CASE REPORT

MOREL-LAVALLÉE LESION ON THE LEFT CALF OF A YOUNG GHANAIAN FEMALE – A CASE REPORT

Nyarko OO[1]; Ayisi-Boateng NK[2]; Blay LK[1], Arkorful J[3], Konadu P[1]
[1]Surgical Unit, University Hospital, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana;
[2]Department of Medicine, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana;
[3]Radiology Unit, University Hospital, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

Abstract

Objective: Morel-Lavallée lesions are frequently misdiagnosed soft tissue injuries. They are closed degloving injuries associated with high energy trauma with shearing forces. In this report, we discuss the challenges in making early diagnosis and instituting timely and appropriate management of such cases.
Case Presentation: The index patient is a 36-year-old female who presented with a 3-week history of fluctuant and tender left leg swelling associated with skin bruises after experiencing a blunt trauma secondary to a motor vehicular accident. Ultrasound findings of the left leg showed a collection with internal echoes and septations occupying a space between the subcutaneous area and superficial fascia of the upper and middle third of the left leg. We made a diagnosis of a Morel-Lavallée lesion and performed an open debridement and irrigation.
Conclusion: Early diagnosis and treatment are of utmost importance as misdiagnosis and delayed diagnosis can lead to deleterious consequences and death.

Key words: *Morel-Lavallée lesion, degloving injuries, shearing forces, open debridement and irrigation, case report*

Introduction

Morel-Lavallée lesion was originally described by French surgeon Victor Auguste Francois Morel-Lavallée in 1853.[1] It is a closed soft tissue degloving lesion resulting from high energy direct shearing forces applied to the skin.[2,3] The high energy impact disrupts lymphatic and vascular networks creating a potential space most commonly filled with blood, fat, lymph and debris between the hypodermis and the underlying fascia.[4,5] The contents are converted to serosanguinous fluid as the disease progresses.[4] They commonly present on the pelvis, thighs and knee joint as a result of motor vehicular accidents, fall from heights and high-risk sporting activities.[2,3,6] The lesions can also less commonly present on the lumbosacral, gluteal regions and the lower leg or calf.[7] They are often unilateral and present with swelling, skin bruises and pain. Morel-Lavallée lesions are of concern especially in low resource settings where there is lack of Magnetic Resonance Imaging (MRI), the gold standard for diagnosis.[1,8] The location, size, duration of the lesion and patient-related factors are considered when choosing an appropriate management option for Morel-Lavallée lesions.[5] Management options include open debridement and irrigation, percutaneous drainage with drain placement or conservative management in some cases.[5,7] Morel-Lavallée lesions are associated with a high level of perioperative infections in about 46% to 48% of cases.[4,5] Chronic Morel-Lavallée lesions may also lead to deformities, skin necrosis and pseudocyst formation.[5] We present a rare incidence of a Morel-Lavallée lesion in sub-Saharan Africa on the calf of a 36-year-old woman involved in a motor vehicular accident.

Corresponding Author: **Dr. Obed Ofori Nyarko**
Surgical Unit, University Hospital, KNUST
PMD, University Hospital, KNUST
Email Address:obednyarko360@gmail.com
Conflict of Interest: None Declared

Case Presentation

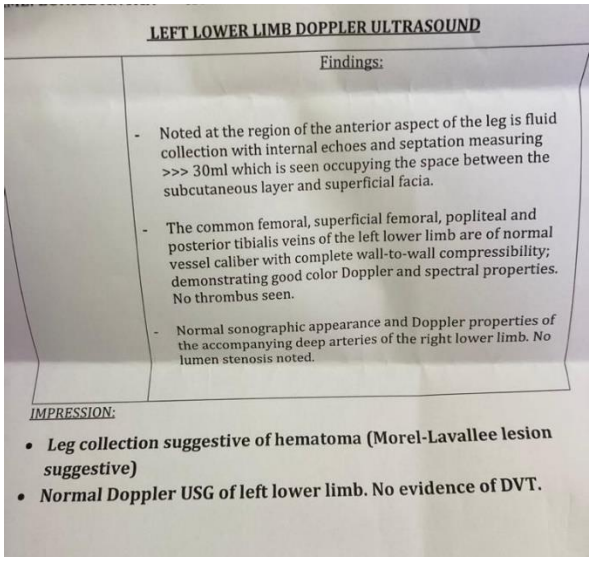
A 36-year-old woman presented to the outpatient department with a 3-week history of left leg swelling after being involved in a motor vehicular accident. She suffered blunt trauma to the left leg when her vehicle came to an abrupt stop upon collision with an approaching vehicle. She had previously presented to the emergency room right after the accident and X-rays showed no signs of a fracture, hence she was discharged home after she was stabilized. The swelling on the left leg, which was associated with bruises, was noticed immediately after the accident. The swelling gradually increased in size and was associated with pain when

walking. On examination, there was a swelling 20cm by 10 cm in size over the upper and middle third of the left lower leg, it was tender, not warm to touch and fluctuant.

Figure 1: A picture showing the swelling on the lower leg of our index patient

Radiographic images of the left thigh and leg showed no bone fractures (**figure 2**). An ultrasound of the lesion showed a collection with internal echoes and septations measuring >30mls occupying a space between the subcutaneous area and superficial fascia (**figure 3**). Although MRI scan is the mainstay of diagnosing Morel-Lavallée lesion, we were limited by both patient and facility resource-constraint factors, hence, relied on the history, examination and ultrasound findings to make a diagnosis.

