

# A peculiar case of Morel-Lavelle lesion of upper limb

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### SUMMARY

Morel-Lavallee lesions (MLL) are post-traumatic, closed internal degloving injuries that can result in severe complications if not diagnosed early. It is conventionally seen in cases of the high energy injuries of the pelvis and lower limb. The accumulation of extravasated blood, secondary to fracture and soft tissue damage may cause internal degloving injury, skin necrosis, soft tissue damage and acute osteomyelitis. We report here the clinical and radiological features in a 32-year-old male referred from the emergency department of a tertiary hospital who had sustained high energy motor vehicle accident. On examination, there was a fluctuant, mobile, non-tender subcutaneous mass over the distal arm with suspicion of internal degloving injury. Plain radiographs showed no fractures. Ultrasound showed a fluid collection with the presence of septations and echogenic debris within the collection. Extravasation was noted between subcutaneous tissue layer and fascia at the posterolateral aspect of the arm. Wound debridement under general anaesthesia was carried out. Intraoperative findings reported a significant amount of thick serous fluid with necrotic debris. Unhealthy skin and fat layers were debrided. Underlying muscles were found to be healthy. The results of the intraoperative fluid culture and sensitivity showed no growth. Negative pressure vacuum dressing was carried out. After five cycles of vacuum dressing, the wound showed signs of healing with an improved range of motion of the elbow. Orthopaedic surgeons need to be vigilant of the possibility of MLL in the upper limb as a differential diagnosis in the management of high energy trauma.

### INTRODUCTION

Morel-Lavallee lesions (MLL) are caused by the shearing of the subcutaneous tissues from the underlying muscular fascia resulting in the accumulation of necrotic fat and blood. The clinical presentation depends on the contents and time since the trauma.<sup>1</sup> MLL in the lower limb is well reported, however in the upper limb this is rarely reported and has a low awareness amongst practitioners as it is frequently misdiagnosed.<sup>2</sup> Early diagnosis and management of the lesion are essential to prevent complications like infections or extensive skin necrosis.<sup>3</sup>

### CASE REPORT

A 32-year-old male presented to the emergency department (ED) after a high energy motor vehicle accident. He sustained

an abrasion wound measuring 1cm x 1cm over the distal arm with bruises up to proximal arm (Figure 1A and 1B). Wound irrigation and suturing were administered. The patient was referred to the orthopaedic team for further evaluation and treatment. On examination, there was a fluctuant, mobile, non-tender subcutaneous mass over the distal arm with suspicion of internal degloving injury. Plain radiographs showed no fractures, including that of the humerus. Further imaging with ultrasound showed fluid collection measuring 26cm (length) x 2cm (depth) with the presence of septations and echogenic debris within the collection (Figure 2). Extravasation was noted between subcutaneous tissue layer and fascia at the posterolateral aspect of the arm. The patient was observed overnight to rule out acute compartment syndrome. The patient showed clinical signs of worsening sepsis with lower blood pressure and tachycardia. The discolorations and ecchymosis of the wound had worsened and required the need for radical wound debridement under general anaesthesia.

Intraoperative findings noted a significant amount of thick serous fluid with necrotic debris. Unhealthy skin and fat layers were debrided. Underlying muscles were found to be healthy. A negative pressure drain was placed exiting superior to the operation site and therefore avoiding the neurovascular bundle, and compressive dressing was applied. Based on the history of the patient, examination, and radiographic findings, a diagnosis of MLL was made. The results of the intraoperative fluid culture and sensitivity showed no growth. Negative pressure vacuum dressing was carried out. After five cycles of vacuum dressing, the wound showed signs of healing with an improved range of motion of elbow (30° to 110°) (Figure 1C and 1D). The patient was discharged from the ward on Day-29 of admission. He was requested to return for a follow up after three months. The wound was left to heal by secondary intention using Bactigrass® soft paraffin dressing every other day.

### DISCUSSION

MLL was first described in the 1850s by a French physician named Maurice Morel-Lavallee. It is an internal degloving wound wherein the skin and subcutaneous tissue have been forcibly separated from the underlying fascia as a result of shear stress.<sup>3</sup> The lymphatic and blood vessels between the layers are disrupted, resulting in the accumulation of blood and lymphatic fluid as well as subcutaneous debris in this potential space and excess accumulation over time can compromise the blood supply to underlying skin and lead to

