Acute Sciatic Nerve Palsy as a Delayed Complication of Low-Molecular-Weight Heparin Prophylaxis After Total Hip Arthroplasty

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Sciatic nerve palsy is a recognized complication of total hip arthroplasty (THA).[1,2] The low incidence of this complication ranges from 0% to 3.7%.[1] Delayed-onset acute sciatic nerve palsy due to hematoma is rare. With recent increased use of potent anticoagulants for thromboprophylaxis, the incidence of sciatic palsy secondary to local hematoma has increased.[3]

In this article, we report the case of a patient who underwent primary THA and, over a few hours on postoperative day 3 (POD3), developed complete sciatic nerve palsy due to local bleeding secondary to low-molecular-weight heparin (LMWH) prophylaxis. Our patient was informed that the data concerning his case would be submitted for publication.

Case Report

At our clinic, a man in his mid-70s presented with severe osteoarthritis of both hips. Orthopedic examination revealed bilateral coxalgic gait, painful and limited range of motion of both hips, worse on the right side. Patient height was 1.65 meters; weight was 72 kilograms. Medical history was significant for polycythemia vera, ulcerative colitis, mild hypertension, and benign prostate hypertrophy. The patient's hematologist had followed him for 10 years; there was no history of thromboembolism or bleeding. Preoperative neurologic examination was normal. Given the medical history, a decision was made to proceed with staged bilateral THA.

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The patient was medically cleared for right THA. Given the history of polycythemia vera, he was strongly encouraged to accept postoperative thromboprophylaxis with warfarin and initial LMWH bridging until the international normalized ratio was found to be therapeutic. As hematocrit was very high, he predonated 2 units of autologous blood. Preoperative laboratory values were 14.4 g/dL hemoglobin, 45.6% hematocrit, 557,000 platelet count, 10.4 seconds prothrombin time (normal, 9.2-11.4 seconds), 33.2 seconds activated partial thromboplastin time (normal, 23-34.1 seconds), and 3400 white blood cell count.

Under epidural anesthesia, the patient underwent uncomplicated hybrid right THA through a posterolateral approach. Immediate postoperative laboratory values were 13.6 g/dL hemoglobin, 41.0% hematocrit, and 580,000 platelet count. Warfarin 5 mg was started the evening of the day of surgery, but enoxaparin was held until noon of POD2 because of the presence of the epidural catheter,[4] which was removed the evening of POD1 in accordance with American Society of Regional Anesthesia consensus conference guidelines.[5,6] Following the recommendation of the patient's hematologist, we ordered enoxaparin 30 mg subcutaneous twice a day, which is the prophylactic dose recommended in the American College of Chest Physicians guidelines. Drains were removed on POD1; total drainage was 350 mL. Given the patient's history of polycythemia vera, computed tomography scans (pulmonary and lower extremities) were obtained on POD1; these scans ruled out thromboembolism.

The patient had an uneventful medical course and recovery with twice-daily physical therapy until the afternoon of POD3, when, rising from a toilet seat, he felt acute, severe pain in the right hip. With the help of a physical therapist, he walked to his bed. The pain increased, and he was examined by an adult reconstruction fellow. The right lower extremity neurovascular examination was normal, with full sensation and motor strength. The patient was encouraged to perform ankle pumps (active plantar and dorsal flexion of the ankles) as part of our multimodal thromboembolism prophylaxis. A hip radiograph confirmed good position and fixation of the components. In the next hours, the patient complained of severe persistent pain, paresthesias in the lower extremity, and progressive

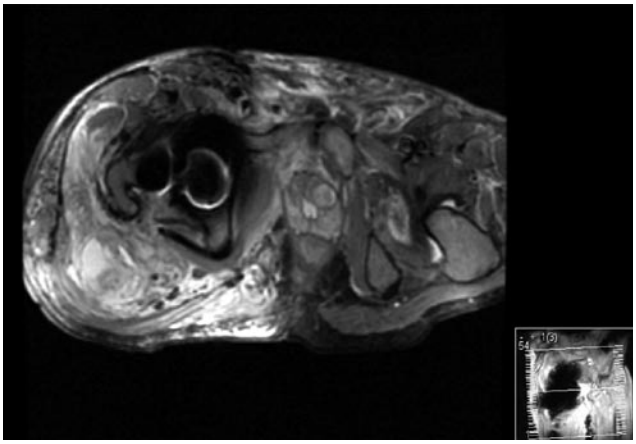

Figure 1. Magnetic resonance imaging shows a massive hematoma displacing the sciatic nerve at the level of the greater trochanter.

