

# A Case of Femoral Neuropathy Secondary to Iliopsoas Hematoma Due to Warfarin Intoxication

## Warfarin İntoksikasyonuna Bağlı İliopsoas Hematomuna Sekonder Femoral Nöropati Olgusu

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### ABSTRACT

Warfarin is a widely used drug in patients with a high risk of thromboembolism in cardiovascular diseases. Serious complications can be encountered as a result of high side effect profile and narrow therapeutic window. Iliopsoas hematoma and secondary femoral neuropathy are among the complications that may be encountered. The patient was admitted to the hematology clinic because of warfarin intoxication. Paresis was observed in the right lower extremity during follow-up. Iliopsoas hematoma was detected in the imaging study and electrophysiological study revealed femoral nerve neuropathy. After the diagnosis, conservative treatment and rehabilitation program was initiated immediately. In this article, a case of femoral nerve neuropathy following iliopsoas hematoma due to warfarin intoxication was presented.

**Keywords:** Femoral neuropathy, hematoma, intoxication, warfarin

### ÖZ

Warfarin, kardiyovasküler hastalıklarda tromboemboli riski yüksek olan gruplarda yaygın olarak kullanılan bir ilaçtır. Yan etki profilinin yüksek olması ve terapötik pencerenin darlığı sonucu ciddi komplikasyonlarla karşılaşabilmektedir. İliopsoas hematomu ve buna sekonder femoral nöropati karşılaşılabilecek komplikasyonlardan biridir.

Hasta warfarin intoksikasyonu nedeni ile hematoloji servisine yatırılmış, izlemi esnasında sağ alt ekstremitede kas gücü kaybı gelişmiştir. Hastanın görüntüleme çalışmasında iliopsoas hematomu görülmüştür. Elektrofizyolojik çalışmada ise femoral sinir nöropatisi saptanmıştır. Hastaya tanı konduktan sonra ivedilikle konservatif tedavi ve rehabilitasyon programı başlanmıştır. Bu yazıda warfarin intoksikasyonu nedeniyle gelişen iliopsoas hematomu sonrası oluşan femoral sinir nöropatisi olgusu takdim edilmiştir.

**Anahtar Kelimeler:** Femoral nöropati, hematom, intoksikasyon, warfarin

### Introduction

Femoral neuropathy, which is one of the lower extremity neuropathies, is not a common condition and is mostly due to diabetic amyotrophy. Femoral nerve neuropathies are not common because the femoral nerve is located in the pelvis and in the anterior part of the thigh. Hip and pelvic fractures, compression due to mass lesions, birth complications, abdominal and pelvic lymphedema, blunt trauma, femoral artery interventions such as coronary angiography, hip replacement surgery, abdominal and pelvic surgery, femoral lymph node biopsy can be the cause of femoral nerve neuropathy (1,2). Prolonged lithotomy position may also be a cause of femoral neuropathy (2). Bleeding disorders or anticoagulant therapies can also cause retroperitoneal hematoma and may cause compression on the femoral nerve (3,4). Retroperitoneal hemorrhages and hematomas that cause compression on the femoral

nerve can cause a wide range of symptoms, from mild inguinal pain to death. Therefore, early diagnosis and treatment are important in reducing morbidity and mortality (5,6). Femoral neuropathy caused by iliac hematoma is characterized by reduced muscle strength in knee extensors and hip flexors, and diminished patellar reflex (5). Hypoesthesia in the anteromedial aspect of the thigh is generally detected on the sensory examination (5). In this article, a case with iliopsoas hematoma and secondary femoral neuropathy following warfarin intoxication, and who was enrolled to a rehabilitation program will be discussed in the light of the literature.

### Case Report

An 87-year-old male patient was admitted to the general surgery clinic with a complaint of right-sided inguinal pain and bruising of the back and legs for 10 days. He was transferred to the hematology clinic with



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a preliminary diagnosis of warfarin intoxication. He had previously undergone aortic valve replacement and surgery for bladder cancer, and was diagnosed with chronic renal failure. He was taking warfarin irregularly. In laboratory tests, international normalized ratio (INR) was 4.5 and hemoglobin was 9.2. His warfarin treatment was stopped. The patient was started on 2x0.6 cc enoxaparin. Due to the presence of pain in the inguinal region and signs of femoral nerve injury, he was consulted to physical medicine and rehabilitation (PMR) clinic and magnetic resonance imaging (MRI) was performed with a prediagnosis of iliopsoas hematoma. The MRI result was reported as “approximately 78x65x114 mm mass lesion suggestive of hematoma in the right iliacus muscle area, centrally hypointense and peripherally hyperintense on T1-weighted images (T1-WI), having heterogeneous intensity on T2-WI, restricted diffusion on diffusion-WI, no prominent contrast enhancement on post-contrast images” (Figures). The patient was consulted with the general surgery clinic. Surgical intervention was not considered because the hematoma was only in the muscular plane, there was no history of trauma and the patient’s general condition was good. He was followed-up with medical treatment. Vitamin K and fresh