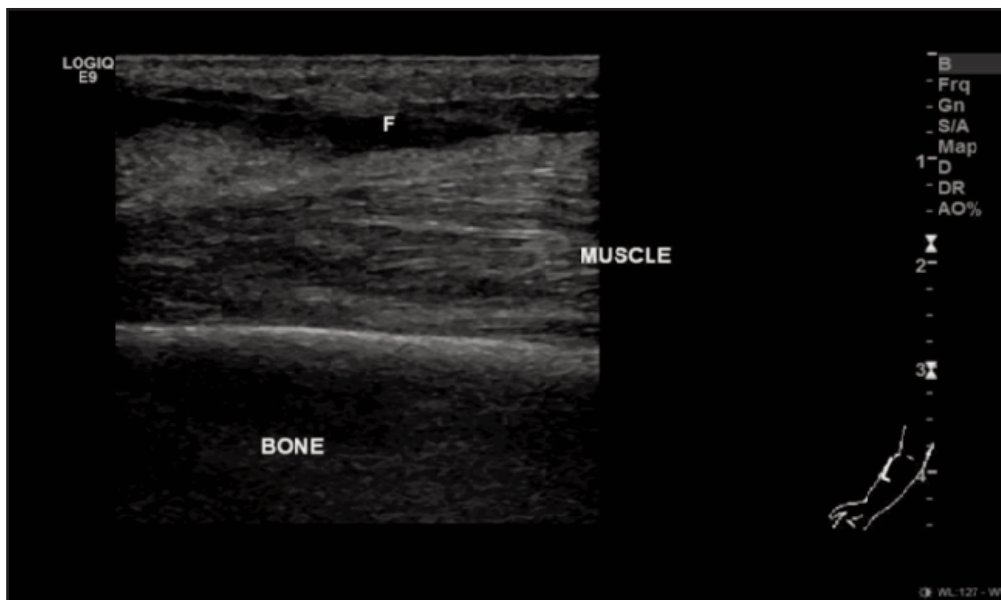
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**Fig. 1:** Abrasion wound at the right distal arm (A), bruises extending to proximal arm (B), Wound after five cycles of vacuum showing a clean wound with improving range of motion of the elbow at the lateral side of the wound (C), and shoulder at the medial site of the wound (D).



**Fig. 2:** Ultrasonography image showing a fluid collection between subcutaneous tissue layer and fascia.

necrosis.<sup>3</sup> It is typically missed during the initial evaluation and may have a delay in presentations ranging from hours or up to months. The lesion typically occurs in the flank, hips, thigh, and prepatellar regions as a result of shear injuries from trauma.<sup>1,4</sup> Initial diagnosis with ultrasonography evaluation can be an effective, more rapid, and low-cost option. Furthermore, ultrasonography had a role in the follow up of closed injuries after aspiration.<sup>5</sup>

The involvement of the upper limb or extremities is unusual.<sup>1</sup> Typically, the presentation consists of fluctuant, painful mass underlying skin with progression over time. The overlying skin may show the mechanism of injury of the original wound such as abrasions and skin contusion such as in this case. Excessive skin necrosis and haemorrhagic bullae are infrequent presentations.<sup>6</sup> It may be associated with fractures or may occur due to blunt injury trauma in the absence of fracture.<sup>3</sup> The clinical management pathway consensus in

the literature recommends that the treatment of MLL should commence from the time of injury until presentation. In the acute period (<1month), compression, aspiration, or incision and drain placement should be considered. The location of the lesion may also play a role because it determines the difficulty of applying significant compression. Dawre et al., proposed a treatment algorithm based on the severity of the lesion.<sup>7</sup> For acute lesions without an associated injury requiring surgery, treatment options include compression dressing with or without sclerotherapy and percutaneous drainage. If there is a recurrence, open debridement would be advisable. In contrast, percutaneous drainage with sclerotherapy would be the first line of management in chronic MLL wounds, failure of which would necessitate open drainage with secondary closure.<sup>7</sup>

Nickerson et al.,<sup>8</sup> proposed a protocol in which the surgeons should initially perform aspiration of all lesions. If the aspirate is less than 50cc, they should apply a compressive dressing and observe. If it is greater than 50 cc, surgical excision with closure over a drain should suffice. They also highlighted some of the challenges to this approach. In the acute period, there is a tendency for necrotic fat and debris or organizing hematoma to prevent adequate aspiration. In the chronic phase, the formation of a pseudo capsule may prevent the complete obliteration of the cavity.<sup>8</sup>

Educating physicians on MLL is important as misdiagnosis is common and that may delay the right management.<sup>2</sup> While options are available for treating the patients conservatively, a delay in the recognition of this condition may require the patient undergoing a major open surgery.<sup>2</sup> It may also cause confusion as MLL may mimic as a soft tissue tumour that can cause pain or lead to rapidly growing subcutaneous mass.<sup>2</sup>

## CONCLUSIONS

MLL injury is a rare upper limb complication which would require a high index of clinical suspicion and emergent attention. Such awareness, early diagnosis and emergent surgical debridement are essential. We need to be vigilant of the possibility of MLL in the upper limb as a differential diagnosis in the management of high energy trauma.

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