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Recurrent Morel-Lavallée lesion obliterated with povidone iodine, a case report

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ABSTRACT

INTRODUCTION AND IMPORTANCE: A Morel-Lavallee lesion is a closed degloving injury due to traumatic separation of the hypodermis from underlying fascia. Accumulation of hemolymphatic fluid that occurs is a potential habitat for bacteria. Management options include percutaneous aspiration, open debridement, or a non-surgical approach, each with recurrence risk. In the event of recurrence, sclerotherapy is used. In this case report, after reviewing povidone iodine's efficacy in treating seromas, we used it as a sclerosant for recurrent Morel-Lavallee lesion as the more established options were unavailable in our setting.

CASE PRESENTATION: A 49-year-old with no known comorbid presented following a motor traffic accident, with left lateral thigh swelling. He was stable systematically, with a tense, tender left lateral thigh swelling and intact neurovascular assessment distally. X-ray and computed tomography ruled out skeletal and vascular injuries. Magnetic resonance imaging revealed a 580 ml type 1 Morel-Lavallee lesion. Open surgical debridement was done to drain and debride the lesion. He developed two recurrences that necessitated percutaneous aspiration. Doxycycline and talc sclerosants were considered; however, due to their unavailability, povidone iodine was used. It is now five months post-intervention without increased pain, recurrence, or wound complications.

CLINICAL DISCUSSION: Recurrence is hypothesized to be due to the persistence of fluid loculations, unobliterated dead space, and pseudocyst formation. Sclerotherapy stimulates inflammation that results in fibrosis of the cavity walls causing its obliteration. Doxycycline, the most studied sclerosant in Morel-Lavallee lesion has an efficacy of 95.7%.

CONCLUSION: The current report is the first successful use of povidone iodine for sclerotherapy of recurring Morel-Lavallee lesions. Based on povidone iodine experiences as a sclerosant, it is associated with increased analgesic requirements. We cautiously propose its use as an alternative in settings where talc powder and doxycycline powder are unavailable.

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1. Introduction

A Morel-Lavallée lesion (MLL) is a closed soft-tissue degloving injury attributed to the traumatic separation of the hypodermis from the fascia due to shearing force [1]. Damage of vascular and lymphatic structures leads to the progressive pooling of blood, lymph, necrotic fat and serous fluid between these layers [2]. The collection stimulates sterile inflammation initially, resulting in vascular permeability and extravasation into the cavity, creating a self-perpetuating lesion. In the final stages of its pathophysiology, a pseudo capsule is formed by chronic inflammation as the body tries to sequester the collection [3]. MLL can occur anywhere on the body. However, most of the lesions occur on the thigh around the trochanteric region due to the skin's hypermobility and the dense

network of capillaries [4]. Although MLL is under-diagnosed, an incidence of 8.3% is reported among patients sustaining trauma to the greater trochanter [5].

The collection is a hospitable habitat for bacteria colonization that occurs in up to 46% of cases despite the lack of an open wound [6]. This risk is increased with late diagnosis and becomes even more significant among patients who also require surgery, as the presence of an MLL is an independent risk factor for surgical site infection [7,8]. Treatment of MLL depends on the lesion's size, proximity to the site of surgical intervention and severity of the injury. Treatment includes observation, percutaneous drainage and open debridement with irrigation, each with its own risk of additional soft tissue injury and reoccurrence [9].

In this case report from the Aga Khan Hospital, Dar-es-Salaam, Tanzania, we describe the management of a 49-year-old male Tanzanian who sustained an MLL on the lateral aspect of the left thigh following a motor traffic accident without associated skeletal injuries. He developed recurrence after initial open debridement and further recurrences after two percutaneous drainage proce-

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dures. The use of povidone iodine as a sclerosant resulted in success. Talc or doxycycline powder, the more conventional sclerosants were both unavailable in our setting [10]. Although povidone iodine use for the treatment of seroma is described in the literature, this is the first report of its use in managing recurrent MLL. In settings where talc or doxycycline powder is unavailable, povidone iodine is a promising alternative for managing recurrent MLL. This paper has been reported in line with the SCARE 2020 criteria [11]. This article has been registered with the Research Registry with identification number researchregistry6404 and can be found through the following hyperlink Browse the Registry – Research Registry.

2. Case presentation

2.1. Introduction and background

Our patient is a 49-year-old Tanzanian male with no known comorbidities, not on medications, no drug allergies, no prior surgical history, and does not smoke or drinks alcohol. He presented 4 h following a motor traffic accident whereby he was hit on his left side by a motorbike while crossing the road. He reported severe left thigh pain and swelling on the lateral aspect that increased progressively without weight-bearing limitation. He had no other associated injuries. Initial first aid care was given at a satellite clinic before being referred to our main hospital.