Figure 2: A normal x ray of the tibia and fibula of our index patient



LEFT LOWER LIMB DOPPLER ULTRASOUND

Findings:

- Noted at the region of the anterior aspect of the leg is fluid collection with internal echoes and septation measuring >>> 30ml which is seen occupying the space between the subcutaneous layer and superficial facia.
- The common femoral, superficial femoral, popliteal and posterior tibialis veins of the left lower limb are of normal vessel caliber with complete wall-to-wall compressibility; demonstrating good color Doppler and spectral properties. No thrombus seen.
- Normal sonographic appearance and Doppler properties of the accompanying deep arteries of the right lower limb. No lumen stenosis noted.

IMPRESSION:

- *Leg collection suggestive of hematoma (Morel-Lavallee lesion suggestive)*
- *Normal Doppler USG of left lower limb. No evidence of DVT.*

Figure 3: An image of the ultrasound findings of the leg of our index patient

The client was counselled on the condition and prepared for open debridement and irrigation a day after presentation. Approximately 200mls of serosanguinous fluid was drained from the lesions. She was put on antibiotics, analgesia and discharged a day after surgery. She underwent daily dressing changes and did not develop any complications after the procedure.

Discussion

Morel-Lavallée lesions are soft tissue degloving injuries that often go undiagnosed or misdiagnosed as abscesses, fat necrosis or tumours.[5] The patient presented late and this can be attributed to hospital and physician-related factors. These include early discharges in the emergency room especially with cases with no underlying fractures.[2] Morel-Lavallée lesions may present simultaneously with the fractures immediately after the injury or days after the injury.[5] They are said to be present in about 8% of all acetabular fractures.[4] They may also occur with blunt injuries in the absence of fractures. As it was in this case, in Morel-Lavallée lesions, the most common mechanism of injury is a shearing force on a blunt surface.[9] The clinical presentation depends on the energy of impact, site of impact, rate of accumulation of fluid into the potential space and other patient related factors.[5] It may present with swelling and skin bruises which may take days to present and hence delay diagnosis.[5] Our client presented immediately after the traumatic event with swelling and skin bruises, however, negative X-ray findings and a low index of suspicion led to delayed diagnosis. Morel-Lavallée lesions may prove fatal in some cases where there are large blood collections leading to hypovolemic shock.[10] This emphasizes the need for early diagnosis and timely treatment. Trauma cases where there are bruises on the pelvis, thighs and lower legs should also have a high index of suspicion. Polytraumatic cases with

more obvious injuries may distract physicians from the less obvious Morel-Lavallée lesion.[5]

Management options such as open debridement and irrigation used in this case are useful and recommended to remove the culture medium which can foster bacterial colonization of the space.[1,5,11] We chose this treatment option due to its effectiveness in preventing complications of skin necrosis, infections and even death.[1,5] Our index patient presented for daily wound dressing and did not suffer any complications after the procedure. She expressed satisfaction with the level of care and treatment modalities offered her.

Conclusion

We advocate for a high index of suspicion in cases of high energy blunt trauma involving shearing forces to prevent delays in diagnosis of Morel-Lavelle lesions. Early diagnosis and treatment are crucial to prevent complications and death. Once a diagnosis is made, clinicians should critically assess the patient and promptly institute appropriate intervention to achieve positive outcomes.

References

1. Nair A V., Nazar PK, Sekhar R, Ramachandran P V., Moorthy S. Morel-Lavallée lesion: A closed degloving injury that requires real attention. *Indian J Radiol Imaging*. 2014;24:288-290. doi:10.4103/0971-3026.137053
2. Fawcett RJ. Morel-Lavallée lesion in a male cyclist. *BMJ Case Rep*. 2013;2013. doi:10.1136/bcr-2013-201424
3. John F. Carroll. Morel-Lavallee Lesions - Radsource. MRI Web Clinic. Published June 2010. Accessed May 4, 2021. https://radsource.us/morel-lavallee-lesions/
4. Ben Sharareh, Benjamin C. Taylor. Morel-Lavallee Lesion - Trauma - Orthobullets. Published 2021. Accessed May 4, 2021. https://www.orthobullets.com/trauma/422820/orel-lavallee-lesion
5. Scolaro JA, Chao T, Zamorano DP. The Morel-Lavallée Lesion: Diagnosis and Management. *J Am Acad Orthop Surg*. 2016;24:667-672. doi:10.5435/JAAOS-D-15-00181
6. McLean K, Popovic S. Morel-Lavallée lesion. Radiographics. 2017;37:190-196. doi:10.1148/rg.2017160169
7. Takahara S, Oe K, Fujita H, et al. Missed Massive Morel-Lavallee Lesion. *Case Rep Orthop*. 2014;2014:1-4. doi:10.1155/2014/920317
8. Mellado JM, Bencardino JT. Morel-Lavallée lesion: Review with emphasis on MR imaging. *Magn Reson Imaging Clin N Am*. 2005;13:775-782. doi:10.1016/j.mric.2005.08.006
9. Tejwani SG, Cohen SB, Bradley JP. Management of Morel-Lavallee lesion of the knee: Twenty-seven cases in the national football league. *Am J Sports Med*. 2007;35:1162-1167. doi:10.1177/0363546507299448
10. Rashid A, Singh MK, Feng SS, Yatim NM, Sahak MY, Mahmud R. Lethal Morel-Lavallée lesion: A forensic radiology-pathology correlation. *Radiol Case Reports*. 2020;15:1280-1284. doi:10.1016/j.radcr.2020.04.054
11. Kalaci A, Karazincir S, Yanat AN. Long-standing Morel-Lavallée lesion of the thigh simulating a neoplasm. *Clin Imaging*. 2007;31:287-291. doi:10.1016/j.clinimag.2007.01.012