Clinical Impact of Imaging Iliopsoas Hematomas during Anticoagulation

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The respective accuracy of ultrasound and computed tomography in the establishment of the diagnosis of iliopsoas hematomas is assessed in 31 patients receiving anticoagulant therapy presenting with a femoral neuropathy. Clinical, radiologic, and surgical findings were reviewed retrospectively in 31 cases of retroperitoneal hematomas, including 16 psoas, 12 iliacus, and 3 iliopsoas muscle hematomas. Because the retroperitoneal muscles often are poorly displayed by abdominal sonography, computed tomography rather than ultrasound should be performed in all cases of suspected iliopsoas hematoma. Computed tomography can confirm the diagnosis and precisely define the location and the size of the hematoma.

Ifemoral neuropathy due to a compressive hematoma in the iliopsoas compartment is a rare complication of bleeding disorders. This condition is reported primarily in patients suffering from hemophilia (1, 2) and less commonly in patients receiving heparin or oral anticoagulant therapies (3, 4).

The purpose of this retrospective study is to assess the diagnostic accuracy of ultrasound (US) and computed tomography (CT), to determine which muscle of the iliopsoas compartment is involved by the hematoma, and to define the best therapeutic management of the femoral neuropathy. Clinical features, 28 sonograms, 17 CT examinations, and 13 operative reports were reviewed in 31 patients with iliopsoas hematoma as a complication of anticoagulant therapy. To our knowledge, our series is the largest reported on this topic.

PATIENTS AND METHODS

Over a 12-year period, a spontaneous hematoma of the iliopsoas compartment causing femoral neuropathy was diagnosed in 31 patients receiving anticoagulant therapy. The patients included 17 men (55%) and 14 women (45%). The age range was 39–87 years (mean, 64 years; standard deviation, 13 years).

Of the 31 patients, 18 (58%) received intravenous heparin, 11 (36%) coumarinic derivatives, and 2 (6%) subcutaneous heparin. At admission, nine patients (29%) were overanticoagulated, with an international normalized ratio of more than 4.8 or an activated partial thromboplastin time over 65 seconds. The duration of the anticoagulant therapy ranged from 1 day to 32 years.

Twenty-six patients (84%) complained of abdominal, groin, hip, or thigh pain, inducing lameness in six patients. Clinically, a sensory deficit in the femoral territory was present in 15 patients (49%) and a motor deficit of the quadriceps and/or iliopsoas muscles in 13 patients (42%). Hypovolemic shock was present in 10 cases (32%).

All patients underwent emergency sonographic and/or CT examinations. Twenty-eight patients (90%) had abdominal sonographic examinations. Seventeen (55%) abdominal CT examinations were obtained with 8- or 10-mm sections after oral and rectal contrast administration. Intravenous bolus injection of 40 ml followed by a drip infusion of 60 ml of iodinated contrast material were administered in nine patients (55%). Eight patients (45%) did not receive an intravenous iodinated contrast injection because of their critical clinical condition.

Key Words

Anticoagulants; Psoas muscles; Retroperitoneal space

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Surgical drainage of the hematoma was performed in 13 patients (42%). During surgery, the precise location of the hematoma and the involved muscles were recorded in each report.

CT and sonographic examinations were separately reviewed to determine the size, location, and pattern of the hematoma of the iliopsoas compartment. Radiologic observations were correlated with surgical reports in the 13 operated patients, and with laboratory tests, radiologic follow-up, and clinical course in the 18 patients who were treated nonoperatively.

RESULTS

Clinical examinations, imaging, and surgical findings led to the final diagnosis of 16 psoas, 12 iliacus, and 3 iliopsoas muscle hematomas. Radiologic examinations performed and treatment given for all 31 patients are summarized in Table 1. In 15 of 28 patients (54%), US correctly diagnosed the retroperitoneal hematoma and defined precisely which muscle of the iliopsoas compartment was involved (Fig. 1). US examination was nonconclusive in six patients (21%) and provided an incorrect or a false-negative result in seven patients (25%). Abdominal CT examination was performed in 17 of 31 patients (55%) and led to a correct diagnosis in all cases (Figs. 2 and 3). Twenty-five hematomas, including 14 psoas and 11 iliacus hematomas, were diagnosed by CT and/or surgery (considered as the “gold standard” techniques in our study). US diagnostic accuracy was evaluated by comparing echographic observations to CT and surgical findings. The sensitivity of US is 44% (11 of 25 hematomas identified). If the 14 psoas muscle hematomas are considered alone, the sensitivity of ultrasound increases to 64% (9 cases identified). When considering the 11 cases of iliacus muscle hematomas alone, the sensitivity of ultrasound drops to 18% (2 cases identified).

Eighteen of 31 patients (58%) had conservative medical treatment, and 13 patients (42%) had surgical exploration and drainage of the hematoma. Of the 18 patients managed nonoperatively, 8 (44%) had a psoas muscle hematoma, and 10 (56%) had an iliacus muscle hematoma (Table 2). Six of the eight patients with a psoas muscle hematoma had a favorable clinical course. The two remaining patients died, 4 days and 6 weeks after admission. Among the 10 patients with an iliacus hematoma, 5 had a favorable clinical course, 4 had persistent femoral nerve paresis or denervation, and 1 died 7 days after admission. We found 8 (62%) psoas and 5 (38%) iliacus muscle hematomas in the 13 patients who were surgically treated (Table 3). Of the 8 patients with a psoas muscle hematoma, 4 had a favorable clinical course, 3 had a permanent femoral nerve motor deficit, and 1 died of shock. The clinical course was favorable in 4 of the 5 patients with an iliacus muscle hematoma, and 1 patient died from shock.

All of the surgical drainages were performed within 48 hours of admission, except in three patients who were hemodynamically unstable. They developed femoral neuropathy owing to a psoas muscle hematoma. Their hematomas were surgically evacuated after a delay of 3–23 days posthemorrhage.

DISCUSSION

Neuropathy caused by hemorrhage during anticoagulant therapy is an infrequently diagnosed and poorly understood condition. Since 1958 (5), sporadic reports, totaling 100 cases, have appeared in the literature describing a variety of neuropathies resulting from anticoagulant therapies (6, 7).

### Table 1

<table>
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**Figure 1.** Sonogram showing an anteriorly displaced right kidney (RK) by a 10- × 4-cm hypoechogenic mass (arrows), compatible with an acute hematoma of the right psoas muscle.