3. Clinical and diagnostic assessment

On examination, he was alert, oriented, not pale, blood pressure 140/90 mmHg, pulse rate 78, respiratory rate 16, saturating at 99% at room air with an apparent left thigh lateral swelling. The swelling was about 15 cm by 10 cm, no change in skin color, no break in the skin, had tire marks over the swelling, on palpation, there was tenderness with areas of fluctuance and surrounding tense skin. Range of motion of the hip, knee and ankle joint were intact, dorsalis pedis pulse was intact with no reduced sensation in the distal lower limb. Other system examinations were normal.

Initial X-rays were done as part of the trauma series, which revealed no obvious fracture (Fig. A1), and E-FAST did not show hemoperitoneum or pericardial tamponade. Vascular injury without signs of hemorrhagic shock, with soft tissue hematoma on the left thigh, was suspected. An initial bedside ultrasound was done on the left thigh at the emergency department and was inconclusive. A CT angiogram was then done, which revealed a hyperdense mass at the left thigh's anterolateral aspect between the subcutaneous and muscular layer with no evidence of active bleeding or any vascular pathology (Fig. A2). With suspicion for an MLL, an MRI of the left thigh revealed an extensive subcutaneous fluid collection of about 580 ml showing increased T2-weighted signal intensities and decreased T1-weighted signal intensities consistent with a type I MLL lesion based on MRI with a contusion of the underlying muscular layer with no capsule (Fig. A3) [3]. The orthopedic surgeon suggested a plan to debride the lesion to prevent the chances of necrosis and subsequent infection of the MLL.

4. Therapeutic information

Following counseling and informed consent, preoperatively, he was initiated on intravenous (IV) clindamycin 600 mg 8 hourly. A senior orthopaedic surgeon carried out the procedure under general anaesthesia. Two separate incisions, each around 3 cm, were made at the swelling's proximal and distal aspects. About 500 ml of serosanguinous fluid was drained, the cavity irrigated, suctioned and gently curetted (Fig. A4 and video uploaded to <https://youtu.be/RsxYvtOd8xU>). Talc powder or doxycycline powder for sclerodexis were considered; however, neither was available. A vacuum drain was placed, and both incision sites were closed.

Postoperative compressive bandaging was placed, and he was kept on IV clindamycin 600 mg 8 hourly, IV paracetamol 1 g 8 hourly, intramuscular pethidine 100 mg 8 hourly, IV ondansetron 8 mg when nauseated. Day 1 postoperative, the drain had collected 200 ml of serous fluid, physiotherapy was initiated and tailoring down of analgesia. Day 3 postoperative, the amount of serous fluid over 24 h was less than 50 ml; thus, the drain was removed, the dressing was done, and he was discharged on oral antibiotics and analgesia to follow up at the outpatient clinic. The microbiological culture of the collection did not grow organisms.

4.1. Follow up and outcomes

1-week post-discharge, he presented with a swelling at the same site. He was counseled for suspicion of recurrence and agreed to undergo bedside percutaneous aspiration, which revealed 200 ml of seroma and compression dressing was applied. He developed a recurrent swelling twice over two weeks and underwent percutaneous aspirations each time, draining about 200 ml of seroma each time. Consultation with a general surgeon suggested using povidone solution for sclerodexis due to unavailability of talc or doxycycline powder, which he had previously used in cases of persistent seromas and for pleurodesis. The patient was counseled and consented to percutaneous aspiration with povidone iodine irrigation into the cavity, followed by compression dressing. It is now five months post-discharge with no evidence of re-accumulation, increased analgesia requirements, or hypersensitivity reactions. The wound is currently healed wound with no evidence of surgical site infection.

5. Discussion

In evaluating patients with an MLL, associated injuries must be ruled out, which in our case, X-rays, E-FAST and CT angiograms ruled out fractures, visceral and vascular injury. An MRI is considered the modality of choice, with superiority over an ultrasound, to evaluate an MLL and further categorize it into six types based on the pseudo-capsule, T1, T2 signal intensity, enhancement, shape and radiological appearance of the collection [2]. Available literature has established that an MLL can be colonized with bacteria despite the closed nature of injury; hence the need for early debridement and antibiotics should be considered [6].

An MLL of less than 50 ml, not fluctuant, not painful, not bothersome to the patient, with no associated skeletal injury, can be managed conservatively with compression banding [4]. A study from The Mayo Clinic showed that an open approach is superior to the less invasive percutaneous procedures in cases where intervention is needed. The reoccurrence rate of 15% is associated with an open approach, compared to 56% of the percutaneous approach [12]. From these observations, the Mayo Clinic practice guidelines recommend that aspiration of more than 50 ml warrants open surgical debridement [12]. The practice was consistent in our case whereby we undertook open debridement following diagnosing a 500 ml MLL.