Figure 1. Hematoma on T2-weighted images sequence in coronal plane

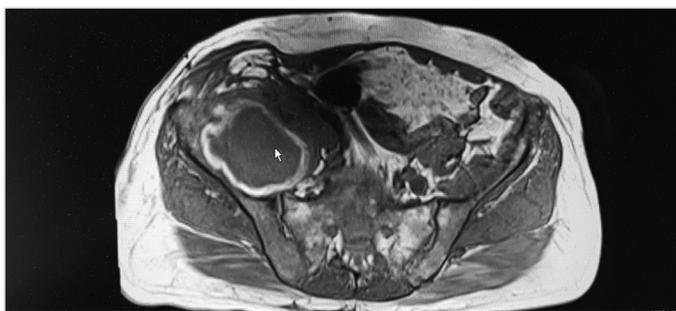


Figure 2. Hematoma on T1-weighted images sequence in axial plane

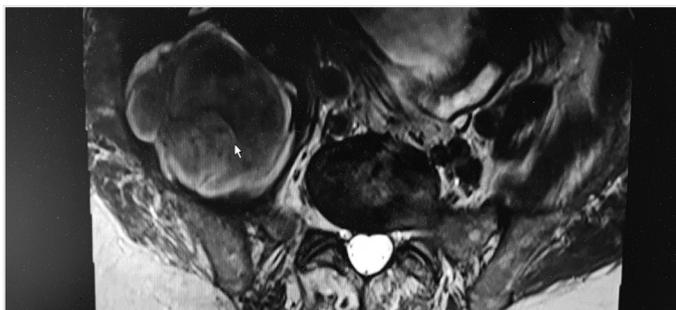


Figure 3. Hematoma on T2-weighted images sequence in axial plane

frozen plasma were administered for hemorrhage. He was consulted again to PMR clinic for diagnosis and rehabilitation program. On his physical examination, hip movements were painful, hip flexor muscle strength was 2/5, hip abductor muscle strength was 2/5 and muscle strength of knee extensors was 2/5. The patellar reflex was hypoactive. Electromyography (EMG) was requested with a preliminary diagnosis of femoral nerve neuropathy. Femoral nerve neuropathy was detected in EMG. Isometric-isotonic strengthening exercises for hip flexors and knee flexors were started 3x20 times a day, for a total of 20 sessions during the patient’s hospital stay. Following muscle strength increase tracking, rehabilitation program including progressive resistance strengthening exercises and balance training was initiated. The patient was consulted to the algology clinic because of pain, and tramadol and pregabalin treatment was started. In the follow-up, femoral nerve examination revealed clinical improvement with medical treatment and exercise. On his physical examination, hip movements were minimally painful, hip flexor muscle strength was 4/5, hip abductor muscle strength was 4/5 and muscle strength of knee extensors was 4/5. Patellar reflex was evaluated as normoactive. The patient’s initial visual analogue scale score was 8 and decreased to 3 in the post-treatment period. The patient was discharged with 2x0.6 cc enoxaparin treatment and home exercise program recommendations. In the control examination, after the resolution of psoas hematoma in imaging and improvement in his complaints, warfarin treatment was initiated with the recommendations of the hematology and cardiology clinics.

Written and oral informed consents were obtained from the patient and presented.

## Discussion

Femoral nerve is a mixed motor and sensory nerve, which is the largest branch of lumbar plexus. It originates from L2, L3, and L4 nerves and lies anterior to the psoas muscle. This level is at the upper margin of L5 vertebra. The nerve runs from here through the iliac and psoas muscles until it passes under the inguinal ligament. It passes under the inguinal ligament with the femoral artery and vein, and is divided into motor and sensory branches. The motor branch of the femoral nerve innervates the iliopsoas muscle, the pectineus muscle, the quadriceps femoris and the sartorius. The sensory branch innervates the medial part of the thigh and the medial part of the leg (1).

