

Morel-Lavallee Lesion: Case Report with Review of Literature

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ABSTRACT

Morel-Lavallee lesions are closed degloving soft tissue injuries which occur because of trauma and in which the skin and subcutaneous tissue are separated from superficial fascia. This shear trauma results in creation of a potential space filled with serosanguinous fluid, blood and necrotic fat. We discuss a case of 52-year-old female with history of trauma one week back, who presented with a boggy swelling over the postero-lateral aspect of proximal forearm and distal arm. Local examination showed fluctuating fluid collection. MRI showed variable intensity fluid collection in a potential space between the subcutaneous tissue and deep fascia in arm and forearm. Percutaneous decompression and evacuation of the collection with systemic antibiotic therapy resulted in rapid improvement.

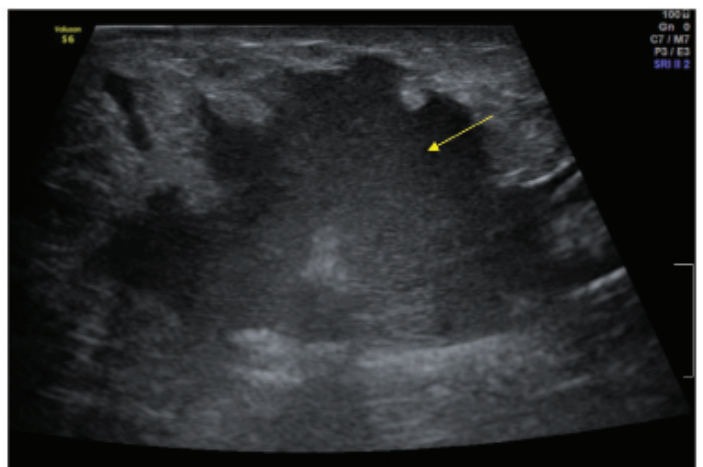
Keywords: Closed gloving injury, Haemolympathic fluid, Mellado and Bencardino classification, Morel-Lavallee extravasation, Percutaneous drainage

CASE REPORT

A 52-year-old female presented to the radiology department with swelling over the posterolateral aspect of upper portion of left forearm and arm region with nagging pain over the swelling. She gave history of injury one week prior to her current visit. Swelling appeared about two days after the injury and was gradually increasing over time. Clinical examination revealed a fluctuant, tender and boggy swelling over the posterolateral aspect of upper part of forearm and distal arm. Laboratory evaluation showed elevated leucocyte count and ESR. Plain radiograph revealed well defined soft tissue swelling on the posterolateral aspect of upper part of forearm and lateral aspect of arm [Table/Fig-1,2]. Ultrasonography was done which revealed a hypoechoic collection with floating internal echoes in the posterolateral aspect of arm between the subcutaneous plane and deep fascia. Few fat lobules were also noted within the collection [Table/Fig-3,4]. Similar anechoic collection noted in proximal aspect of left lateral forearm between the subcutaneous plane and deep fascia [Table/Fig-4a,b]. On MRI, the collection at lateral aspect of arm was hyperintense on T2WI/STIR and hypointense on T1WI in the nondependent region with hyperintensity on T1 and T2 in dependent region with demonstration of fluid levels [Table/Fig-5a,b]. The lesion in the arm measured 5.6 cm (Anteroposterior) x 2.7 cm (Transverse) x 3.2 cm (Craniocaudal). Few fat lobules were noted within this collection [Table/Fig-6a,b]. A well defined cystic collection was noted over the posterolateral aspect of forearm which is hyperintense on T2WI/STIR and hypointense on T1WI [Table/Fig-7,8]. The lesion in forearm measured 9 cm (craniocaudal) x 1.2 cm (transverse) x 0.6 cm (anteroposterior). Both the collections were located deep to the subcutaneous plane, superficial to the muscular compartment. The lesions were hypointense on T1WI and were hyperintense in T2WI and STIR [Table/Fig-8]. Visualized muscles and rest of the soft tissue were normal. Left elbow joint was normal. Based on the history, clinical features and MRI characteristics the diagnosis of Morel-Lavallee lesion was made. Differential diagnosis include haemangioma, fat necrosis and subcutaneous haematoma. Since the lesion was unencapsulated, percutaneous decompression and evacuation of the collection was performed. There was complete resolution of the swelling clinically. Follow up showed complete resolution of collection but images are not available.



