CHAPTER **45**

SPONTANEOUS CALF HEMATOMA: A Case Report

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When we hear the word hematoma, we often associate it with a postoperative complication that requires incision and drainage and possible intravenous antibiotics when infected. The term hematoma is defined as a swelling or mass of blood that is usually unclotted and is confined to an organ, tissue, or space, and is caused by a break in a blood vessel.[1] Hematomas may develop spontaneously due to a traumatic event or they may develop slowly in a chronic expanding form following surgery or vascular defect. Nevertheless, hematomas may be present for months and can often be very debilitating to the patient. If left untreated, hematoma formation can result in infection, delayed wound healing, compartment syndrome, myonecrosis, loss or weakening of limb function, neurovascular impingement, myositis ossificans and even amputation. This collection of blood may coagulate over time and delay the work of red blood cells that carry oxygen where it is needed, and also impede the work of the white blood cells in removing destroyed cells. All of these factors can delay the wound healing process, and lead to a longer recovery period.[1]

CASE STUDY

A 51 year-old male presented to the author's institution complaining of an extremely swollen left calf (Figure 1). The patient denied any pain and reported a skiing injury that occurred approximately four months prior. The patient also related that after a bad fall, his left calf swelled up immediately like a balloon and developed a bruise to the affected area, which lasted nearly 2 weeks. He claimed that he heard a "pop" in his calf muscle. The patient related that initially he was seen by the emergency team at the ski slope, where they diagnosed him with a bruise to his calf and treated him with ice, a compression dressing, ibuprofen for pain, and was given a pair of crutches. The pain had subsided after two weeks, however, the patient complained of progressive weakness to his left lower extremity, with early fatigue upon exercising. The swelling has not increased or decreased over time and has remained the same since the initial injury. He denied any numbness, tingling or other neurological symptoms. The patient also denied any fevers, chills,

Figure 1. Severe swelling of the posterior-medial aspect of the left calf was noted 4 months after a skiing injury.

Figure 2. Notice obvious difference in calf circumference. The left calf was 19" compared to the uninvolved side being 16".

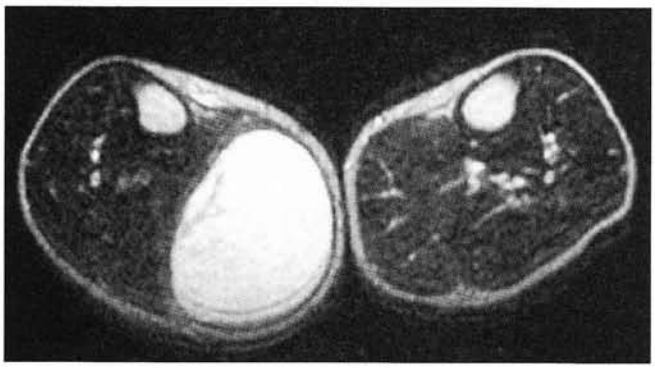

Figure 3. T2-weighted MRI demonstrating a marked increase in signal intensity, indicating that the mass was fluid filled.

Figure 4. Notice how the entire medial head of the gastrocnemius muscle belly was involved.

Figure 5. The mass is well encapsulated, homogeneous and does not involve any bone, which are all terms usually associated with benign lesions.

Figure 6. Incision planning: linear incision slightly medial to midline.

or shortness of breath. The patient's medical history was unremarkable.

Upon physical examination pulses were intact and all epicritic sensation was within normal limits. The Achilles tendon was intact without a palpable defect. There was a negative Thompson's test. The gastrosoleal complex on the affected side demonstrated a 3/5 with manual muscle testing, when compared to the contralateral limb 5/5. There was marked edema to the posteromedial aspect of the left calf muscle (Figure 2). Calf circumference was measured at 19 inches compared to 16 inches on the unaffected side. No erythema was noted and skin temperature appeared slightly warmer on the affected side. No pulsatile mass was felt, yet the posteromedial calf appeared indurated and tense. There was also no pain elicited with palpation along the course of the posterior musculature.

Plain radiographs of the left leg demonstrated an increase in soft tissue density and volume associated with the medial gastrocnemius muscle belly. Magnetic resonance imaging (MRI) demonstrated a soft tissue mass approximately 9 x 6 cm in dimension. The mass was homogeneous and well encapsulated. T2-weighted MRI demonstrated an increase in signal intensity, associated with fluid. There was no involvement of the tibia. The mass seemed to encompass the whole medial head of the gastrocnemius muscle belly and appeared to be either a fluid filled cyst or hematoma.(Figures 3-5).

At this time it was deemed necessary to take

the patient to the operating room for an incision and drainage with evacuation of possible hematoma. The patient was placed on the operating table in the prone position and the left leg was prepped and draped in a sterile fashion. A pneumatic thigh tourniquete was applied and inflated to 350 mmHg.