Open debridement with an incision over the entire lesion effectively prevents recurrence, however concerns over the compromise of the subdermal vascular plexus, the remaining perfusion source to the skin following disruption of perforators, risks of significant skin loss [13]. Therefore, small studies have adopted a less invasive approach with smaller incisions at either end of the lesion to achieve simultaneous cavity access for debridement and irrigation and skin preservation, at possible risk of recurrence [14,15]. As with our case, we created two ports at either end of the MLL to gain access to the lesion and placed a vacuum drain to decrease recurrence chances. We did not encounter superficial tissue compromise during the follow-up period.

Despite the choice of intervention, reoccurrence is a significant complication [12]. Reoccurrence has been hypothesized to be due to the persistence of fluid loculations that was not drained, unobliterated dead space, and formation of a pseudocyst in chronic cases. Sclerotherapy has been advocated to obliterate the persistent dead space in this scenario by stimulating inflammation that would culminate fibrosis and organization on the cavity walls causing its obliteration [16]. Agents used for sclerotherapy include talc, doxycycline, ethanol, bleomycin, vancomycin and tetracycline, the most studied being doxycycline with shown efficacy of 95.7% with risks of increased pain, and with talc use a risk of infection [17–19]. We encountered two recurrences despite percutaneous options. The unavailability of the established sclerosants led us to improvise sclerotherapy of an MLL with povidone iodine as it has been used in post-surgical wound seromas [10]. We did not encounter recurrence, increased pain, or wound infection at five months of follow-up.

The current report is the first successful use of povidone iodine for sclerotherapy of recurring MLL. Although we did not encounter any complications, based on povidone iodine experiences as a sclerosant, it is associated with increased analgesic requirements. We cautiously propose povidone iodine for sclerotherapy of recurrent MLL as a potential alternative in settings where talc powder and doxycycline powder are not available.

Patient perspectives

It was frustrating at the start that despite multiple measures, I still had the swelling and feared it would never resolve. However, I am glad it has resolved without needing to come to the hospital in over three months.

Declaration of Competing Interest

The authors report no declarations of interest.

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Ethical approval

Case study is exempt from ethical approval in my institution.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Allyzain Ismail: Writing the paper, collection of data, literature review.

Masawa Nyamuryelung'e: Study concept, writing the paper, data analysis, supervision.

Kumar Rajeev: Supervision.

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Appendix A



Fig. A1. Trauma series X-ray of pelvis + Left femur.



Fig. A2. CT angiogram of lower limbs + reconstruction.

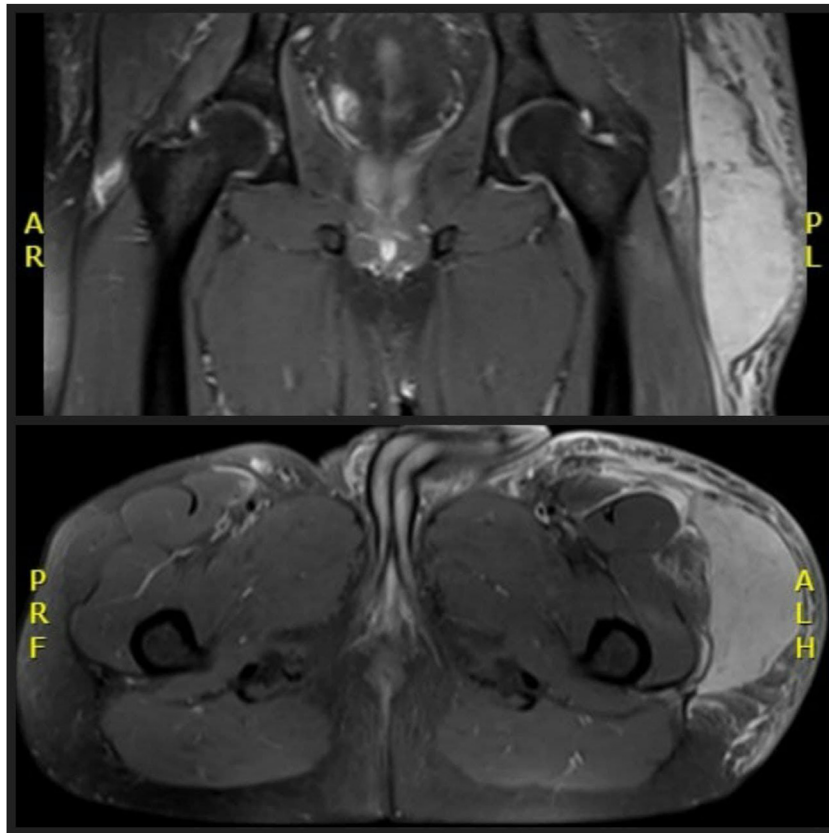


Fig. A3. MRI pelvis + thigh.



Fig. A4. Open surgical debridement of Morel-Lavallee lesion with two separate incisions at the proximal and distal end of the lesion.

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