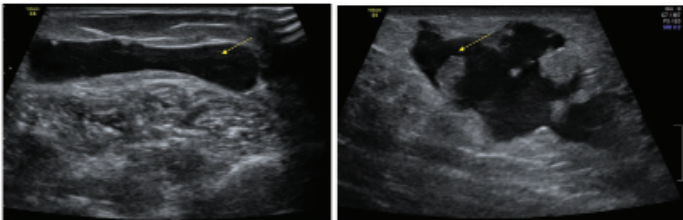
[Table/Fig-1]: X-Ray forearm AP and lateral shows soft tissue swelling in posterolateral aspect of forearm. No bony injury noted. **[Table/Fig-2]:** X-Ray arm lateral and AP shows a soft tissue density swelling noted in the posterolateral aspect of arm (arrows). (images left to right)



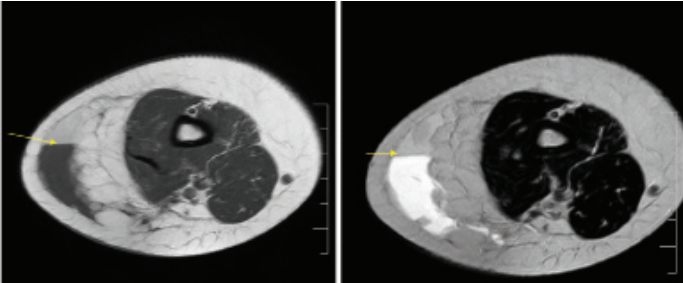
[Table/Fig-3]: US image shows hypoechoic collection in arm with floating internal echoes and hyperechoic fat lobules (arrows).

DISCUSSION

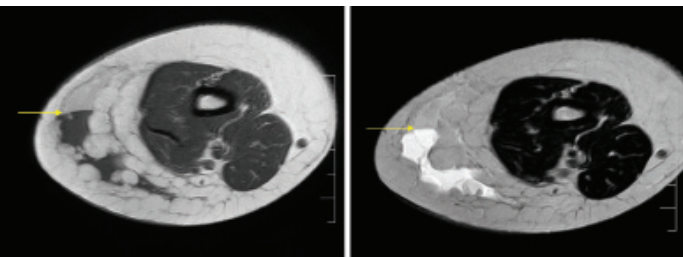
A Morel-Lavallee lesion is a closed degloving injury after trauma first described by Victor Auguste Francois Morel-Lavallee. They occur



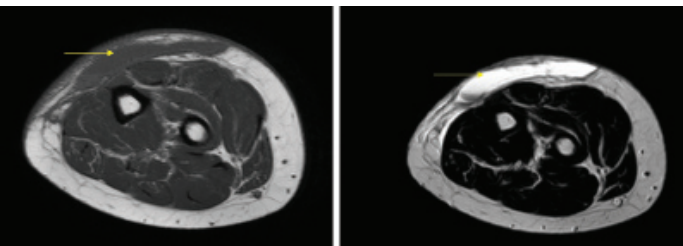
[Table/Fig-4]: a) US image shows anechoic collection between subcutaneous tissue and deep fascia in forearm (arrows); b) US image shows few fat lobules within the anechoic collection (arrows).



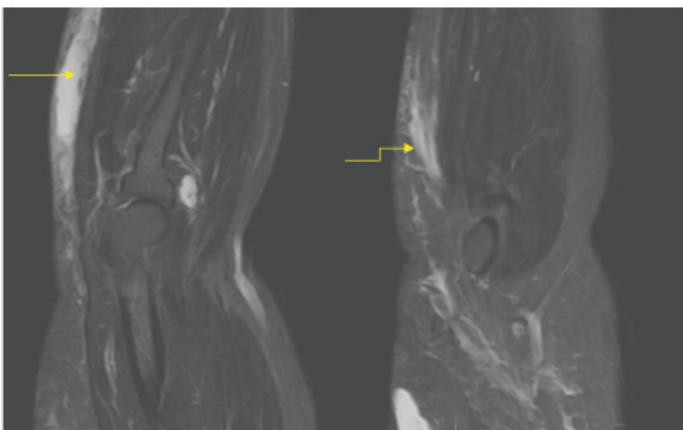
[Table/Fig-5]: a) MRI T1WI axial section shows hypointense fluid levels in posterolateral aspect of arm between the subcutaneous tissue and deep fascia of arm (arrows); b) MRI T2WI shows fluid levels in posterolateral aspect of arm between the subcutaneous tissue and deep fascia of arm (arrows).



[Table/Fig-6]: a) MRI T1WI shows fluid levels and fat lobules in posterolateral aspect of arm between the subcutaneous tissue and deep fascia of arm (arrows); b) MRI T2WI shows fluid levels and fat lobules in posterolateral aspect of arm between the subcutaneous tissue and deep fascia of arm (arrows).



[Table/Fig-7]: a) MRI T1WI shows hypointense collection between the subcutaneous tissue and deep fascia of forearm; b) MRI T2WI shows hyperintense collection between the subcutaneous tissue and deep fascia of forearm.



