MORTEZA KHODAEE, MD, MPH
Department of Family Medicine, University of Colorado School of Medicine, Denver, CO

SETH MATHERN, MD
Department of Family Medicine, University of Colorado School of Medicine, Denver, CO

WENDY S. MADIGOSKY, MD, MSPH
Department of Family Medicine, University of Colorado School of Medicine, Denver, CO

JONATHAN T. BRAVMAN, MD
Department of Orthopedic Surgery, University of Colorado School of Medicine, Denver, CO

A lump on the hip

FIGURE 1. Left lateral hip 2 weeks after a fall.

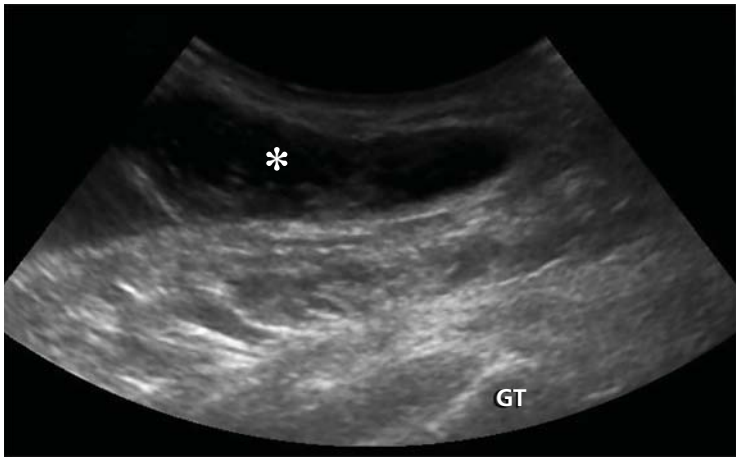

FIGURE 2. Ultrasonography with a curvilinear 2- to 5-MHz probe and a long-axis view revealed a superficial heterogeneous and hypoechoic area (asterisk) at the greater trochanter (GT).

A 42-year-old man presented with a lump on the side of his left hip, which had developed after he fell on his hip while playing basketball about 2 weeks earlier. He was able to continue playing and finished the game. After the game he noticed a lump, which rapidly increased in size. Significant bruising developed afterwards, and the area was mildly painful. The lump did not interfere with his daily activities, but it was annoying.

His medical, surgical, social, and family histories were unremarkable. Physical examination revealed a significant oval-shaped local swelling in the lateral aspect of his left hip with extensive surrounding ecchymosis (**Figure 1**). On palpation the swelling was mildly tender and fluctuant. Range of motion of the hip was normal and did not aggravate his pain.

Ultrasonography to evaluate for fluid collection revealed a subcutaneous heterogeneous and hypoechoic area superficial to the greater trochanter, muscular structure, and the fascia (**Figure 2**). There was no enlargement of the greater trochanter bursa. Aspiration with an 18-gauge needle under ultrasonographic guidance provided no fluid. Based on the clinical presentation and imaging, the diagnosis of Morel-Lavallée lesion was made.

THE DIFFERENTIAL DIAGNOSIS

Traumatic swelling of the lateral hip is an uncommon condition with few possible causes (**Table 1**).[1–5] A comprehensive evaluation beginning with a history and physical examination is essential.

Morel-Lavallée lesion is an uncommon condition resulting from shearing trauma and collection of fluid in the space between deep fatty

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TABLE 1

Differential diagnosis of a traumatic lateral hip lump

Condition	Cause	Diagnostic clues	Management
Hemorrhagic greater trochanter bursitis[2]	Usually from direct trauma; bursa is located deep and is small	Normal hip range of motion; a fluctuating mass over the greater trochanter may be palpable; ultrasonography (US) or magnetic resonance imaging (MRI) necessary for diagnosis	Conservative management often adequate; if bursal enlargement is significant, US-guided aspiration warranted
Greater trochanter fracture[3]	Typically from direct trauma	Patient may or may not be able to bear weight; hip range of motion and resisted abduction often produce pain; greater trochanter tenderness is significant; plain radiography needed for the diagnosis	Referral to an orthopedic surgeon is recommended; operative management required only with significant displacement
Intramuscular gluteus medius hematoma[4]	Usually from direct trauma; may be concurrent with hip fracture	Usually deep and not visible during the physical examination; US or MRI required for definitive diagnosis	Conservative management often adequate; in cases with significant enlarged hematoma, US-guided aspiration warranted
Morel-Lavallée lesion[5]	Usually from shearing trauma	MRI or US helpful for diagnosis	Depending on type and stage of lesion, options may include watchful waiting, compression, aspiration, injection of sclerosing agent, drainage, and incision and evacuation

tissue and superficial fascia.[6] It is usually the result of severe trauma, as in a motor vehicle accident, but it can also result from sports-related trauma, as in our patient.[6–8] Lateral hip, gluteal, and sacral regions are the most common locations for Morel-Lavallée lesions and are often associated with an underlying fracture.[6,9]

Morel-Lavallée lesions usually develop hours or days after trauma, although they may develop weeks or even months later.[2] Symptoms include bulging, pain, and loss of cutaneous sensation over the affected area. Although ultrasonography can be used, magnetic resonance imaging (MRI) is the gold standard for diagnosis and staging.[6,10] If there is concern for fracture, plain radiography should be performed.