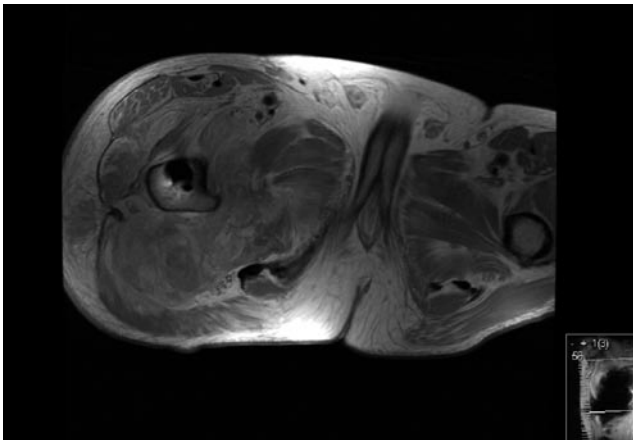

Figure 2. Magnetic resonance imaging shows the hematoma at the level of the lesser trochanter.

muscle weakness of the right foot and ankle. Physical examination confirmed subtotal distal sciatic nerve dysfunction. Emergency magnetic resonance imaging of the right hip, with metallic artifact minimization,[7] revealed an acute hematoma compressing the sciatic nerve (Figures 1, 2). Enoxaparin was held; the international normalized ratio was 1.27. The sciatic palsy progressed to total paralysis during this night. A decision was made to take the patient back to the operating room early the next morning, 20 hours after enoxaparin was last administered and 500 mL of hematoma was drained. There was no active bleeding at this time, and the sciatic nerve was explored and confirmed to be intact. The wound was closed in layers over drains, which remained in place for 48 hours. Warfarin was started for thromboprophylaxis. An ankle–foot orthosis was prescribed to prevent equinus contracture and help ambulation. Hospital stay was 22 days.

At the 6-week postoperative visit, neurologic examination was unchanged, but the patient reported a subjective improvement in the sensation of the dorsum of the right foot. At latest (11-month) follow-up, neurologic examination was unchanged; there was total motor paralysis of the right sciatic nerve.

Discussion

Immediate acute sciatic nerve palsy, a recognized complication of THA, may be caused by direct injury, compression from a retractor, traction, thermal injury from bone cement, or hematoma formation.[1,3,8,9] It is a rare complication of hematoma formation in the lumbar spine subsequent to traumatic epidural catheter insertion.

We have reported the case of a delayed-onset (POD3) total sciatic nerve palsy that developed as a consequence of thromboprophylaxis with aggressive, potent anticoagulants. This case adds to the existing evidence that use of anticoagulants can have serious complications. Furthermore, it emphasizes the importance of early suspicion when acute, severe pain compromising sciatic function develops during potent anticoagulation.

