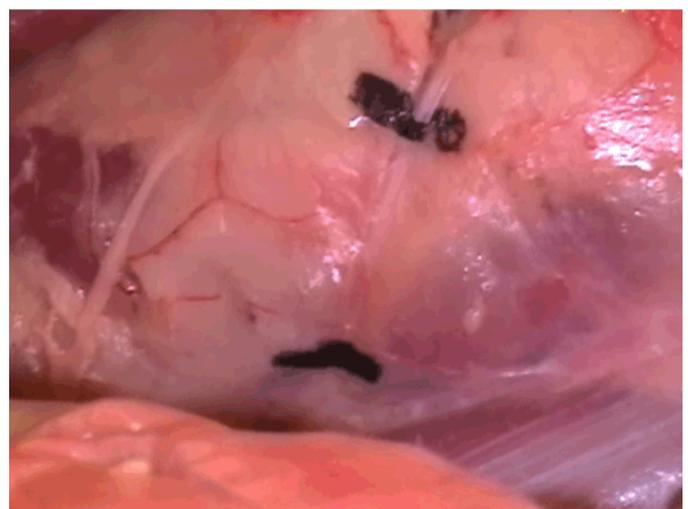


Figure 5: Visible distention of iliacus muscle and lateral femoral cutaneous nerve following injection of 150 cc of fluid.

compression as it emerges from beneath the inguinal ligament but anterior to the iliopsoas muscle [9]. It then passes around the anterior superior iliac spine, courses through the fibrous canal of the fascia lata, and finally exits the fascia lata several centimeters distally into the subcutaneous thigh. Considering the anatomic course of the lateral femoral cutaneous nerve in relation to the iliopsoas muscle, one would expect an iliopsoas hematoma to produce lateral cutaneous femoral nerve compression. However, in these cases, isolated meralgia paresthetica is a rare manifestation as opposed to overt femoral nerve compression as previously reported [1–3, 6, 7].

The described case is unusual because the initial presenting symptoms were largely sensory and localized to the distribution of the lateral femoral cutaneous nerve. It is clear from the experimental study of Goodfellow et al. that isolated psoas hematoma is unlikely to give rise to nerve compression symptoms [6]. They demonstrated that psoas fascia is thin and distensible and can contain large amount of fluid at a low pressure. They further demonstrated that the iliac fascia is also thin except at the lower portions where it blends with psoas sheath. The iliacus compartment can contain very small volume and starts distending at the thinner fascial layer first and subsequently expands up the psoas compartment as more volume is accumulated [6, 10]. It is at this point the hematoma starts compressing the femoral nerve in the sheath. It is clear from the CT scan shown in this article that both iliacus and psoas muscles are grossly enlarged. We think that both the muscles were primarily injured and that bleeding occurred directly into both sheaths rather than an iliacus hematoma expanding into the psoas. Relatively early intervention could have prevented a compression of femoral nerve in our case.

We are aware of variations in the course of lateral femoral cutaneous nerve and presume that one of the anatomic variations in its course might have predisposed the nerve to be stretched during this patient's previously described "stumbling" injury [9, 11]. However, due to the acute nature of this process, our patient did not undergo electromyographic studies to delineate the specifics of her neurologic condition. She responded favorably to a local block of the lateral femoral cutaneous nerve with an associated improvement in quadriceps motor function. Given the dramatic response to the local injection and improved muscular function, previously noted motor deficits were attributed to pain.

The majority of reports in literature recommend non-operative treatment of this condition with aggressive reversal of anticoagulation therapy leading to good results [12–15]. This includes withdrawal of anticoagulation therapy, correction of coagulopathy, intravenous fluid resuscitation and supportive measures [15]. Merrick et al. showed success in ultrasound-guided aspiration in similar conditions. They concluded that aspiration of even a small volume of the hematoma yields good symptomatic relief and minimizes compression of the associated nerves [16].

Lastly, the concept that a spontaneous retroperitoneal hematoma develops as the result of diffuse microvascular bleeding has been recently challenged by successful treatment with selective arterial embolization [17, 18]. Parmer et al. in a report of four cases concluded that even in the event of non-progressive neurologic deterioration without active bleeding, surgical decompression yields good long-term results with minimal neurologic deficit [19].

Non-operative treatment was successful in our patient despite the delay of diagnosis over several days. In our opinion, conservative management is a reasonable option in cases where the patient remains hemodynamically stable. Serial computed tomography scans are recommended to confirm resolution of the hematoma.

Lastly, it is important to note that this patient's underlying condition was only unveiled after a thorough review of the medical history. This led to laboratory testing of her anticoagulation status. Concurrently, the lateral femoral cutaneous nerve block assisted in unmasking her flank and abdominal pain, which prompted the diagnostic studies that led to her diagnosis. This report is submitted in an effort to emphasize the importance of a thorough history and physical examination and also to show an unusual presentation of retroperitoneal hematoma when evaluating minor musculoskeletal trauma.

CONCLUSION

An iliopsoas, retroperitoneal hematoma is a potentially life-threatening condition which most commonly occurs in patients with a bleeding diathesis or those receiving anticoagulation therapy. Early detection is paramount to prevent exsanguination. This case is an unusual presentation as the patient's initial symptoms were isolated to thigh and ankle pain subsequent to stumbling while getting out of a chair. This led to a delay in diagnosis of the underlying, life-threatening condition. As demonstrated in this case, a thorough history should be performed on all patients presenting with minor musculoskeletal trauma.

Author Contributions

Jibanananda Satpathy – Substantial contributions to conception and design, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Mounasamy, Varatharaj – Substantial contributions to conception and design, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Gregory Golladay – Substantial contributions to conception and design, Analysis and interpretation

of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

James Reynolds – Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

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