

## Case Report

# An unusual presentation of morel- lavallee lesion in the arm: a case report

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### ABSTRACT

Morel-lavallee lesions (MLL) are post traumatic closed internal de-gloving injury with abrupt separation of skin and subcutaneous tissue from the underlying fascia. The shearing force damages the blood vessels and lymphatics, resulting in collection of the serosanguinous fluid and necrotized fat. Early diagnosis and management minimize complications like infections or extensive skin necrosis. MLLs commonly described in pelvic and lower extremity trauma, and there are limited reports in other locations. A 28-year-old male presented with pain and swelling over the left elbow for 6 days with multiple deep bruises over the skin extending from mid arm to proximal forearm. Ultrasound of the arm revealed a large encapsulated collection consistent with MLL. An open debridement with excision of all necrotic skin and necrotic tissue was performed followed by skin grafting. Intra-operative cultures were negative and pathology was consistent with MLL. Morel-lavallee lesions should always be considered as early diagnosis of previous trauma regardless the location. The key to recognize this injury depends on suspicious mechanism involving significant shear forces. Aggressive surgical debridement remains the key to prevent significant morbidity and mortality.

**Keywords:** Morel-Lavallee, Arm, Renal tubular acidosis, Internal de-gloving, Soft tissue mass, Debridement

### INTRODUCTION

Morel-Lavallee lesions (MLL) are rare soft tissue injuries with inter-fascial disruption between subcutaneous soft tissue and muscle.<sup>1</sup> The most common mechanism is severe trauma following road traffic accident (RTA)/run-over injuries. The greater trochanter or hip, thigh, pelvis, calf and abdomen were common sites. The mechanism of injury is usually trauma that occurs tangential to fascial planes, resulting in a shear force.<sup>2</sup> The space created becomes filled with blood, lymph or necrotic fatty tissue, leads to severe inflammatory and infectious processes.<sup>3</sup> Early diagnosis and management reduce the morbidity associated with infections and extensive skin necrosis. Here, we present a case of Morel-lavallee lesion in the arm, an unusual site of presentation in a young male following RTA and its management.

### CASE REPORT

A 32-year-old male presented with pain and swelling in the left elbow for 6 days duration following RTA in which the vehicle run over his arm. The patient was managed initially with analgesics and anti-inflammatory elsewhere. Since, the swelling and pain around elbow is progressing, he came to the outpatient department. Diffuse boggy swelling with multiple deep bruises over the skin extending from mid arm to proximal forearm (Figure 1). Warmth and tender elbow joint with mild stiffness and no signs of compartment syndrome. Plain X-ray of the left elbow showed shadows of soft tissue disruption and no evidence of fracture. He was managed conservatively with anti-inflammatory and limb elevation.

Within 48 hours of observation, the patient developed skin blackening over the lateral and posterior aspect of elbow with associated fever and increased pain. His CRP and ESR were elevated. On inspection, the black discoloration was extending circumferentially from the mid-upper arm to proximal forearm. There was notable fluid collection, most prominently in the posterior aspect of arm underneath the area of greatest skin necrosis. The compartments were flaccid and compressible with intact neurovascular function. Ultrasound of the arm revealed an extensive fluid collection in the subcutaneous plane extending from the mid-arm to the proximal forearm, consistent with an internal degloving injury (Morel-lavallee lesions).



**Figure 1: Diffuse boggy swelling with multiple deep bruises over the skin extending from mid arm to proximal forearm with necrosis.**

Since the symptoms continued to worsen and he was taken for emergency debridement, there was clear demarcation of necrotic skin with subcutaneous tissues and deep structures (Figure 2). Complete resection of the circumferential necrotic skin and subcutaneous tissue over the left arm was done till appearance of fresh blood (Figure 3). Culture sent from sero-sanguinous fluid was found to be sterile. Due to the extensive debridement and wide raw area, he was put on vacuum assisted closure (VAC) therapy for two weeks and later skin graft was done. He was started on both active and passive mobilization of elbow after two weeks of skin grafting. At 6 months, he gained slowly full range of movement and at the end of 2 years follow up; he was doing all functional activities.



**Figure 2: Drainage of haemorrhagic fluid demonstrating skin with subcutaneous and deep tissues separation.**



**Figure 3: Radical debridement of all necrotizing skin and soft tissues with fresh bleed.**

## DISCUSSION

Morel lavallee lesion (MLL) or closed degloving injuries were associated with high morbidity and delayed recovery due to infection.<sup>4</sup> This lesion was first described by Maurice Morel-Lavallee in 1853.<sup>5</sup> Arm and elbow were one the rare site for MLL to occur. These injuries occur due to sudden high-intensity forces resulting in compression, stretching, or friction of the soft tissue structures. Such forces cause detachment of subcutaneous tissue from muscle fascia, thereby injuring the vessels that pass through these layers.<sup>6</sup> The lymphatic / blood vessels between the layers were disrupted which results in accumulation of blood/lymphatic fluid with subcutaneous debris in the potential space. The result was formation of a fibrous pseudo-capsule, prevention of fluid reabsorption and predisposition toward bacterial colonization and infection that can compromise blood supply to the overlying skin and cause necrosis.

In majority, the diagnosis of Morel Lavallee lesion was made initially thinking of the site of involvement and mechanism of injury. In our patient, due to unusual site of involvement (left arm), he was managed initially with immobilization and analgesics. But on serial evaluation of the skin condition and ongoing necrosis with increasing subcutaneous fluid collection, he was diagnosed to have MLL. The ultrasound demarcates clearly the fluid collection in subcutaneous layer confirming the same later by surgical debridement.

Morel-Lavallee lesion can often be confirmed via several imaging modalities, including ultrasound, computed tomography (CT), magnetic resonance imaging (MRI). MRI is the investigation of choice to classify different types of MLL.<sup>7</sup> Morel-Lavallee lesion often appears as a hypointense T1-sequence and hyperintense T2-sequence similar to most other fluid collections. There may be variable T1- and T2-intensities with subcutaneous tissues in the fluid collection. Mellado and Bencardino classified six types of MLL based on the shape of lesion, signal characteristics, enhancement, and the presence or absence

of a capsule based on the MRI study. They applied their classification system and proposed the management of MLL accordingly.<sup>8</sup> In our patient we had done only ultrasound as the patient not affordable for any higher imaging modalities.

The treatment depends on the stage at which the lesion is detected. Management options include compression banding, aspiration, or incision and evacuation with or without injection of sclerosing agents.<sup>9</sup> For acute lesions with closed or no underlying fracture, conservative treatment with compression banding could first be attempted and with percutaneous drainage if no resolution.<sup>10</sup> Persistent lesions may require surgical debridement and primary/secondary closure.

Our patient underwent extensive drainage and radical debridement followed with vacuum assisted closure (VAC) therapy for two weeks. After 2 weeks of VAC, the tissues very healthy and hence skin grafting was done. At 6 months, he gained slowly full range of movement and at the end of 2 years follow up; he was doing all functional activities.

## CONCLUSION

Morel-Lavallee lesions should always be considered as early diagnosis of previous trauma regardless the location. The key to recognize this injury depends on suspicious mechanism involving significant shear forces. Aggressive surgical debridement remains the key to prevent significant morbidity and mortality.

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