Morel-Lavallée Lesion

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Morel-Lavallée lesions are posttraumatic soft-tissue closed degloving injuries in which the skin and subcutaneous tissues are separated from the fascia superficial to the underlying musculature.[1] The shear injury disrupts perforating vessels and lymphatics and creates a potential space that fills with blood, serosanguinous fluid, and necrotic fat. Lesions may be missed at initial evaluation and present weeks to months after the inciting event. Hudson and colleagues[2] reported a delay in diagnosis for one third of the patients in their series. Morel-Lavallée lesions may be associated with pelvic and acetabular fractures or may occur with blunt trauma in the absence of fracture. Most commonly, lesions occur within the proximal thigh and trochanteric region.[3] Clinically, Morel-Lavallée lesions usually present as an enlarging painful mass within the anterolateral portion of the affected thigh, with soft-tissue swelling and fluctuance in the region.[1-4] Other reported sites of involvement are the trunk, lumbar, prepatellar, and scapular regions.

Sonographically, Morel-Lavallée lesions are usually hypoechoic and well circumscribed, but their appearance can vary according to stage of internal blood product degradation at time of imaging[5] (Figure 1). The lesion may contain hyperechoic nodules arising from internal fat lobules. Computed tomography of this lesion can show a capsule around the mass and fluid-fluid levels resulting from settling of blood products within the collection.

Magnetic resonance imaging is the preferred imaging modality in the evaluation of Morel-Lavallée lesions. Signal characteristics depend on the internal content and chronicity of the lesions. The lesions are often homogeneously hypointense on T_1-weighted sequences and hyperintense on T_2-weighted sequences and thus may resemble a simple fluid collection (Figure 2). The

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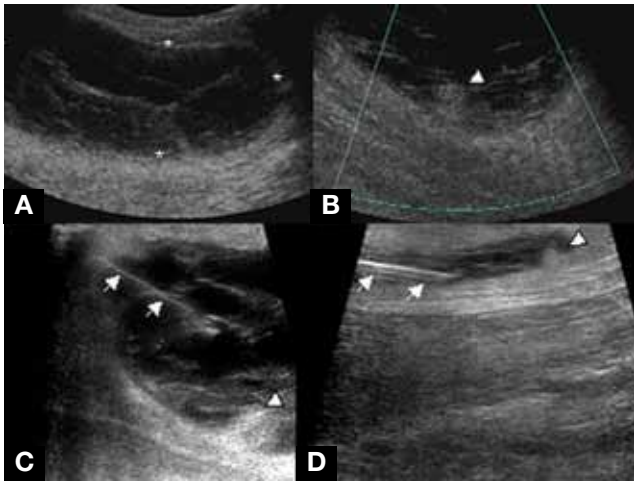

Figure 1. **(A)** Ultrasound of right thigh in a patient with a painful palpable mass after a cycling accident shows large complex septated fluid collection within deep subcutaneous tissues (asterisks), consistent with a Morel-Lavallée lesion. **(B)** Internal vascular flow is lacking, according to color Doppler interrogation. **(C)** Ultrasound-guided aspiration with 20-gauge spinal needle (arrows) yielded 85 cm^3 of serosanguinous fluid. **(D)** Entrapped fat lobules appear as "bright" hyperechoic nodules within lesion (arrowheads) in B and C.

