

Morel-Lavallée Lesion in a Professional American Football Player

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ABSTRACT

A Morel-Lavallée lesion is a relatively rare condition involving a closed, degloving injury to the pelvis, resulting in a blood-filled cystic cavity created by separation of the subcutaneous tissue from the underlying fascia. This injury typically occurs following high-speed trauma.

We describe a case that occurred in a professional American football player who was treated with percutaneous decompression and evacuation of the hematoma. The player returned to playing football at the professional level 22 days after the injury without residual deformity or disability.

Closed, internal degloving is a significant soft-tissue injury typically associated with pelvic trauma in which the subcutaneous tissue is torn away from the underlying fascia, creating a cystic cavity filled with hematoma and liquefied fat. It is

most commonly seen over the greater trochanter, flank, and lumbodorsal region. When this closed, internal degloving occurs over the greater trochanter, it is known as Morel-Lavallée lesion.

We describe the clinical course of a professional American football player who sustained this isolated lesion following a routine play. The signs and symptoms of this injury, imaging findings, surgical treatment, and return to play are outlined in this

entire lower extremity. Pulses were equal to the contralateral foot. An attempt to aspirate fluid from the anterolateral aspect of the thigh using an 18-gauge needle was unsuccessful.

The patient's progressive increase in pain and thigh swelling led to admitting him to a local hospital out of concern of impending thigh compartment syndrome. Prior to transport, he sustained a vasovagal episode felt to be secondary to blood loss in the thigh. His blood pressure

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report. The authors have obtained the patient's written informed consent for print and electronic publication of the case report.

CASE REPORT

A healthy wide receiver in his early 30s on no medications dove onto an artificial turf surface while attempting to catch a pass. The player initially complained of left thigh pain and swelling but was able to continue play.

He was evaluated by the team's medical staff immediately after the game and was found to have a tense left thigh and ecchymosis extending into the trochanteric region. The patient demonstrated pain with passive knee flexion and hip extension. Motor strength was 4/5 to hip flexion, abduction, and knee extension, and 5/5 in all muscle groups distal to the knee. Sensation was intact to the

was 90/50 mmHg with a pulse of 88 beats per minute. Hematocrit upon admission was 29.4%. Despite the hematoma present along the anterolateral thigh, the patient's adductor compartment, anterior compartment, and buttock musculature remained soft and non-tender to palpation.

Intravenous fluids were initiated and he was maintained on strict bed rest with elevation of the left lower extremity. Allopurinol 300 mg three times a day and vitamin E 400 IU once a day were given as prophylactic measures to reduce the rise in intracompartmental pressure based on experimental evidence of these agents ablating free radicals generated during reperfusion.¹ Hyperbaric oxygen was also initiated on the evening of admission.² The patient's hematocrit decreased to 27% and further decreased to 26.5% on the

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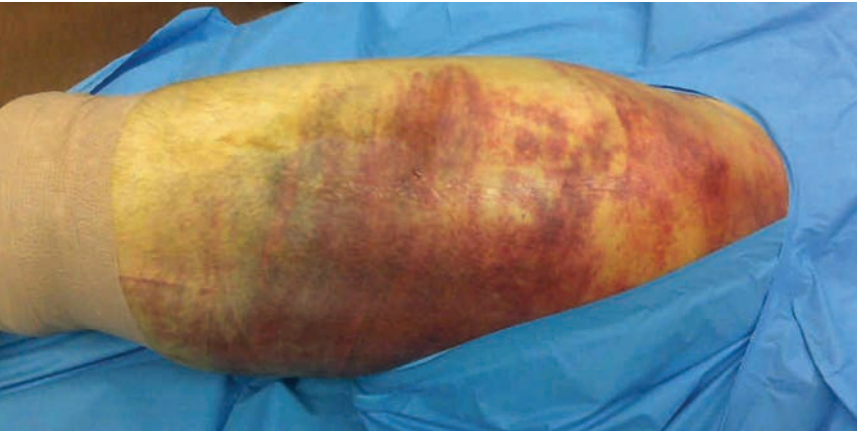


Figure 1. Left thigh demonstrates ecchymosis of lateral thigh.

third day of hospitalization. Physical therapy was initiated consisting of gentle range of motion exercises to the left hip and knee. The patient was transferred home on the third day of hospitalization. On postinjury day 4, he was noted to have diffuse ecchymosis of the thigh, buttock, and groin with a tense, fluid collection of the lateral thigh (Figure 1). An unsuccessful attempt was made to reaspirate the hematoma.