[Table/Fig-8a,b]: Short tau inversion recovery hyperintensity noted in the antecubital fossa suggestive of soft tissue oedema.

most often unilateral and more predominantly seen in women than in men [1]. They result in creation of a potential space that fills with serosanguinous fluid, blood and necrotic fat. They usually present

within hours to days after initial trauma, but few patients might take months to years after initial trauma [2]. They commonly occur over bony prominences most commonly over greater trochanter of femur, lumbar spine, scapula, knee and elbow. Morel-Lavallee is used as a term to describe degloving type of injuries irrespective of the location though it was initially described for lesions over the greater trochanter. Plain radiographs are not very useful which might show a well defined non calcified soft tissue mass. On ultrasound they appear as well defined fluid collection between subcutaneous tissue and deep fascia. Fluid collection may be anechoic or hypoechoic depending on the content. Hyperechoic areas within the collection represent fat. Fluid-fluid levels are noted in CT due to blood and lymphatic fluid sedimentation and varying amount of debris within the lesion including fat lobules with or without peripheral capsule. MRI is the best modality of diagnosing and evaluating Morel-Lavallee lesion. They are seen as well defined lesions with tapering margins that are continuous with adjacent fascial planes. They have a variable appearance depending on concentration of haemolymphatic fluid. They may or may not have a capsule depending on the duration of lesion. Capsules are seen as hypointense lining on all pulse sequences due to their fibrous nature [3]. Lesions might show no enhancement, peripheral, septal or internal enhancement. MRI signal intensity varies according to the duration of the lesion and might show spectrum of signal changes [4,5]. Long-standing Morel-Lavallee lesions present with signal characteristics of clear fluid. This lesion is classically due to hemolympathic fluid and is referred to as seroma that appears hypointense on T1W1 and hyperintense on T2W1 sequences and the peripheral capsule appears hypointense on both T1W1 and T2W1. They appear as fluid intensity lesions which are hypointense on T1 weighted sequences and hyperintense on T2 weighted sequences that represent a serosanguinous fluid or seroma. The surrounding capsule appears hypointense on all sequences. In acute lesions the space between the subcutaneous fat and the underlying deep fascia is filled up with blood or lymph. Later it is replaced by serosanguinous fluid lined with fibrous capsule. In case of subacute haematomas Morel-Lavallee lesions show hyperintensity on both T1 and T2 weighted sequences due to the presence of methemoglobin [2,3].

Mellado Becardino proposed an MRI classification system for Morel-Lavallee lesions [6]. Six types have been described based on lesion shape, signal and enhancement characteristics.

Type I lesions were laminar shaped fluid intensity lesions with decreased T1 and increased T2 signal. They occasionally had a capsule which did not enhance.

Type II lesions were oval shaped with increased T1 and T2 signal and looked like a subacute haematoma. They had a thick capsule with variable enhancement.

Type III lesions were oval shaped with intermediate T1 and heterogeneous T2 signal and had the appearance of a chronic organizing haematoma. They had a thick capsule with internal/peripheral enhancement.

Type IV lesions were linear shaped with hypointense T1 signal and hyperintense T2 signal and looked like a closed laceration. These lesions had no capsule and variable enhancement.

Type V lesions were round in shape with a variable T1 and T2 signal described as pseudonodular, they may have a thin or thick capsule and had internal/peripheral enhancement.

Type VI were considered infected with variable T1 and T2 signal and had variable sinus tract formation, a thick capsule and internal/peripheral enhancement.

Our case comes under type I of Mellado and Becardino MRI classification.

Mellado JM et al., gave an account of five patients with long standing Morel Lavallee lesions of duration ranging from three months to 34 years and all the cases described are related to the lower limb, but

in our case Morel Lavallee lesion was noted in upper limb and with a shorter duration [3].

Compared to the case report by Bruce CG et al., where the Morel Lavallee lesion was noted in the thigh and was categorised as type II under Mellado and Bencardino MRI classification, our case has lesions in both fore arm and arm and were classified under type I Mellado and Bencardino MRI classification [3,7].

Anirudh VN et al., have given a detailed case report of Morel Lavallee lesion in the thigh with imaging findings on USG, CT and MRI along with treatment. Our case has imaging findings on X-Ray, USG and MRI with the lesion in the forearm and arm [8].

Kontis E et al., have mentioned of a Morel Lavallee lesion with no history of trauma or overuse of a part on the lateral aspect of thigh. Our case has the lesion secondary to trauma [9]. Differential diagnosis includes haemangioma, fat necrosis and subcutaneous haematoma. Both medical management and surgical management are done for this condition. Based on imaging if we find the capsule it helps in better treatment as presence of capsule indicates surgical management else incidence of recurrence is high with conservative management.

CONCLUSION

Morel-lavallee lesion which occurs due to closed degloving injury is a well known entity to orthopaedicians but not commonly encountered by radiologists. History of trauma with fluctuating swelling over the

bony prominence and typical MRI findings will make the diagnosis straight forward. Imaging plays an important role in evaluating the extent and more importantly presence of peripheral capsule as management is based on this. If there is presence of capsule then surgical management must be preferred than medical management as recurrence is high with medical management. Missed diagnosis can lead to contour deformity as a result of local tissue necrosis.

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