

**Case report**

**Morel-Lavallée lesion in a 'non-traumatic' thigh: a diagnostic challenge!**

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**Abstract**

**Background:** Morel-Lavallée Lesion (MLL) or Morel-Lavallée Seroma (MLS) is a post-traumatic seroma that occurs following a closed degloving injury. It is very important for trauma surgeons to be aware of this relatively rarely reported entity as early diagnosis increases the likelihood of successful management. **Case report:** We present a patient, wherein the patient had no history of trivial trauma and presented with a gradually growing swelling of left thigh, that was clinically and radiologically diagnosed as a soft tissue neoplasm, successfully managed by surgical excision and were reported to be a MLS. The clinical diagnostic dilemma was solved by the histopathologist! **Conclusion:** A differential diagnosis of MLL should be kept in mind in patients presenting with soft tissue swellings.

**Keyword:** Morel-Lavallée Lesion; Morel-Lavallée Seroma; lipoma

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**Introduction**

MLS was first described in 1863 by the French surgeon Victor Auguste Francois Morel-Lavallée as fluid collections dissecting fatty tissues<sup>1</sup>. This term has now expanded to encompass any closed degloving injury causing persistent fluid collection. Though these lesions can occur anywhere, they are particularly common in the proximal thigh and in the trochanteric region<sup>2</sup>. Though MLS are most common after violent tangential trauma such as road traffic accidents (RTA), usually in association with pelvic/acetabular fractures, they have also been reported after surgical procedures such as abdominoplasty and in a few cases, the patient does not recall the occurrence of trauma, as in our case<sup>3</sup>. The shearing forces due to trauma cause the mobile skin and subcutaneous tissue to avulse from the relatively fixed aponeurotic fascia. This causes injury to blood vessels and/or lymphatics causing accumulation of fluid in the potential space formed. The hematoma/seroma thus formed can later encapsulate<sup>2,4</sup>.

A gradually growing swelling of thigh can lead to

a diagnostic dilemma. Clinically they can range from lipomas: the commonest benign tumours, to the malignant ones, the sarcomas. A definitive pre-operative diagnosis is important to avoid extended resections/mutilating surgeries that are required for malignant lesions. Various diagnostic modalities are in vogue, of which Magnetic Resonance Imaging (MRI) seems to be the best<sup>5</sup>.

There are various reported treatment modalities for MLS. Recently there has been a shift towards conservative management. This is especially true if MLS is identified early, before pseudocyst formation<sup>6</sup>. Patients presenting later after the formation of fibrous capsule generally fail to respond to conservative management, warranting surgical excision, as in our patient.

**Case report**

A 21-year-old male with no comorbidities presented with a gradually growing swelling of left thigh of 7 months duration, with no previous history of trauma, pain or inability to walk. He gave no history of bleeding episodes in the past. General examination

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was unremarkable. Local examination revealed a non-tender, firm, oblong left thigh swelling measuring approximately 20x10 cm with a smooth surface with no dilated veins and absent fluctuation and restricted mobility (Figure 1). The gait, peripheral pulses and sensations were normal with no significant inguinal lymphadenopathy. A clinical diagnosis of lipoma of the left thigh was made. Routine investigations were normal. A MRI of the left thigh revealed a well-defined unilocular cystic lesion measuring 20x10x6 cm which was hyperintense on both T1-weighted and T2-weighted sequences, seen along the left proximal fascia lata, in close proximity to vastus lateralis and gluteus maximus muscles with maintained intervening fat planes. The cyst showed a thin smooth capsule which was hypointense on all sequences, and multiple small hypointense mural nodules were seen projecting into the lumen (Figure 2). The patient was subjected for excision of the mass. Intraoperatively, there was a tense, well-encapsulated, cystic mass which was not infiltrating the surrounding muscles or the neurovascular bundle (Figure 3). While dissecting superiorly the capsule opened up which exuded chocolate colored fluid. The cyst was excised *intoto* (Figure 4). The patient made a good postoperative recovery. Histopathology revealed a lesion with a nodular configuration composed of central amorphous eosinophilic material surrounded by haemosiderin laden foamy macrophages, multinucleate giant cells, proliferating vascular channels, cholesterol clefts and collagen deposition which was consistent with MLL (Figure 5). Patient has been on close follow-up for the last two years and has no recurrence.

**Ethical approval:** This case report was approved by local Ethics Committee prior to submission.

### **Discussion**

MLL is synonymous with post-traumatic soft tissue cyst, post-traumatic extravasation or Morel-Lavallée effusion and is a closed degloving injury resulting from abrupt shearing of subcutaneous tissue and skin from underlying fascia creating a cavity filled with blood/lymph. The initial injury results in the formation of a potential space into which blood, lymph and debris accumulate. Progression of inflammatory reaction results in the formation of a pseudocapsule comprising of predominantly fibrous tissue. This encapsulation is responsible for the persistent nature of this condition, making treatment long and difficult<sup>1-4</sup>.

MLL most often presents within hours to days post-trauma, seen unilaterally and commonly coexisting

with underlying fractures. It is most commonly found adjacent to bony prominences, characteristically appearing over the greater trochanter of the femur. However, there are reports of MLL occurring at other sites such as along the flank, knee, buttocks, lumbar spine and even along the calf<sup>7</sup>. The clinical presentation is usually a patient with history of a RTA/contact sport injury presenting with swelling, pain, stiffness and bruising. There is generally a reduction in range of motion of involved muscles and hypoesthesia of the overlying skin<sup>3</sup>.

