Sacral Morel-Lavallée Lesion: A Not-So-Rare Diagnosis

JONATHAN TRESLEY, JEAN JOSE, EFRAT SARAF-LAVI, EVELYN SKLAR

Department of Diagnostic Radiology, Jackson Memorial Hospital; Miami, FL, USA

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SUMMARY – *Morel-Lavallée lesions are closed soft tissue degloving injuries with a propensity to become infected, arising in the lumbosacral region or even the scalp, common anatomical locations in neuroradiological studies. The radiologist must recognize this entity, its traumatic etiology, and treatment options. Our patient's Morel-Lavallée lesion was evaluated with ultrasound and MRI, demonstrating a predominantly hemorrhagic lesion successfully managed by aspiration.*

Introduction

A Morel-Lavallée lesion is a closed soft tissue degloving injury that commonly occurs after a shearing trauma. Common sites include the soft tissues overlying bony protuberances, such as the patella, greater trochanter, and sacral region. The skin and subcutaneous tissues are separated from the underlying fascia and the new space is filled by serous fluid, liquefied blood, and necrotic tissue¹⁻³. Up to half of Morel-Lavallée lesions may become infected⁴. While Morel-Lavallée lesions are common findings in the orthopedic realm, little has been published in the neuroradiology literature regarding such a common finding. We describe a patient whose clinical history was classic for the Morel-Lavallée lesion but whose imaging findings indicated a greater degree of hemorrhage than the prototypical Morel-Lavallée lesion.

Materials and Methods

Our patient is a 53-year-old man with primary progressive multiple sclerosis with predominant gait ataxia and a body mass index of 34.3 who fell in the shower onto his lower back. He noticed a soft tissue mass which would not resolve. He had no history of anticoagulation therapy or bleeding diathesis. The patient underwent contrast-enhanced MRI of the lumbosacral spine which revealed a large sacral

Morel-Lavallée lesion. Due to persistent discomfort, the patient elected ultrasound-guided aspiration of the lesion with subsequent significant improvement of his discomfort.

Results

On physical examination, a large fluctuant soft tissue mass was noted without skin breakdown, warmth, or erythema. On MRI, within the subcutaneous tissues posterior to the sacrum, there was a circumscribed, predominantly cystic structure measuring 12.5 cm in the craniocaudal (CC) dimension by 5.8 cm in the anterior-posterior (AP) dimension by 18.7 cm in the transverse (TRV) dimension. The structure was nonenhancing and had high signal intensity on T1 and T2-weighted imaging. It contained nonenhancing low signal intensity septations and a nonenhancing posterior component measuring 6.8 cm (CC) by 1.4 cm (AP) by 13.6 cm (TRV) which was heterogeneously isointense on T1 and T2-weighted imaging. There was a low signal intensity capsule surrounding the lesion. No invasion of the deep fascia was appreciated, and there were no fractures. A small amount of soft tissue edema was noted at the inferior margin. Incidentally noted were a synovial cyst at the L4-L5 facet and bursitis at the L4-L5 spinous process. Approximately two weeks later, the patient underwent ultrasound-guided aspiration of the structure.

Figure 1 A) T1. B) T2. C) T1 post contrast. D) T1 post contrast with fat saturation. E) Short tau inversion recovery (STIR). F) Diffusion weighted imaging (DWI). G) Apparent diffusion coefficient (ADC) sagittal sequences of the lower lumbar spine and sacrum demonstrated the hemorrhagic septated lesion with layering non-enhancing components and a low signal intensity capsule posterior to the sacrum. Incidentally noted were a synovial cyst at L4-L5 and bursitis at the L4-L5 spinous process.

Multiple septae without internal vascularity were identified; 650 ml of hemorrhagic fluid were aspirated and sent for laboratory analysis which revealed 55,342 red blood cells per cubic centimeter, and 2,771 nucleated cells per cubic centimeter including 6% neutrophils, 90% lymphocytes, and 4% monocytes. Cultures were negative for aerobic and anaerobic bacteria, yeast, and acid-fast organisms. At the most recent follow-up approximately three weeks after

↑ Figure 3 Large field of view sonographic image demonstrated the large septated lesion within the deep soft tissues posterior to the sacrum.

← Figure 2 Axial T2 weighted sequence of the lower lumbar spine and sacrum demonstrated the extent of the Morel-Lavallée lesion and a dependent heterogeneous component corresponding to organizing hematoma.

the aspiration, the patient's pain was nearly resolved and the mass had not reaccumulated by physical examination.

Discussion

Morel-Lavallée lesions commonly develop in regions overlying bony prominences, including the soft tissue superficial to the greater tro-

chanter, patella, scapula, posterior skull, and sacrum². The lesions are typically low signal intensity on T1-weighted images and high signal intensity on T2-weighted images, often being confused for a cyst. Occasionally, the lesion will demonstrate T1 shortening due to blood components, and the characteristics will vary according to the degree of degradation of blood products^{2,3}. Fluid-fluid levels may be identified, and there may be patchy enhancement from formation of an organizing hematoma that may be mistaken for neoplasm^{1,2,5}. On ultrasound, there may be hyperechoic nodules from fat lobules which may also be mistaken for neoplasm². Our patient sustained a Morel-Lavallée lesion that was strikingly high signal on T1-weighted images, confirmed at aspiration to be hemorrhagic.

Morel-Lavallée lesions may initially be overlooked after trauma due to diffuse swelling^{1,4,6}. However, it is very important to recognize these lesions as up to 50% may become infected^{4,7,8}. In cases of infected Morel-Lavallée lesions, there is a risk of osteomyelitis of the adjacent bone, particularly if there is an underlying fracture

^{2,4,6}. Treatment should be guided by the clinical suspicion of active or imminent infection due to the degree of necrotic tissue, as neglected necrotic tissue may become infected^{2,8}. If identified early, Morel-Lavallée lesions may be amenable to percutaneous drainage and lavage with a decreased risk of infection^{1,8}. Our patient was successfully treated by aspiration, however it is commonly believed that lesions that have already developed a low signal intensity capsule may require open surgical debridement^{2,4,8-10}.

Conclusion

Morel-Lavallée lesions are closed soft tissue degloving injuries that result from a shearing trauma over bony protuberances, most commonly the patella, greater trochanter, and sacrum. It is important to recognize this entity and its traumatic etiology as well as its propensity to become infected in order to guide treatment, which often requires percutaneous drainage or open debridement.

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Jonathan Tresley, MD
Department of Diagnostic Radiology
West Wing 279
Jackson Memorial Hospital
1611 NW 12th Ave
Miami, FL 33136, USA
Tel: (305) 585-7500
Fax: (305) 585-5743
E-mail: jtresley@med.miami.edu