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Morel- Lavallée Lesion: Post Traumatic Lesion That Requires Special Attention

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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 42-year-old female with history of trauma one week back, who presented with elongated swelling over the postero-lateral aspect of her left thigh. Local examination showed fluctuating fluid collection. MRI showed variable intensity fluid collection in a potential space between the subcutaneous tissue and deep fascia in her left thigh. Percutaneous decompression and evacuation of the collection with systemic antibiotic therapy resulted in rapid improvement.*

Keywords: *Closed gloving injury, Mellado and Bencardino classification, Morel-Lavallee lesion, Percutaneous drainage.*

I. INTRODUCTION

Morel-Lavallee syndrome (MLS) is a significant post-traumatic soft tissue injury in which the subcutaneous tissue is torn away from the underlying fascia, creating a cavity filled with hematoma and liquefied fat. We report a case of type 1 Morel-Lavallee lesion involving the left thigh in a young female. We discuss the magnetic resonance imaging findings MLS.MRI is the modality of choice for investigation of Morel-Lavallée lesion. Early diagnosis and management of the lesion is essential so as to prevent complications like infections or extensive skin necrosis.

II. CASE REPORT

A 42-year-old female presented to the radiology department with swelling over the posterolateral aspect of upper portion of left thigh with nagging pain over the swelling. She had history of injury one week ago and was admitted with multiple pelvic bone fractures. The thigh Swelling appeared about 3 days after the injury and was gradual increase in size by the time. Clinical examination revealed a fluctuant, tender and elongated swelling over the posterolateral aspect of her left thigh. Laboratory evaluation showed elevated leucocyte count and ESR.

Plain radiograph was done and revealed comminuted superior and inferior pubic rami fractures. Ultrasonography was done which revealed a hypoechoic collection with no internal echoes in the posterolateral aspect of the thigh. On MRI, the collection at lateral aspect of left thigh was hyperintense on T2WI and hypointense on T1WI in the nondependent region with no fluid levels. [Fig 1 and Fig 2]. The lesion was

measured 32.5cm x10cm x6.2cm in its maximum cranio- caudal, AP and transverse diameter respectively. The collection was located deep to the subcutaneous plane, superficial to iliotibial band [Fig 2]. Visualized muscles and rest of the soft tissue were normal. Left hip joint was normal. It shows minimal wall enhancement with no evidence of enhancing soft tissue components (Fig3).

Based on the history, clinical features and MRI characteristics the diagnosis of Morel-Lavallee lesion was made.

Differential diagnosis includes 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.

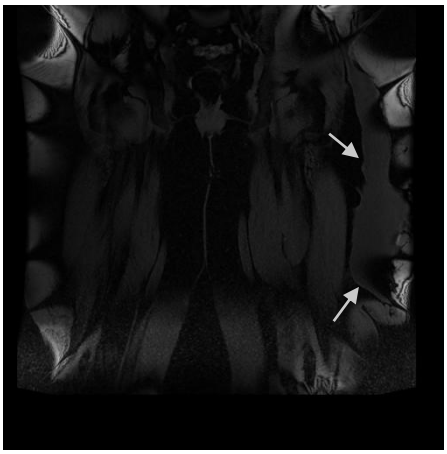

Figure 1:T1 weighted images in MRI shows a subcutaneous elongated fluid collection (arrows)at the upper lateral left thigh region, it measures 32.5cm x10cm x6.2cm in its maximum dimensions. It shows low signal inT1WI.

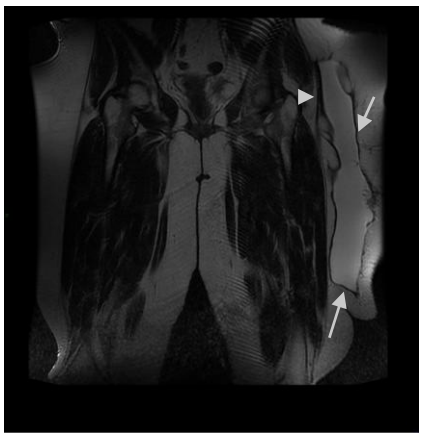

Figure2: T2 weighted images in MRI with subcutaneous fluid collection (long arrows) at the upper lateral left thigh region, just overlying left iliotibial band (short arrow) with high signal intensity.

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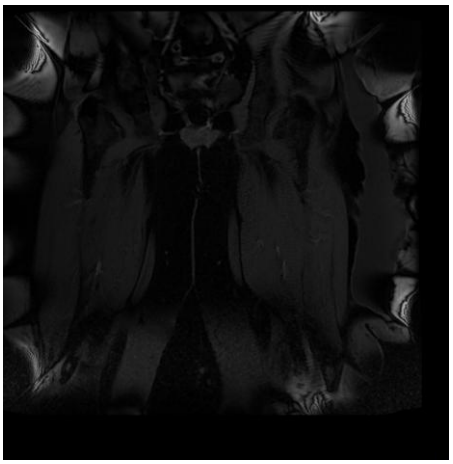

Figure3: post contrast T1W1, shows thin mild enhanced wall with no evidence of enhancing soft tissue components. Underlying muscles and osseous structures are grossly preserved. No significant regional lymph node is seen.

III. DISCUSSION

A Morel-Lavallee lesion is a closed degloving injury after trauma first described by Victor Auguste Francois Morel-Lavallee. They occur 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].our case was presented after 3days with left leg swelling.

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 haemo-lymphatic 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 hemolyphatic 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 [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 Bencardino MRI classification.

The lesion can be either painful or asymptomatic and up to one third of the patients do not recall any significant trauma. Delay in the diagnosis results in the development of collections with bulging and deformity of the subcutaneous cellular tissue[7].Diagnostic delays of up to 34 years have already been described[8,9].These collections may develop rapidly when the arterial bed is involved, or otherwise slowly, in cases of injury to lymphatic vessels[8]..

Considering that Morel-Lavallée lesions may remain undiagnosed for long periods, it is important for the radiologist to know the characteristics of acute and chronic lesions, as well as their therapeutic implications. The appearance of the lesions depends on the amount of present blood, lymph and fat, as well as the time elapsed from the trauma[10].

The differential diagnosis for MLL includes subcutaneous hematoma, hemangioma, fat necrosis, and soft tissue sarcoma. The history of trauma, characteristic location, and MRI features may contribute to a correct diagnosis.

The treatment depends on the duration, size, and presence of a capsule in the lesion. Small acute lesions that have not developed a capsule can be treated conservatively by application of compression bandage. However, those that persist and have capsule formation may require more aggressive treatment. These lesions can be managed with early percutaneous drainage, debridement, irrigation, and suction drainage.[11] These lesions can be complicated by infection, necessitating the use of antibiotics. In rollover trauma with pelvic fractures, urgent surgery with debridement is necessary.

IV. CONCLUSION

Morel-lavallee lesion which occurs due to closed degloving injury. 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 lesion. Missed diagnosis can lead to contour deformity as a result of local tissue necrosis.

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