Mellado and Bencardino classified Morel-Lavallée lesions into 6 types based on their morphology, presence or absence of a capsule, signal behavior on MRI, and enhancement pattern.[10] The exact rate of infection in patients with Morel-Lavallée lesions is unknown; however, the risk of infection seems to be highest after surgical intervention or aspiration.[5,6]

Another potential complication is fluid reaccumulation, which most often occurs with large lesions (> 50 mL) and lesions with a fibrous capsule or pseudocapsule.[5] Large lesions can compromise adjacent neurovascular structures, particularly in the extremities.[5] Potential consequences include dermal necrosis, compartment syndrome, and tissue necrosis.[5]

Patients with a large lesion, significant pain, or decreased range of motion should be referred to an orthopedic surgeon

MANAGEMENT APPROACH

Aspiration of a fluid-filled mass is useful in both diagnosis and management of Morel-Lavallée lesions. Treatment includes watchful waiting; compression and pressure wraps; injection of a sclerosing agent (eg, doxycyline, alcohol); needle aspiration; percutaneous drainage with debridement, irrigation, and suction; and incision and evacuation.[6]

The approach to treatment depends on the stage of the lesion and whether an underlying fracture is present. Depending on the amount of blood and lymphatic products and the acuity

of the collected fluid (hours to days post-trauma), aspiration with a large-bore needle (eg, 14 to 22 gauge) may or may not be successful.[7] In general, traumatic serosanguinous fluid collections are less painful and resolve faster than well-formed coagulated hematomas.

Patients who have a large lesion, significant pain, or decreased range of motion should be referred to an orthopedic surgeon.

Our patient was managed conservatively, and his symptoms completely resolved in 2 months.

REFERENCES

1. **Ahmad Z, Tibrewal S, Waters G, Nolan J**. Solitary amyloidoma related to THA. Orthopedics 2013; 36:e971–e973.
2. **Harris-Spinks C, Nabhan D, Khodaee M**. Noniatrogenic septic olecranon bursitis: report of two cases and review of the literature. Curr Sports Med Rep 2016; 15:33–37.
3. **Price MD, Busconi BD, McMillan S**. Proximal femur fractures. In: Miller MD, Sanders TG, eds. Presentation, Imaging and Treatment of Common Musculoskeletal Conditions. Philadelphia, PA: Saunders; 2011:365–376.
4. **Stanton MC, Maloney MD, Dehaven KE, Giordano BD**. Acute traumatic tear of gluteus medius and minimus tendons in a patient without antecedant peritrochanteric hip pain. Geriatr Orthop Surg Rehabil 2012; 3:84–88.
5. **Khodaee M, Deu RS, Mathern S, Bravman JT**. Morel-Lavallée lesion in sports. Curr Sports Med Rep 2016; 15:417–422.
6. **Bonilla-Yoon I, Masih S, Patel DB, et al**. The Morel-Lavallée lesion: pathophysiology, clinical presentation, imaging features, and treatment options. Emerg Radiol 2014; 21:35–43.
7. **Khodaee M, Deu RS**. Ankle Morel-Lavallée lesion in a recreational racquetball player. J Sports Med Phys Fitness 2016. Epub ahead of print.
8. **Shmerling A, Bravman JT, Khodaee M**. Morel-Lavallée lesion of the knee in a recreational frisbee player. Case Rep Orthop 2016; 2016:8723489.
9. **Miller J, Daggett J, Ambay R, Payne WG**. Morel-Lavallée lesion. Eplasty 2014; 14:ic12.
10. **Mellado JM, Bencardino JT**. Morel-Lavallée lesion: review with emphasis on MR imaging. Magn Reson Imaging Clin N Am 2005; 13:775–782.

***ADDRESS**: Morteza Khodaee, MD, MPH, Department of Family Medicine, University of Colorado School of Medicine, AFW Clinic, 3055 Roslyn Street, Denver, CO 80238; morteza.khodaee@ucdenver.edu*

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