At our institution, use of LMWH anticoagulation is not encouraged. Each patient undergoing THA or total knee arthroplasty is assigned to a low-, intermediate-, or high-risk thromboembolic group.[10] All patients receive our multimodal thromboprophylaxis[11] protocol consisting of preoperative discontinuation of procoagulant medication[10] and autologous blood donation[12]; hypotensive epidural anesthesia[13,14]; expedient surgery minimizing femoral vein occlusion and blood loss, and repeated aspiration of the intramedullary canal to prevent passage of procoagulants and intramedullary contents to the venous circulation[15-17]; intraoperative administration of intravenous heparin (10-15 U/kg) before femoral preparation, and immediate postoperative use of knee-high elastic stockings[18]; and early mobilization, emphasizing repeated and vigorous active dorsiflexion of ankles as soon as motor function of the lower extremities has recovered from regional anesthesia. In addition, pharmacologic thromboprophylaxis is used—either aspirin or warfarin, depending on surgeon preference and the relevance of predisposing risk factors for thromboembolism.[10] According to our most recent (2006) report on the safety and efficacy of multimodal thromboprophylaxis,[4] encompassing 1,946 consecutive patients undergoing elective THA (aspirin given to 87% of them), there were no cases such as the one reported in the present article.

In 2005, Butt and colleagues[3] reported on 6 patients who underwent primary THA and developed hematoma-induced sciatic nerve palsy. All 6 patients received LMWH prophylaxis and had no history of bleeding disorders. The author's historic incidence of sciatic palsy was 0.2% before June 2002. The year after implementation of LMWH prophylaxis, incidence increased to 1.69% (6/355 consecutive THAs). Butt and colleagues suggested that final outcome depends on time between palsy onset and hematoma evacuation. The last 3 patients who underwent reoperations within 48 hours recovered completely.[3] In our patient's case, the nerve was decompressed 14 hours after onset of hip pain and 12 hours after onset of sciatic nerve symptoms.

Weil and colleagues[19] reported the case of a 70-year-old woman who underwent THA and then had a delayed-onset complete sciatic nerve palsy after being treated for a pulmonary embolism with tissue plasminogen activator. The patient underwent decompression of the sciatic nerve after cessation of anticoagulation and placement of an inferior vena cava filter. By 10 months after surgery, she had regained full motor strength and was ambulating without braces or aids.

Ben-David and colleagues[20] reported on a 30-year-old man who underwent uncomplicated THA with normal sciatic motor function after surgery. The patient received enoxaparin 25 mg subcutaneous twice a day (for prophylaxis) and developed a sciatic nerve palsy progressing from pain and paresthesias to complete loss of motor function over 2 to 3 hours on POD2. Surgical decompression was performed within 7.5 hours after symptom onset, the result being nearly complete resolution of motor and sensory deficits 48 hours after surgery.

Polycythemia vera is a chronic myeloproliferative disorder with major morbidity and mortality associated with thrombohemorrhagic events and progression to acute leukemia or myelofibrosis. Whether hematocrit and platelet count predict such complications remains unclear.[21] Patients with this disorder are considered at high risk for postoperative thromboembolism as well as bleeding. Their platelets become hypersensitive and have a short lifespan.[22] With low-dose-aspirin therapy, these changes appear to revert to normal.[23]

Postoperative hematoma resulting in delayed sciatic nerve palsy secondary to anticoagulation should be considered a preventable iatrogenic injury. Potent anticoagulants are associated with increased local and general complications, such as development of superficial and deep wound infection[24] and delay in recovery of range of motion after total knee arthroplasty.[25]

Anticoagulation was an option for our patient, but other options exist. In the recently released *Clinical Guideline on Prevention of Symptomatic Pulmonary Embolism in Patients Undergoing Total Hip or Knee Arthroplasty,* the American Academy of Orthopaedic Surgeons[26] contemplated stratifying patients according to preoperative risk (normal or elevated) for pulmonary embolism and bleeding. For patients at high risk for thromboembolism and bleeding, such as the patient in the present report, a prophylactic vena cava filter may be considered without aggressive anticoagulation. If potent anticoagulation is selected, the surgeon should remain vigilant regarding potential bleeding complications.[1,3,9,19,27] When a hematoma compressing the sciatic nerve is clinically suspected, it should be ruled out; if confirmed, the hematoma should be decompressed expeditiously, as soon as anticoagulation has been reversed. There is no consensus regarding time from onset of sciatic nerve irritation to decompression and final clinical outcome in terms of return of sciatic nerve function.

Authors' Disclosure Statement

The authors report no actual or potential conflict of interest in relation to this article.

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