

# Post-traumatic left thigh swelling

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## PART A

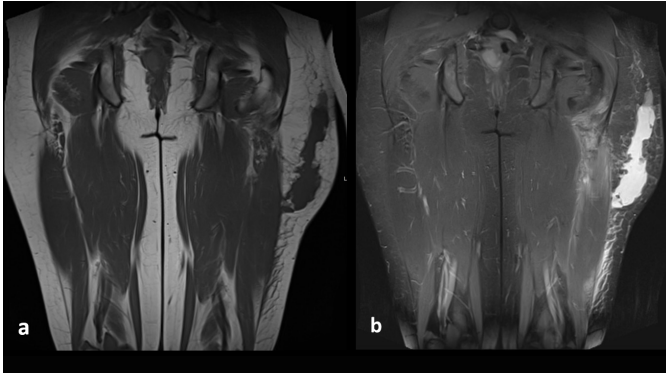
A 25-year-old woman presented with left hip pain after falling out of a first-floor window. Initial evaluation revealed left wrist and left ankle fractures. On the next morning, the patient woke up with pain on her left

hip. Clinical examination revealed swelling and bruises over the lateral aspect of the proximal left thigh. Magnetic Resonance Imaging (MRI) (**Figs. 1-3**) as well as plain radiographs (**Fig. 4**) were performed.

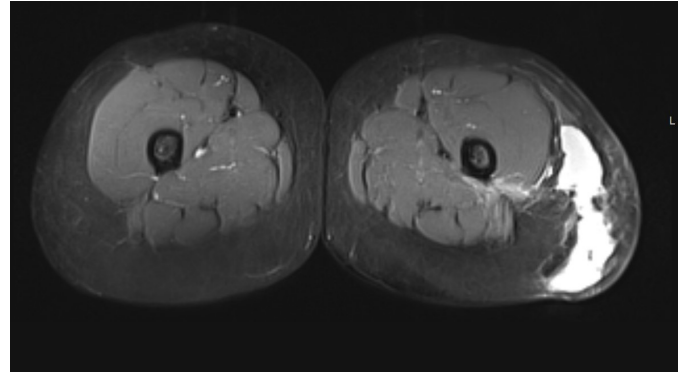


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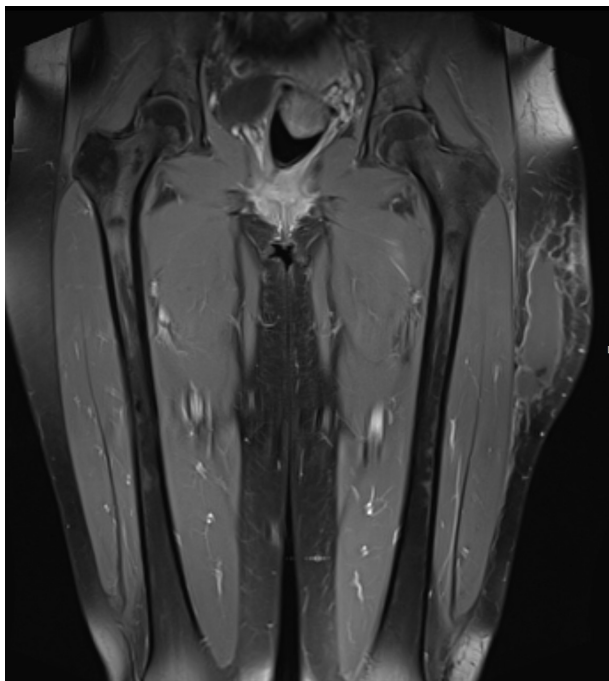
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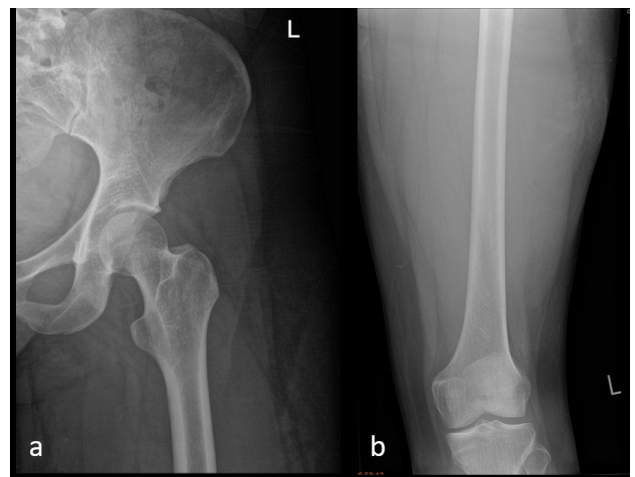
**Fig. 1.** Coronal MR images: **a.** T1-W, **b.** Fat saturated T2W.



