Morel-Lavallée lesion of the elbow with ultrasound and MRI correlation

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Morel-Lavallée lesions are hemolymphatic, nonanatomic fluid collections that result from a separation of the subcutaneous tissue from the underlying fascia. Ultrasound and MRI characteristics of such lesions have been previously described and can be helpful in establishing a diagnosis and guiding clinical management. We present a case of a Morel-Lavallée lesion of the elbow, with ultrasound and MRI correlation, which has not been reported in the radiology literature heretofore.

Introduction

Morel-Lavallée lesions (MLL), first described in 1853, are closed degloving injuries that result in an abrupt separation of the subcutaneous tissue from the underlying fascia (1). The vessels and lymphatics that penetrate through this fascial layer are disrupted, and as a result, hemolymphatic fluid and debris accumulate in this potential space. These traumatic injuries are well known to orthopedic surgeons, and their imaging features have been described in radiology literature over the past two decades (2-6). MLLs are most commonly seen in the trochanteric region of the hip and around the proximal thigh, but they have also been reported in the knee, trunk, lower lumbar region, and calf. We present a case of a MLL of the elbow in an adult, with MRI and ultrasound correlation in the acute phase, which to our knowledge has not been previously reported in radiology literature.

Case report

A 57-year-old male presented to the Emergency Department with right elbow swelling and discomfort. The patient reported falling on the elbow and skidding on the grass with the elbow flexed forward while playing football, four days before presentation. While in the Emergency Department, the patient was seen by Orthopedics, had elbow radiographs performed (Fig. 1), and had approxi-
mately 5 cc of fluid (described as "venous blood") aspirated from the area of swelling.

The patient presented for a followup appointment at the Orthopedic Clinic two days later complaining of pain and increased swelling at the medial aspect of the elbow. The pain woke him from sleep and was only minimally relieved with pain medication. Additionally, there were two palpable cords in the region of elbow swelling. The patient was clinically diagnosed with traumatic bursitis, and a compressive bandage was applied. Over the next week, the patient’s swelling worsened, and he had an ultrasound examination of the area of pain and palpable mass (Fig. 2).

On ultrasound, the mass showed lobules of increased echogenicity, interspersed with areas of slightly complex lower echogenicity. Unenhanced MRI, performed the following week, demonstrated an irregularly shaped, 4.2 x 3.7 x 1.4-cm (longitudinal x AP x transverse) lentiform unilocular T2 hyperintense collection that contained numerous fat globules overlying the deep fascia of the elbow and draping over the medial epicondyle (Figs. 3, 4).

The imaging findings were consistent with an acute MLL. The patient continued to follow up with Orthopedics over the course of the next few months, opting for conserva-

Figure 2. A. Targeted ultrasound evaluation of the soft palpable mass located over medial epicondyle (asterisk) with a high-frequency linear transducer (12 to 5-MHz transducer) demonstrates a complex collection (arrowheads) located between the subcutaneous fat and fascia. The lesion contains highly echogenic lobules of fat, interspersed with areas of lower echogenicity. B. Color Doppler imaging of the Morel-Lavallée lesion demonstrates minimal flow in two small vessels (arrows) traversing the collection, and absence of flow in the lesion otherwise.

Discussion

MLLs are the result of closed degloving injuries that cause the skin and subcutaneous tissues to separate from the underlying fascial layer. Patients often present with a history of trauma (with a blunt tangential force shearing the hypodermis from the fascia), as seen in motor vehicle accidents associated with pelvic or acetabular fractures, or often after a skid or a fall (1, 7, 8), as with our patient. On physical exam, there is a fluctuant, tender mass in the area of injury. It is important to note, however, that the trau-
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Figure 4. Coronal T1W(TR/TE 633/19) (A) and PD fat-saturated (TR/TE 2833/32) (B) sequences. Morel-Lavallée lesion is seen superficial to the fascia (black arrow), overlying the medial epicondyle. A tubular structure (white arrow) surrounded by fat is also seen coursing through the collection, representing sheared-off subcutaneous venous branch.
on physical exam. The medial location of the lesion distinguishes it from a post-traumatic olecranon bursitis. Also, as discussed by Borrero et al (5), bursitis should resolve once the causative stress is removed. In our case, there was persistent swelling and tenderness over the course of 6 months, despite conservative therapy. Similarly, the recalcitrant course of this lesion argues against a hematoma. The lesion was aspirated and re-accumulated shortly thereafter, whereas the natural time course for hematomas in a patient without coagulopathy would be to reabsorb gradually.

In conclusion, this is, to our knowledge, the first reported case of an acute Morel-Lavallée lesion of the elbow with ultrasound and MRI correlation. The ultrasound and MRI demonstrated typical findings of an acute MLL, and in conjunction with the mechanism of injury and clinical course of the lesion, helped establish the diagnosis and direct patient management.

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