Acute compartment syndrome consists of increased tissue pressure in a closed anatomical area leading to decreased vascular perfusion. It is frequently caused by trauma, fractures, or compression injuries1-16 and usually occurs in the forearm or lower leg. Reports of acute compartment syndrome of the thigh, especially without an associated fracture, are rare.1,2,4,5,10,11,14

This article presents posterior thigh compartment syndrome following an avulsion of the semitendinosus and long head of the biceps femoris muscles in a patient on chronic coumadin therapy for protein S deficiency, a common hypercoaguable state. This is the only reported case of posterior thigh compartment syndrome caused by a hamstring avulsion.

CASE REPORT

A 39-year-old man presented with posterior left thigh pain 4 hours after attempting to perform “splits” while dancing. The patient heard a pop while attempting to abduct his hips to 90° from the vertical. History was significant for recurrent deep venous thromboses in the left thigh and calf secondary to a hypercoaguable state caused by protein S deficiency. He was taking 10 mg of warfarin per day prophylactically.

On presentation, vital signs and physical examination were normal except for the left lower extremity. The left anterior thigh was soft and nontender. The left posterior thigh had a 10-cm diameter ecchymotic area just distal to the gluteal fold. The entire posterior thigh was swollen, tense, and painful to light touch from the gluteal fold to 5 cm superior to the posterior knee.

Knee extension was 5/5 and knee flexion could not be assessed due to pain. Ankle plantar flexion, ankle eversion, and great toe flexion were 2/5. Ankle dorsiflexion and great toe extension were 0/5. The left foot was anesthetized on the dorsum and lateral aspect. Sensation was present, but decreased on the plantar aspect of the left foot. Dorsalis pedis and posterior tibial pulses were 2/11. Laboratory studies were normal except for an International Normalized Ratio (INR) of 6.1 (normal range: 0.88-1.12). Plain radiographs of the pelvis and left thigh were unremarkable.

Anticoagulation was emergently reversed using 2 U of fresh-frozen plasma. Approximately 8 hours after initial injury the patient was taken to the operating room with an INR of 2.1. The patient was placed in the prone position and a posterior incision was made from the gluteal fold to 5 cm above the popliteal fossa. A complete fasciotomy and release of the posterior compartment was performed. Approximately 900 mL of hematoma exited the wound forcefully when the investing fascia of the flexor compartment was released. The muscles appeared dark red, but viable, and the semitendinosus and long head of the biceps femoris were completely avulsed from the ischial tuberosity (Figure). The avulsed tendon was not repaired. Active bleeding was minimal and easily controlled with cautery.

Postoperatively, the patient had immediate pain relief. By discharge on postoperative day 4, the sensation on the plantar aspect of the foot had returned to normal and the sensation on the dorsum of the foot had improved markedly, with the patient only reporting subjective paresthesias. Motor strength was 5/5 in ankle plantar flexion, ankle eversion, and great toe flexion. Motor strength was 4/5 in ankle dorsiflexion and great toe extension. Postoperative anticoagulation consisted of 25,000 U subcutaneous dalteparin daily starting on postoperative day 4. Five months postoperatively, the patient exhibited full return of motor function and sensation.

DISCUSSION

Acute compartment syndrome of the thigh is rare, and usually is associated with femoral fracture,1,5,6,8,9,13 contusion,1,2,4,5,10 or compression...
injury. Several authors postulate the large volume of the thigh makes development of a compartment syndrome less likely compared with the forearm or lower leg, which have lower volumes. 

Compartment syndrome in the thigh usually occurs in the anterior compartment. In 17 cases of posterior thigh compartment syndrome, 10 were associated with a femoral fracture. Of the 7 remaining cases, 4 were due to direct trauma and 3 to prolonged compression. Posterior thigh compartment syndrome caused by avulsion of the hamstrings origin or by hemorrhage in an anticoagulated patient has not been reported previously.

Protein S is a vitamin K dependent protein that antagonizes clotting factors V and VIII by acting as an accelerator of clotting factors. Deficiency of protein S, an autosomal dominant disorder with an estimated prevalence between 0.03% and 0.13% in the general population, has been reported previously. An HS, Simpson JM, Gage S, Jackson WT. Acute anterior compartment syndrome in the thigh: a case report and review of the literature. Clin Orthop 1988; 234:232-234.

References

6. Mubarak SJ, Owen CA, Hargens AR. Fasciotomy of both compartments via a lateral incision is recommended to ensure adequate decompression of the thigh. In our case, the compartment syndrome was isolated to the posterior compartment. Decompression of the posterior compartment was performed via a direct posterior approach to improve exposure in the event of continued active bleeding; the tissue dissection also was minimized in anticipation of resuming the anticoagulation therapy.