Intramuscular Hematomas Caused by Anticoagulant Therapy: Is Advanced Age a Risk Factor?

Nilgün ÇINAR, Şevki ŞAHİN, Alper KARAOĞLAN*, Sibel KARŞIDAĞ
Faculty of Medicine, Maltepe University, Department of Neurology, Istanbul, Turkey
*Faculty of Medicine, Maltepe University, Department of Neurosurgery, Istanbul, Turkey

ABSTRACT
Oral anticoagulant therapy (OAT) is very effective in the prevention of cerebral embolism, especially in certain cardiac diseases. Hematomas are the major complication of OAT. It may threaten the patient’s life by bleeding into the vital structures. Herein, we describe four patients with hematomas in the psoas, quadriceps, pectoral, or rectus abdominis muscles accompanied by anemia during warfarin therapy for atrial fibrillation and retroperitoneal hemorrhage. There were no episodes of bleeding or other complications after starting oral anticoagulant therapy during the follow-up. The common aspects of our cases were older age and a history of minor trauma. As a result, we suggest that special attention needs to be paid to the patients under anticoagulant therapy, especially those at an advanced age, and to warn them avoid trauma.

Key words: Anticoagulant, complication, trauma, intramuscular hematoma, psoas, quadriceps, pectoral, rectus abdominis

Introduction
Warfarin is a commonly used anticoagulant that has many clinical indications, including pulmonary embolism, deep venous thrombosis, prosthetic valves, or persistent atrial fibrillation (1). The rate of major extracranial hemorrhage on oral anticoagulant therapy ranges from 0.4%-2.0% per year (2). Bleeding is the major complication of warfarin. Bleeding into the vital structures (i.e., intracranial and pericardial) or massive bleeding into cavities (i.e., gastrointestinal, genitourinary, and retroperitoneal) of the body may threaten the patient’s life (3). Although conservative management is sufficient for patients with neurologic impairment, needle aspiration after autolysis of the hematoma, which can be confirmed by computed tomography (CT), is also recommended (4). Here, we report four cases of psoas, quadriceps, rectus abdominis, and pectoralis hematomas accompanied by anemia during anticoagulant therapy.

Case Reports

Case 1

A 74-year-old male presented to the emergency service with a complaint of weakness of his left leg, which occurred after falling on his hip while getting on a bus. The patient’s past history revealed that he was diagnosed with paroxysmal atrial fibrillation 1 year before and warfarin was administered for prophylactic purposes. His neurologic examination showed spontaneous flexion of the left hip, with tenderness during extension of the hip. Mild weakness during thigh flexion and reduced patellar reflex on the left side were observed. A CT of the brain was performed to rule out a cerebrovascular accident. The results were interpreted as normal. An abdominal-pelvic CT, an image compatible with a hematoma, approximately 9x8 mm in size related to the left iliopsoas muscle and on the left region of the pelvis towards the inguinal canal was observed (Fig. 1). The warfarin treatment was discontinued. The patient’s international normalized ratio (INR) was within the therapeutic range (2.1). The activated partial thromboplastin time (aPTT) was 41 seconds and there were 256,000 platelets per high-power field. The protein C and S levels and the antithrombin III activity were within normal limits.

The hemoglobin (Hb) level dropped from 9.7 g/dL to 7.6 g/dL. The patient was transfused with one unit of packed red blood cells. Low-molecular-weight heparin (LMWH) therapy (enoxaparine [0.6 mg/day]) was administered to the patient in order to prevent embolic events on the 3rd day of absolute bed rest. Forty percent resorption of the hematoma was observed on the repeat abdominal-pelvic CT by the end of the first week. The patient was discharged and was suggested to continue bed rest and LMWH therapy. On a CT examination performed after 15 days, the hematoma had substantially resorbed, therefore, warfarin therapy was restarted.