The characteristic clinical presentation is often not seen and MLL is often overlooked<sup>7</sup>. A variety of other conditions clinically mimic MLL such as fat necrosis, hematomas, hemangiomas, muscle contusions and imaging is often required for diagnosis. MRI is the imaging modality of choice as it can clearly demonstrate the relationship of the collection with the underlying fascia, and even demonstrates the fibrous or hemosiderin laden pseudocapsule which is the hallmark of this condition. The characteristic MR appearance is a discrete oval mass with well-defined borders between the muscle fascia and deep subcutaneous tissue. MLL usually are hyperintense on T2 weighted sequence<sup>5,7</sup>.

The prognosis of MLL depends greatly on time to initiation of treatment and extent of underlying injury. Prompt treatment is paramount as neglected cases may get infected and lead to extensive skin necrosis. Also delay in treatment leads to formation of pseudocapsule, making complete resolution difficult<sup>8</sup>. Conservative management is most effective in cases presenting early. It entails percutaneous drainage with immediate post-procedure compression bandaging. Simple compression alone has been shown to effectively treat many cases of MLL<sup>6</sup>. Another more aggressive approach tried for cases presenting early with a high rate of success is to aspirate the collection, debride the cavity with a plastic brush and then lavage the cavity, closing it with a suction drain. Sclerosants (doxycycline, talc and absolute alcohol) have been used with some success<sup>9</sup>. A study using doxycycline showed complete resolution of all 16 lesions with a mean time of 5.5 weeks<sup>10</sup>.

Surgical excision is usually warranted for chronic MLL in which conservative management is ineffective. The classically described surgical excision involves evacuation of the collection, excision of the peripheral capsule and debridement of the necrotic tissue, either leaving the wound open or closed primarily<sup>6,7</sup>. Treatment of chronic cases with liposuction has been tried, successfully dealing

with both the pseudocyst and contour deformity that is not addressed by sclerotherapy. Use of fibrin glue to close the potential space followed by compression bandaging has been used in a case series with all 7 patients showing a successful outcome<sup>11</sup>. Quilting sutures, a method initially described to manage seroma formation following abdominoplasty has been shown to have successful outcomes<sup>4</sup>. Injection of a dermal dye has been tried to identify the lymphatics draining into the cavity, which were then ligated, before surgical excision<sup>6</sup>.

The long-term outcome of MLL varies considerably, depending mainly on the time to presentation and severity of lesion. Most patients are left with some residual loss in muscle strength or limitation of activity, but this is also highly variable. The most important factor that improves patient outcomes is early diagnosis which requires a high index of suspicion. Increased awareness of this condition will aid in identification especially in the setting of polytrauma where MLL is often overlooked as a result of more serious wounds.



Figure 1: Left thigh swelling.

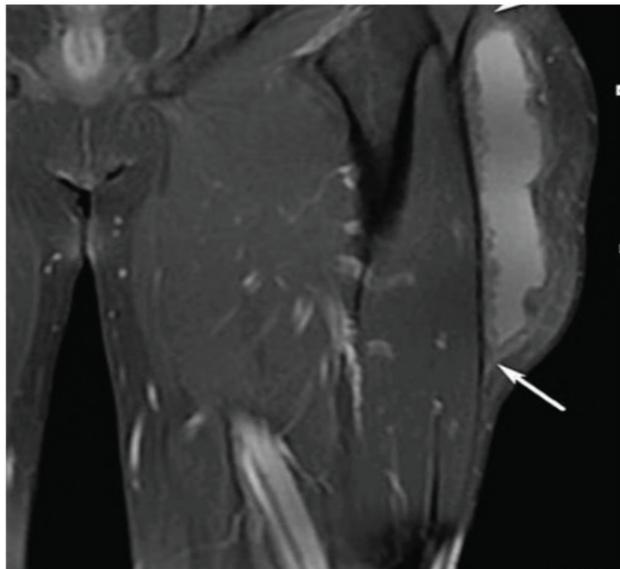


Figure 2: MRI showing a fluid filled lesion (arrow).



Figure 3: Intraoperative picture showing a well-defined, glistening capsule.



Figure 4: Excised specimen.

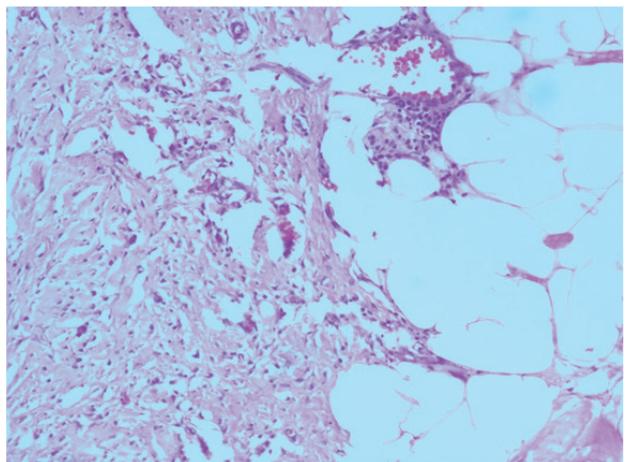


Figure 5: Photomicrograph showing tissue composed of central amorphous eosinophilic material surrounded by haemosiderin laden foamy macrophages, multinucleate giant cells, proliferating vascular channels, cholesterol clefts and collagen deposition. (H & E, x20).

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