**Fig. 2.** Axial fat saturated T2-weighted MR image.



**Fig. 3.** Post-contrast coronal fat saturated T1-W MR image.



**Fig. 4.** Anteroposterior plain radiographs: **a.** left hip, **b.** left thigh.

## PART B

***Diagnosis: Morel-Lavallée lesion (MLL) of left thigh with avulsion of left distal gluteus maximus insertion.***

MRI demonstrated an 18 cm long by 13 x 3.5 cm maximum cross-section collection within the subcutaneous fat of the lateral left thigh (Figs. 1, 2) with rim enhancement after contrast administration (Fig. 3). Intralesional nodules of fat signal intensity were also visible, representing fat remnants (Figs. 1-3), an imaging feature which is highly suggestive of MLL [1, 2]. Additionally, the left gluteus maximus distal tendon insertion appeared to be avulsed from its femoral attachment and displaced dorsally (Fig. 2). Plain radiography showed a mass-like lesion (Fig. 4).

MLL, first described by French physician Victor Auguste Francosis Morel-Lavallée in 1848, is a significant post-traumatic closed degloving injury where skin and subcutaneous tissue get separated from the deep, underlying fascia [3, 4]. This causes the rupture of small bridging vessels and lymphatic channels, leading to the formation of a cavity filled with blood, lymph and liquified, sometimes even necrotic, fat tissue [3, 5, 6]. In some instances, a fibrous pseudocapsule, generated by chronic inflammatory reaction, may develop, resulting to a slow continued expansion and chronicity of the lesion [5-7]. MLL is known with several different names such as ML syndrome, ML seroma, ML effusion, pseudolipoma, organising haematoma, post-traumatic extravasation or post-traumatic soft tissue cyst [6, 7].

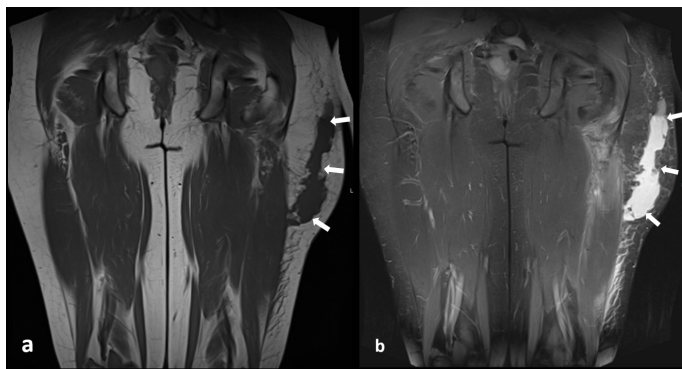
The most common site of this lesion is the lateral aspect of the proximal thigh, however other anatomic sites have also been described in the literature such as periscapular, gluteal and lumbar regions, ankles and prepatellar region [5, 7-9]. Regarding the aetiology of this lesion, it is usually caused by acute trauma, typically due to a blunt shearing force applied across the surface of the skin overlying a bony promontory. Motor vehicle accidents are considered the most common mechanism, followed by falls and sport related injuries [6].