Case 2

An 80-year-old woman presented to our emergency service with a complaint of severe weakness on the left side of her body. Since no acute hemorrhage or ischemia was observed on the patient’s brain CT examination, an ischemic stroke was considered. The patient’s history revealed that she was under warfarin treatment because of a pulmonary embolism due to paroxysmal atrial fibrillation. The INR value was not within the therapeutic range (INR, 0.3). Therefore, a heparin infusion and warfarin therapy (5 mg/day) were administered. After 5 days of uneventful therapy, she complained of acute-onset right thigh pain. The patient’s nurse noted that she hit her right leg on the edge of her bed the previous night while trying to get out of it. At the time of evaluation, her laboratory values were as follows: INR, 1.4; aPTT, 58.7 seconds; and platelets, 137,000 per high-power field. Her Hb level dropped from 9.7 g/dL to 4.4 g/dL. The protein C and S levels and the antithrombin III activity were within normal limits. The patient was transfused with two units of packed red blood cells. Her anticoagulation treatment was discontinued. Magnetic resonance imaging (MRI) of the right femur revealed a liquid collection with a lobulated contour on the right side of her thigh (approximately 27 cm in size), which appeared on the vastus lateralis and rectus femoris (Fig. 2). Conservative approaches were attempted for the treatment. Bandage and cold compress were applied to her thigh in addition to the bed rest and the vital signs were monitored. The volume of the hematoma began to decrease on the 4th day. In the 1st week, 0.6 mg/day of enoxaparine was initiated. By the end of 15th day, warfarin therapy was re-administered to the patient after a clinical observation of regression of the lesion on her thigh. The patient is now being followed for 6 months without any problems.

Case 3

A 73-year-old female patient presented to the emergency service due to palpitations and feeling faint. The patient had an acute atrial fibrillation attack, was heparinized, and cardioversion was applied. The patient was hospitalized and warfarin was administered. On the 3rd day of the follow-up, abdominal distension and somnolence developed. At this time, her laboratory values were as follows: INR, 1.8; aPTT, 63 seconds; and platelets, 423,000 per high-power field. The protein C and S levels and the antithrombin III activity were within normal limits. The Hb level dropped from 12.3 g/dL to 7.4 g/dL. A cerebral CT examination of the patient was interpreted as normal. The abdominal CT revealed a large organized hematoma, 210x182x142 mm in diameter, in the lower half of the inferior rectus towards the retroperitoneal area (Fig. 3). The anticoagulant therapy was stopped and the hematoma was drained surgically. Warfarin therapy was restarted on the 10th day postoperatively. The patient has now been followed for 3 months without any symptoms.

Case 4

A 72-year-old female patient presented to our emergency service because of generalized tonic-clonic seizure. The patient’s history revealed that she underwent mitral valve replacement surgery 20 years ago due to a rheumatic mitral valve disease and that she had been on warfarin therapy since that time. In addition, she had an ischemic stroke 7 years ago, and presented with left hemiparesis and an epileptic seizure. It was stated by her family that she was not taking her antiepileptic medication regularly. Control of her seizures was achieved with intravenous diphenylhydantoin administration at a dose of 1000 mg/day. On cerebral CT examination, an infarct area compatible with an acute period was observed in the area of the left middle cerebral artery (MCA) in addition to a sequel to an infarct area involving the right MCA. The INR value was 1.3. Warfarin therapy accompanied by a standardized heparin infusion was administered to the patient. On the 7th day of hospitalization, her INR value was 2.4, and swelling and increased temperature were observed in the left chest area. The protein C and S levels and the antithrombin III activity were within nor-
At that time, the Hb value decreased from 12.5 mg/dl to 8.4 mg/dl, which was the value of the day before. One unit of erythrocyte suspension was transfused to the patient. As a result of the thoracic CT examination, a lesion compatible with a pectoral hematoma with the widest size of approximately 12x17 cm on the anterior wall of the left hemithorax extended towards the axillary fossa, with a visualized fluid level inside (Figure 4). Ecchymotic areas and traces of fingernails were observed on the axillary level of the patient. Hemorrhage was considered to have developed as a result of the trauma, which occurred while lifting the obese (128 kg) patient. The anticoagulant therapy was discontinued for 5 days. Cold compresses and intense bandage monitoring were performed. On the 5th day, after observation of significant resorption of the hematoma, anticoagulant therapy was re-administered. An increase in the hematoma size was not observed again. Rehabilitation of the patient, who is stable, is still continuing.

Discussion

Warfarin acts by blocking vitamin K-dependent reducing enzymes, which provide carboxylase substrate, which in turn is utilized for the activation of coagulation factors II, VII, IX, and X (5). Bleeding is the most frequent complication of OAT.