Hemorrhagic complications in anticoagulant therapy are potential complications. The most dangerous complications are seen in the intracranial and retroperitoneal regions. The risk of hemorrhage is directly proportional to the INR level. Major hemorrhagic complications increase significantly when INR is more than 3. The INR value was 4.5 in our patient and he was in the high-risk group for hemorrhagic complications.

Retroperitoneal hemorrhages mostly present with anemia, back pain, thigh pain, paresthetic complaints or shock due to massive bleeding. In the cases, the femoral nerve is most likely to be compressed and the associated symptoms occur (3).

Iliopsoas hematoma is a rare disease and is associated with high mortality. Although mortal, most of the cases are expected to recover within the first year. Although hemorrhage due to warfarin intoxication is usually seen in the early years of drug initiation, iliacus muscle

hematoma developed after long-term use of warfarin in our case.

Iliopsoas hematoma usually manifests with sudden onset of inguinal, hip, thigh or low back pain. In the differential diagnosis, ureteric stones, aortic dissection, hip pathologies, and radiculopathies originating from lumbar region should be considered first (3). The femoral nerve can be compressed everywhere during the course of the nerve, but the region where the femoral nerve is most vulnerable to injury is in the iliacus muscle compartment. Most of the femoral nerve neuropathies develop due to hematomas or rupture of iliacus or iliopsoas muscles resulting from traumas in the iliopsoas compartment. Femoral neuropathy caused by iliacus hematoma is characterized by reduced muscle strength in knee extensors and hip flexors, and diminished or absent patellar reflex. Hip flexion is affected in proximal level lesions, while hip flexion is preserved in lesions at the level of inguinal ligament and the problem is more related to knee extension. On the sensory examination, the sensation on the inner face of the leg and thigh is generally lost or decreased (6). Also, the leg cannot be held straight and the patient may fall due to knee flexion while walking.

The most commonly used imaging methods for the diagnosis of iliopsoas hematoma are ultrasonography (USG), MRI and computed tomography (CT). While USG is in the second place due to its inability to show deep tissues effectively, MRI should be considered in the first place with its ability to show retroperitoneal hemorrhage and provide effective differential diagnosis. CT can be effective in determining the localization of the hemorrhage in the acute period and in patients in whom MRI cannot be performed (6). In the follow-up of retroperitoneal hemorrhage and hematomas, MRI is one step ahead. EMG is a useful technique for the diagnosis of femoral neuropathy and the exclusion of other nerve pathologies. In addition, the severity of femoral nerve involvement and regeneration in the recovery period can also be determined by EMG. Bilateral femoral nerve motor and saphenous nerve sensory measurements are performed. Impulses are repeated above and below the inguinal ligament. Because of the clinical improvement in our patient, no control EMG was required.

Although the femoral nerve is large in size, it is difficult to detect femoral nerve in MRI. While it can be detected on coronal images in the inguinal region, it is difficult to detect it in the thigh region due to its small size. Intrapelvic femoral nerve injury should be considered when signal changes compatible with denervation are detected in the iliopsoas muscle (6).

The treatment can be conservative, transarterial embolization or surgery. Surgical decompression should be considered in trauma patients and in patients with large hematomas and neurological progression. Surgical decompression in the early period may accelerate recovery. The patients may not benefit from surgery if the surgery is delayed in patients with increased hematoma volume or progressive neurological deterioration. Conservative treatment approach should be considered in patients with coagulation disorder and prolonged coagulation due to drugs (7). In conservative treatment, bed rest is recommended and analgesic is given to the patient. Open surgery or percutaneous surgical techniques can be used. In one study, it was shown that paralysis persisted with conservative treatment where recovery was faster with surgery (4). However, there was no significant difference in prognosis between conservative and surgical treatment in some studies (8). In a review, it was reported that

the complications of surgical treatment in femoral nerve neuropathy could lead to very serious consequences and that conservative methods should be tried firstly in treatment (9). Recently, successful cases have been reported by percutaneous transcatheter arterial embolization of the responsible artery (10). Patients should be included in the rehabilitation program, regardless of the treatment approach. Patients should start electrotherapy and exercise program in the rehabilitation program (5). EMG biofeedback and electrical stimulation can also be used in rehabilitation programs.

## Conclusion

In patients with femoral neuropathy findings and bleeding diathesis or anticoagulant use, iliopsoas muscle hematoma should be considered in all cases. After being treated conservatively or surgically, patients should be included in the rehabilitation program. Regardless of the etiology and treatment, all patients should be included in the early rehabilitation program to maintain muscle mass and patient functionality.

**Informed Consent:** Written and oral informed consents were obtained from the patient and presented.

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