Magnetic resonance imaging (MRI) of the left thigh with pre- and post-gadolinium enhancement showed a 16×11×5-cm hematoma in the proximal left thigh at the interface of the subcutaneous fat and underlying vastus lateralis muscle with increased signal on T₁- and T₂-weighted images. No enhancement was seen on postcontrast images (Figure 2). No fracture or muscle tear was present.

Owing to the sizeable fluid collection, pain, and reduced function, we elected to perform a percutaneous irrigation and débridement of the hematoma cavity as described by Tseng and Tornetta.³ Under general anesthesia, the patient was placed supine and 2 small incisions, 1.5 cm in length, were made at the proximal and distal ends of the palpable fluid collection (Figure 3). Approximately 500 mL of blood was aspirated from a well-defined cavity over the vastus lateralis muscle. Cultures of the aspirate were not taken because clinical signs of infection were absent. A Simpulse pressure irrigator (Davol,

Inc., Cranston, RI) was used to irrigate the cavity with 9 L of normal saline. A large-bore drain was taken out through a separate incision. A hip spica Ace wrap dressing was applied to the lower extremity incorporating the pelvis. The patient tolerated the procedure without complication. The drain was connected to wall suction and collected a total

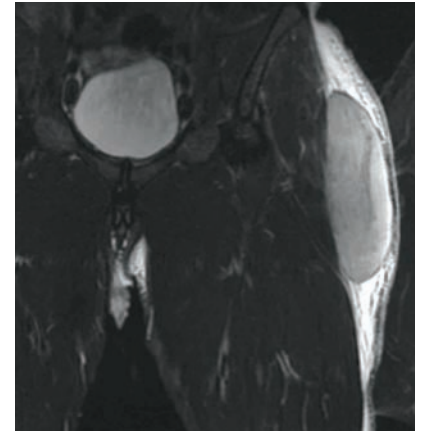


Figure 2. Coronal short tau inversion recovery magnetic resonance imaging of the left thigh demonstrates an extrafascial fluid collection.

of 20 mL of fluid over the next 24 hours. The patient was discharged on postoperative day 1 and allowed to bear weight as tolerated but used crutches for 1 day. Postoperatively, he continued active-assisted range-of-motion exercises with progres-

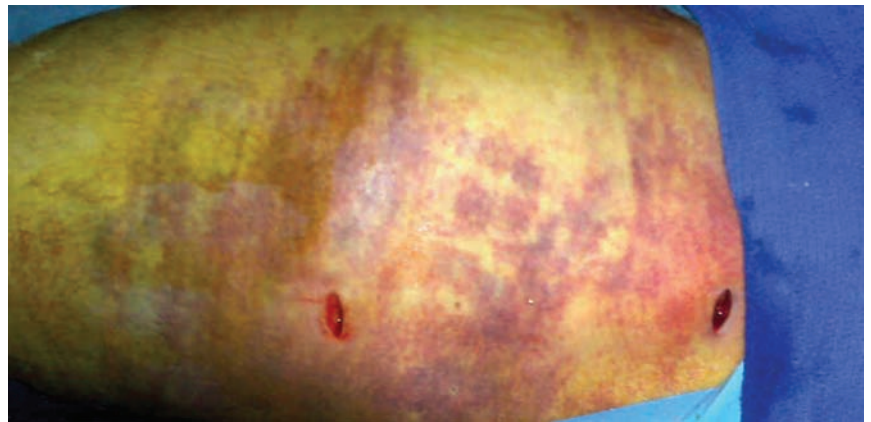


Figure 3. Incisions used for percutaneous débridement of hematoma.