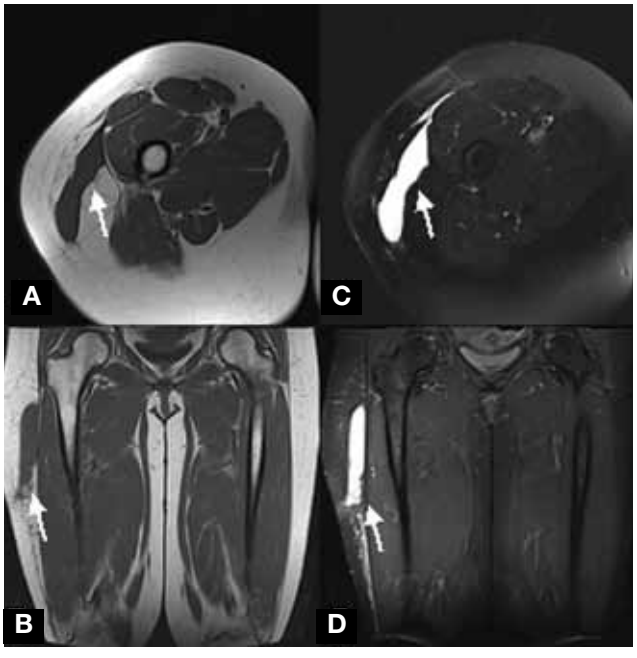

Figure 2. Axial **(A)** and coronal **(B)** T_1-weighted and axial **(C)** and coronal **(D)** T_2-weighted fat-suppressed images show large fluid collection (arrows) within subcutaneous tissues along lateral aspect of right thigh, located within the fascial layers among the iliotibial band, the lateral aspect of the vastus lateralis muscle, and the overlying subcutaneous fat in a "degloving" pattern, reflecting a Morel-Lavallée lesion.

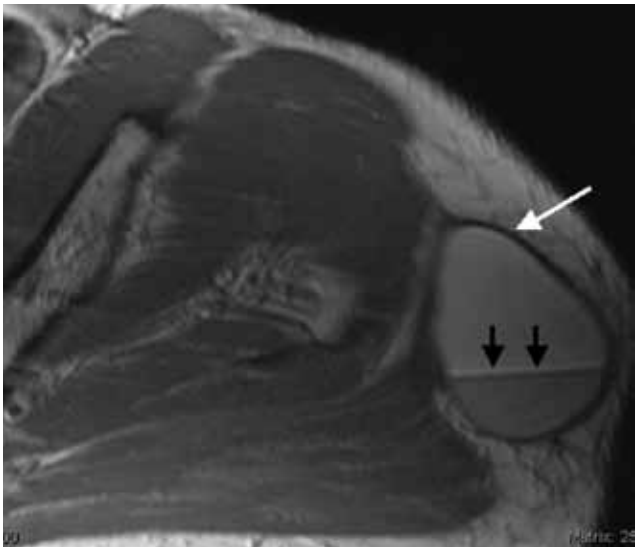

Figure 3. Axial proton density image shows missed Morel-Lavallée lesion with prominent fluid-fluid level (black arrows) and distinct low signal intensity capsule (white arrow).

lesions may also appear homogeneously bright on both T_1- and T_2-weighted sequences, which may reflect a high internal concentration of methemoglobin, a product of hemoglobin degradation. Fat lobules may become entrapped within the lesion, and internal fluid-fluid levels may be present[6] (Figure 3). Variable T_1-weighted signal intensity with heterogeneous T_2-weighted hyperintensity, as well as a hypointense peripheral ring representing hemosiderin and fibrous tissue, may also be apparent (Figure 3). Postcontrast images may show patchy enhancement both internal and peripheral to the lesion, consistent with an organizing hematoma.[6]

The differential diagnosis of the Morel-Lavallée lesion includes other posttraumatic injuries, such as fat necrosis or coagulopathy-related hematoma.[6] As the Morel-Lavallée lesion can clinically and radiographically simulate a malignant tumor, careful evaluation for a prior history of trauma can be very useful in suggesting the correct diagnosis.

Once the lesion is identified, the hematoma should be evacuated and necrotic material débrided, as neglected lesions may become infected.[2,6] There is controversy as to whether drainage in the acute setting should be percutaneous or open.[2,3,7] Morel-Lavallée lesions that are not diagnosed early enough or that are refractory to treatment require open surgery.[3] Presence of a well-defined capsule favors open surgery over conservative therapy.[4]

Authors' Disclosure Statement

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

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