MLLs may present as painful swelling in the involved site or may be asymptomatic. Many of these lesions, though uncommon, are missed or underdiagnosed at

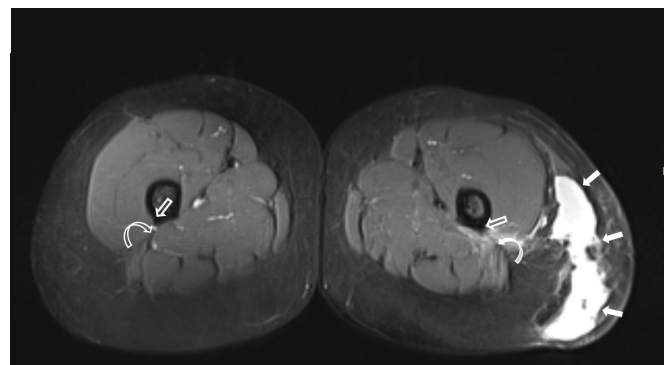
initial evaluation, especially in the presence of other severe injuries [4, 7]. Insufficient treatment due to diagnostic delay can lead to local tissue necrosis and increases the risk of infection. Although the diagnosis of MLL is usually based on clinical examination, radiologists must be aware of the radiological findings of acute and chronic lesions, as well as their therapeutic implications [7]. In the case presented, the patient was subjected to an ultrasound-guided aspiration of the collection and installation of 80 mg of triamcinolone acetonide after aspiration. She was under antibiotic cover for a period of five days following the ultrasound examination, and she was wearing compression stockings for a period of six weeks fulltime. She was being reviewed every two weeks. Substantial decrease in size and complete symptoms remission was achieved, following a period of three months.

Plain radiography may demonstrate a soft tissue swelling, as in the case presented (Fig. 4). However, MRI is the imaging modality of choice, as it can determine the relationship of the lesion with the adjacent, underlying fascia. The size and shape of these lesions varies, ranging from tiny non-encapsulated lesions to large, oval or fusiform lesions with tapering margins and surrounding thick fibrous capsule when chronic. The signal intensity of the lesion depends on the amount of blood, lymph and fat present, as well as its chronicity, however, it usually has a cyst-like appearance [5]. Melhado and Bencardino proposed a classification of MMLs based on the morphology of the lesion, the signal intensity on T1- and T2-weighted images and the presence or absence of a capsule [8]. Regarding this classification, six types of MMLs have been described. The first three types are the most frequently observed, wherein type I represents a seroma, type II a subacute haematoma, and type III a chronic organising haematoma. The other three types represent longstanding lesions; a type IV lesion is a perifascial dissection with closed fatty tissue laceration, a type V is a perifascially located pseudonodular lesion and a type VI lesion represents the infected lesion with or without sinus tract formation, internal septations and thick enhancing capsule [8, 9].

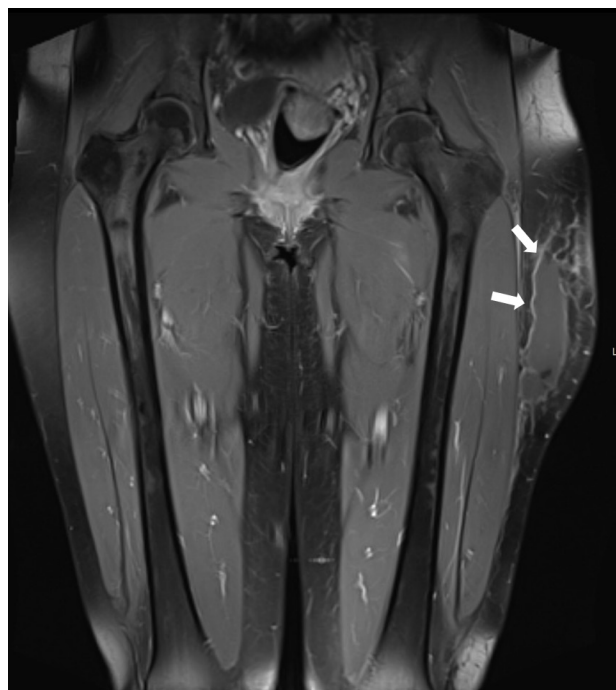
Many other entities such as fat necrosis, haemangioma, subcutaneous haematoma, soft tissue sarcoma