Figure 4. Left thigh 2 weeks postoperatively.

sion to stationary cycling, pool running, and light jogging. Because of the drop in hematocrit with associated orthostatic symptoms, the patient was placed on ferrous gluconate and received a total of 2 units of direct-donor blood 10 days following the injury. The patient continued to progress with football-related activities and was able to return to practice 22 days after the injury (Figure 4). He missed 3 games as a result

was a severe muscle contusion or a degloving injury. MRI demonstrated a contained, extrafascial lesion with hyperintense signal on both T₁- and T₂-weighted sequences, as well as a surrounding hypointense ring on both sequences consistent with a Morel-Lavallée lesion.

The various methods that have been proposed for treatment of Morel-Lavallée lesions include compression, aspiration, injection

tent with a typical Morel-Lavallée lesion in that the resultant tense cavity was filled with blood owing to the traumatic separation of skin and subcutaneous tissue from the underlying fascia. Given the goals of returning the injured athlete back to play as quickly and effectively as possible, open débridement was not a viable treatment option. Two separate attempts to aspirate the lesion were unsuccessful, possibly because

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of the injury and treatment but has returned to full function without any residual deficits.

DISCUSSION

Morel-Lavallée lesion, first described by the French physician Maurice Morel-Lavallée⁴ in 1853, is an uncommon but significant injury to the soft tissues in which the skin and subcutaneous tissue are separated from the underlying fascia. Thus, a potential space that may fill with blood, lymph, and necrotic fat is created. These lesions are usually associated with high-energy injuries that create tangential trauma of the soft tissues, the type of injury more commonly seen in a high-speed motor vehicle collision or a severe crush injury. They are typically found in association with a pelvic or acetabular fracture.⁵

Mellado and Bencardino⁶ reported on the MRI characteristics of Morel-Lavallée lesions. Chronic lesions may appear homogeneously hypointense on T₁-weighted sequences and hyperintense on T₂-weighted sequences. Acute or subacute lesions may appear hyperintense on both sequences. Additionally, these lesions are commonly surrounded by a peripheral, hypointense ring on all pulse sequences.^{6,7} In our case, MRI was obtained to evaluate the extent of the lesion, identify the integrity of the fascia, and delineate whether this

of a sclerosing agent, percutaneous drainage, prolonged surgical drainage, and open débridement.^{3,5,8-10} Treatment of these injuries is generally undertaken to prevent potential bacterial infection and recurrent fluid accumulations. Hak and colleagues⁸ reported on the management of 24 patients who sustained a pelvic or acetabular fracture with an associated Morel-Lavallée lesion. These patients were all treated with open débridement of their lesions. Cultures taken at the time of open débridement were positive in 46% of the cases. No culture was taken in our patient as there was no evidence of clinical infection nor did the aspirated fluid appear purulent.

Tejwani and colleagues¹⁰ reported on 27 cases of Morel-Lavallée lesions of the knee in National Football League players over a 13-year period. The mechanism of injury was a shearing blow from the playing surface in 81% of the cases, and the injury occurred on both natural grass and turf. Fifty-two percent of the injuries resolved with compressive and cryotherapy modalities alone, while 48% also required at least one aspiration. None of the injuries required surgical drainage. These cases differed from ours in that they were filled with serous fluid, likely as an exacerbation of posttraumatic pre-patellar bursitis. Our patient's condition was consis-

a relatively small bore needle or clotted blood was present. Thus, we elected to perform percutaneous drainage of the lesion as described by Tseng and Tornetta.³

One advantage of percutaneous management is preservation of the cutaneous blood supply via the subdermal arterial plexus, as the separation of the subcutaneous tissues from the underlying fascia disrupts the underlying perforating vessels.¹¹ Another advantage to performing percutaneous drainage is that the small incisions are conducive to the expeditious return to sport. The player does not have to wait for a large wound to heal by secondary intention, morbidity is significantly lessened, and the incisions can be placed strategically to avoid any pressure points from overlying pads. We elected to place a continuous suction drain and apply a compressive hip spica dressing to help avoid recurrent accumulation. We believe that expeditious and thorough drainage of this lesion was a safe and effective method of treatment for this athlete. It allowed him to return to pain-free play within 3 weeks after surgery.

Although this is a rare injury, and one more commonly associated with high-energy trauma, the physician treating American football players should be aware of Morel-Lavallée lesion and the treatment options available.

AUTHORS' DISCLOSURE STATEMENT

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

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