A linear incision was created over the posterior-medial aspect of the left gastrocnemius muscle (Figure 6). The incision was carried through the skin down to the level of the subcutaneous tissues, being careful to avoid all neurovascular structures. All crossing veins were ligated to maintain adequate surgical hemostasis. A deep fascial incision was then made overlying the posteromedial aspect of the gastrocnemius muscle belly and immediately, approximately 80 ccs of hematoma came pouring out of the wound (Figure 7). The remaining hematoma was organized into a gelatinous, yet hemorrhagic material that was also evacuated (Figure 8). Cultures were taken and sent for cytology analysis and hematoma was sent for pathologic analysis. The wound was then copiously lavaged with sterile saline. At this time there a pseudocapsule present, which housed the evacuated hematoma. This pseudocapsule, which appeared to be made of paratenon and epimysium tissue, was completely debrided (Figure 9). The medial head of the gastrocnemius was completely absent. The remaining muscle fibers were necrotic and debrided as well. A very large dead space was present after evacuation of the myonecrosis and hematoma (Figure 10). This was addressed with insertion of closed-suction drains (Figure 11). The tissues were then reapproximated and a Jones compression dressing was applied.

The patient was admitted for observation and received intravenous antibiotics. The pathology report described a fibrous capsule with myonecrosis and hemorrhagic material compatible with an old hematoma. No evidence of neoplasm was seen. The cytology report came back negative for atypical or malignant cells. No organisms were isolated as well. The patient was sent to physical therapy once all healing had occurred to help strengthen the posterior musculature, and is currently doing well (Figure 12).

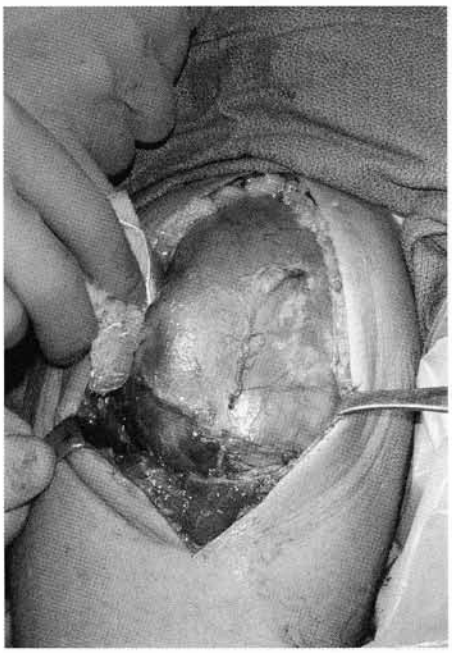

Figure 7. Deep fascia and paratenon exposed after careful subcutaneous dissection. Incision through the deep fascia exposed ~ 80 ccs of liquid hematoma.

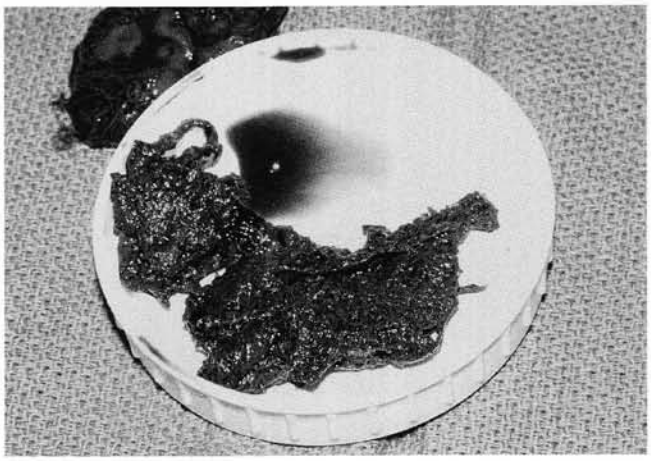

Figure 8. Organized, fibrous hematoma with mynecrosis evacuated from the medial head of the gastrocnemius muscle belly.

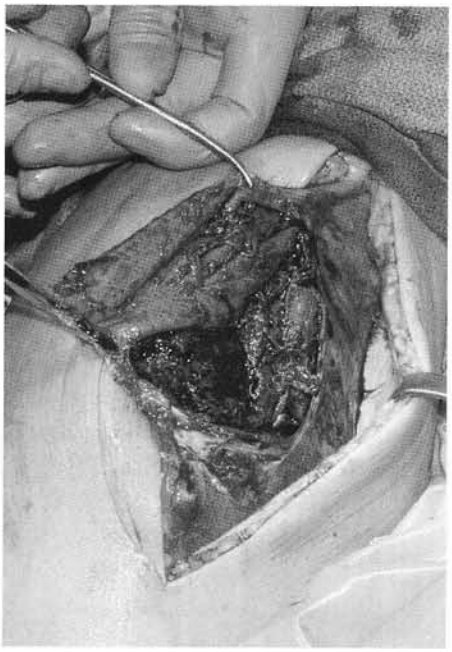

Figure 9. Notice a pseudocapsule which housed the hematoma. This was debrided well.

Figure 10. Dead spaceî with absent medial head of gastrocnemius muscle belly.