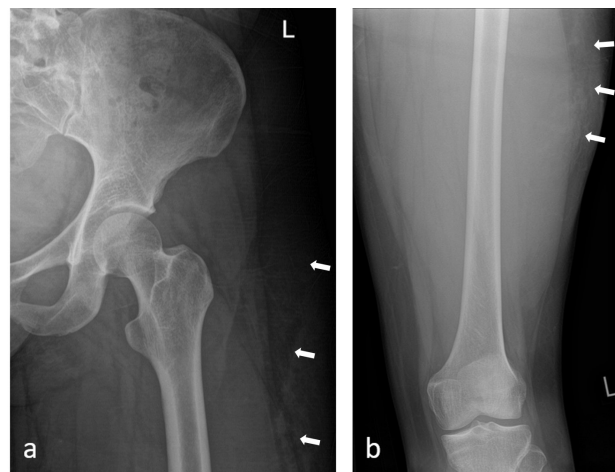
**Fig. 1.** Coronal T1W and fat saturated T2W MR images showing an 18 cm long collection within the lateral subcutaneous fat of the left thigh (arrows). Fat globules are present within the collection.



**Fig. 2.** Axial fat-saturated T2W MR image showing a 13 x 3.5 cm maximum cross-section collection (white arrows) within the lateral subcutaneous fat of the left thigh. Fat globules are visible within the collection. The left gluteus maximus distal tendon insertion appears to be avulsed (white curved arrow) from its femoral attachment on the gluteal tuberosity (empty arrow) and displaced dorsally. The contralateral insertion is shown for comparison (open curved arrow and empty arrow).



**Fig. 3.** Post-contrast coronal T1-weighted MR image demonstrating rim enhancement of the lesion (arrows). A few fat globules are visible within the inferior part of the collection.



**Fig. 4.** Anteroposterior plain radiographs: **a.** left hip, **b.** left thigh, demonstrating subcutaneous ill-defined radiodense areas (arrows) in the lateral aspect of the left thigh.

and extensive bursitis can mimic MML. History of trauma, almost typical location as well as MRI features are the main factors that should be considered in establishing the correct diagnosis [5, 6]. **R**

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### Conflict of interest

*The authors declared no conflicts of interest.*



### KEY WORDS

Morel-Lavallée; Morel-Lavallee lesion; Pseudolipoma; Organising haematoma; Post-traumatic soft tissue cyst; Thigh lesion

## REFERENCES

1. Neal C, Jacobson JA, Brandon C, et al. Sonography of Morel-Lavallee lesions. *J Ultrasound Med* 2008; 27 (7): 1077-1081.
2. Mukherjee K, Perrin SM, Hughes PM. Morel-Lavallee lesion in an adolescent with ultrasound and MRI correlation. *Skelet Radiol* 2007; 36(Suppl 1): S43-S45.
3. Kim SW, Roh SG, Lee NH, et al. Clinical experience of morel-lavallee syndrome. *Arch Plast Surg* 2015; 42(1): 91-93.
4. Takahara S, Oe K, Fujita H, et al. Missed massive morel-lavallee lesion. *Case Rep Orthop* 2014; 2014:920317.
5. Vassalou EE, Zibis AH, Raoulis VA, et al. Morel-Lavallée lesions of the knee: MRI findings compared with cadaveric study findings. *AJR Am J Roentgenol* 2018; 210(5): W234-W239.
6. Diviti S, Gupta N, Hooda K, et al. Morel-Lavallee Lesions-Review of pathophysiology, clinical findings, imaging findings and management. *J Clin Diagn Res* 2017; 11(4): TE01-TE04.
7. Kumar S, Kumar S. Morel-Lavallee lesion in distal thigh: A case report. *J Clin Orthop Trauma* 2014; 5(3): 161-166.
8. Mellado JM, Bencardino JT. Morel-Lavallee lesion: Review with emphasis on MR imaging. *Magn Reson Imaging Clin N Am* 2005; 13: 775-782.
9. De Coninck T, Vanhoenacker F, Verstraete K. Imaging features of Morel-Lavallée lesions. *J Belg Soc Radiol* 2017; 101(Suppl 2): 15.



### READY-MADE CITATION

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