There are many risk factors associated with anticoagulation-induced hemorrhage. The most common one is high plasma level of anticoagulants, which is measured by INR (3). Not only the anticoagulant dose, but also other factors, such as diet, medical conditions, and co-administered medications may affect the level of anticoagulation (6). Additionally, any history of drug usage or diet, which may affect the blood warfarin levels, was not identified in these patients. However, at the time of hemorrhage, INR levels were within or below the therapeutic range; additionally, protein C and S levels and the antithrombin III activity were within normal limits in all of our cases. Also, Lowe reported that the aPTT, PT, and INR values of most patients were within the therapeutic anticoagulation range and the risk of bleeding with anticoagulants was non-linearly related to the INR (8). Moyer et al. explained this situation by genetic differentiations among the races, which can alter the pharmacodynamic of coumarin derivatives.

Figure 3. Axial CT of the abdomen showed a large organized hematoma, measuring 210x182x142 mm in diameter, located in the lower half of the inferior rectus muscle (arrow).

Figure 4. Pectoral hematoma (arrow) with the widest size of approximately 12x17 cm on the anterior wall of the left hemithorax, lying towards the axillary fossa with a monitored liquid level, was found on the axial CT of the thorax (arrow).
The first patient suffered from an iliopsoas hematoma during the anticoagulant therapy. Sasson et al. reported that hemorrhage into the iliacus, psoas, and iliopsoas muscles was an infrequent complication of anticoagulant therapy and usually occurred unilaterally (7). In agreement with this report our patient had left iliopsoas hematoma. Daily examination of our patient’s blood indicated that a PTT, PT, and INR were within the therapeutic range when the bleeding started, and before the initial symptoms occurred.

Several authors have suggested different surgical approaches for psoas hematoma treatment, including surgical decompression (10). For suitable cases, transcatheter arterial embolization (TAE) is one of the preferred treatment methods (11). In our case, conservative therapy was considered to be satisfactory as the hematoma in our patient was small in diameter.

In our second case, hemorrhage developed inside the quadriceps femoris muscle of the femoral area? Nadeem et al. presented cases of hemorrhage in the femoral area, which developed during anticoagulant therapy following knee surgery with a subsequent application of decompression (12). Sakakibara et al. reported hemorrhage in the lower extremity muscles in four cases on warfarin treatment following cardiac valve replacement. They applied needle aspiration in some of the cases (4). We treated the present case with conservative methods.

In our third case, electrical cardioversion was applied and warfarine was started. A retroperitoneal hematoma was detected after three days. Surgical management of a retroperitoneal hematoma is controversial. Surgical options include decompressive evacuation of the hematoma, either through open or percutaneous means (10). The decompressive surgery was effective in this case of the retroperitoneal hematoma caused by cardioversion and anticoagulant therapy.

Hemorrhage was determined within the pectoral muscle in the last case. A hematoma in the pectoral muscle is rarely encountered in the literature. Kocer et al. (13) presented cases of spontaneous intra-pectoral bleeding. Armstrong et al. (14) reported a pectoral muscle hematoma during the prophylaxis of deep vein thrombosis in a case injured by thoracic trauma. It was considered that in the present case of a pectoral muscle hematoma, lifting the patient by holding her from the axillary area of the plegic side by her relatives triggered the situation and traces of fingernails on the ecchymotic areas of the axillary area were observed.

In the present cases, old age is the common denominator. The role of old age on the risk of hemorrhagic complications of warfarin is studied by some studies (15,16,17). Age has been reported to increase the rate of major bleeding from 1.5% for patients < 60 years to 4.2% for those > 80 years (hazard ratio, 2.7; 95% CI, 1.7-4.4) (18).

Fang et al. stated that older age increases the risk of major hemorrhage, particularly intracranial hemorrhage, in patients with atrial fibrillation, who are taking warfarin (19). Russmann et al. suggested that older patients are more prone to complications than younger patients, probably due to their reduced metabolic clearance (20).

There are also cases in whom hemorrhage developed in areas other than the visceral chambers, in which the hemorrhage is frequently expected during anticoagulant therapy. For example, a sublingual hematoma was reported by Ozpolat et al. in a case of a treatment of anticoagulants for pulmonary thromboembolism prophylaxis (3). The present cases are rare as they have intramuscular hemorrhage.

The common features of our cases were the advanced ages and history of minor inevitable traumas. There was a history of trauma in most of the spontaneously developed cases reported in the literature (3,12,14). As a result, the evaluation of these cases suggests that patients on anticoagulation therapy should be examined carefully for hematomas. Also, we conclude that the conservative management for intramuscular hematomas might be preferred in advanced age.

References