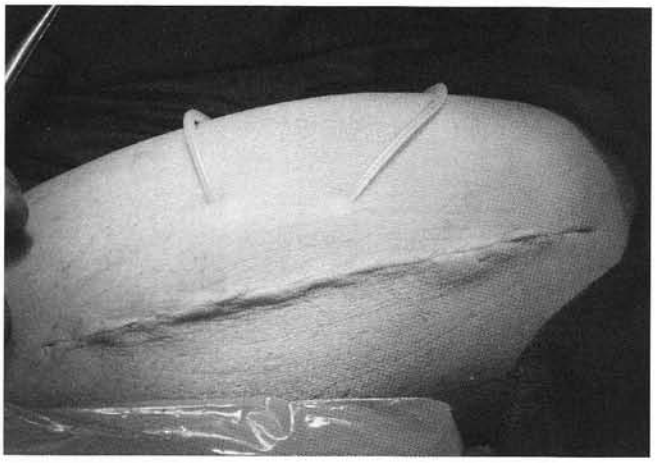

Figure 11. Closed-suction drains were used postoperatively to help deal with the large remaining dead space.

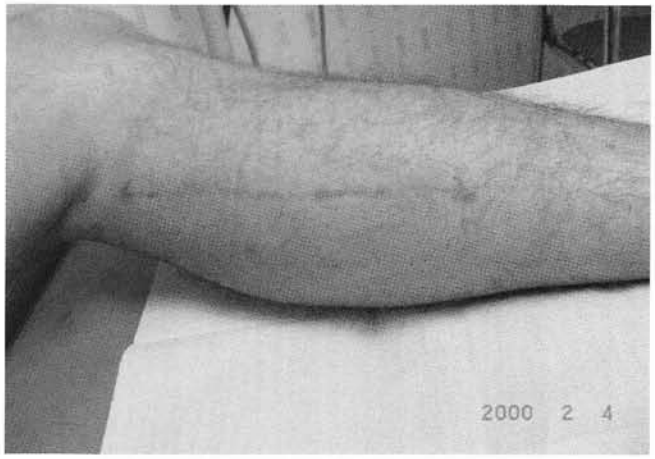

Figure 12. The patient at 3 month follow up. Patient is doing well and going to physical therapy to help strengthen his posterior muscle group.

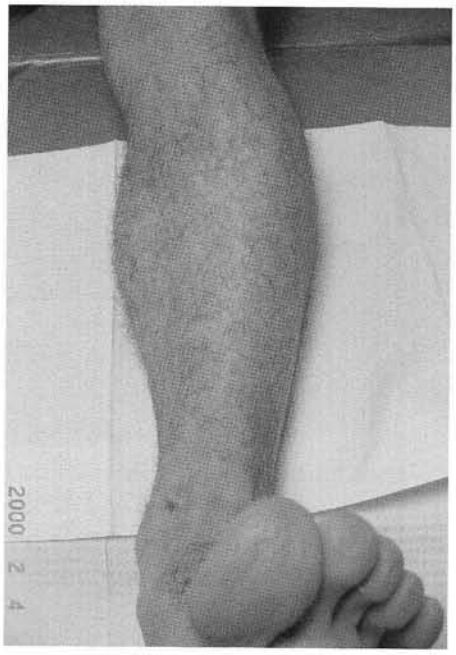

Figure 12B.

DISCUSSION

Hematoma is a collection of blood confined to a specific area. It commonly occurs in the athlete after blunt trauma, such as a football player would get on his thigh from a hard hit from a helmet. Initial treatment should include R.I.C.E. as well as antiinflammatory medications. Aspiration and evacuation may also be performed early on when the hematoma is in the liquid form and has yet to organize. Physical therapy has also been advocated to "milk out" the hematoma with manipulations. However, initially the patient may be in a severe amount of pain and may not be able to freely move the extremity. If left untreated, the hematoma may consolidate and lead to multiple problems including infection, delayed wound healing, neurovascular impingement, compartment syndrome, myonecrosis, loss or weakening of limb function.[2] Aggressive and early treatment is recommended to prevent any potential complications. Following elective or emergent surgery it is wise to use closed suction drains, especially if there was a large amount of bleeding or a large dead space was created after removal of a space-occupying lesion or mass.

When evaluating a soft tissue mass, it is extremely important to obtain a good history and physical examination. Is the mass pulsatile, and perhaps vascular in nature? Is the mass freely mobile, which could mean it may be located in the subcutaneous tissues? Does it transilluminate light, which usually means that the mass contains fluid?

Also, imaging techniques may be used to help confirm your diagnosis, especially if it is a chronic case. If the mass appears to be homogeneous, well encapsulated, and does not violate the cortex of the bone, then it is most likely benign. If the mass is heterogeneous, with indistinct borders, and involving the cortex of a the adjacent bone, malignancy is a possibility. MRI of the mass may help confirm the diagnosis by focusing on soft tissues. Bone scans may also be utilized if malignancy is suspected.

A hematoma that is left untreated can lead to serious consequences. It is crucial to act early and be aggressive when dealing with an acute, spontaneous form of hematoma. The use of closed-suction drains may certainly decrease the risks of developing post-operative hematomas, especially when there is a dead space.

REFERENCES

1. Bonutti PM, Bell GR/ Hematoma formation after injury. *J Orth Trauma* 1982;6:229-32.
2. Delond DR. Hematoma pathophysiology. *J Vasc Surg* 1980;4:123-5.