Case report

Lumbar Morel-Lavallée lesion: Case report and review of the literature

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A R T I C L E   I N F O

Article history:
Received 24 September 2015
Accepted 4 January 2016

Keywords:
Morel-Lavallée lesion
Pseudocyst
Lumbar
Degloving injury

A B S T R A C T

The Morel-Lavallée lesion (MLL) is a rarely reported closed degloving injury, in which shearing forces have lead to break off subcutaneous tissues from the underlying fascia. Lumbar MLL have been rarely reported to date, explaining that patients are frequently misdiagnosed. While patients could be treated conservatively or with non-invasive procedures, delayed diagnosis may require open surgery for its cure. Indeed, untreated lesions can cause pain, infection or growing subcutaneous mass that can be confused with a soft tissue tumor. We report the clinical and radiological features of a 45-year old man with voluminous lumbar MLL initially misdiagnosed. We also reviewed the relevant English literature to summarize the diagnostic tools and the main therapeutic options.

1. Introduction

The Morel-Lavallée lesion is a rarely reported closed degloving injury, usually occurring after a blunt trauma. The resultant high-energy shearing forces separate the skin and subcutaneous tissues from the solid underlying fascia [1–3]. This creates a potential space between the hypodermal tissue and the fascia, which subsequently fills with necrotic fat, blood and lymph, resulting from the disrupted perforating blood and lymphatic vessels. It is estimated that one-third to two-third of MLL patients are overlooked, leading to delayed diagnosis and treatment [2]. When MLL is misdiagnosed, patient may present with persistent pain or growing subcutaneous mass that can be confused with a soft tissue tumor. Moreover, such necrotic tissue is particularly conductive for infection and can be colonized during incipient bacteremia associated with polytrauma or from other origin, leading to abscess, cellulitis or even osteomyelitis. Most reported cases of MLL involved the greater trochanter, the buttock, the proximal femur and the knee, while lumbar MLL have been very rarely reported [1–5]. We reported an additional case of lumbar MLL and reviewed the relevant English literature to summarize the diagnostic tools and the main therapeutic options.

2. Case presentation

2.1. History

A 50-year-old man was admitted to emergency department after a fall on his lumbar region while at work 2 years ago. He suffered from back pain but the physical examination was considered normal. All exams directed toward possible traumatic lesions were normal, including plan radiographs and CT-scan of the spine. Then, he was discharged from the emergency department with recommendations and pain medication. Since, he continued to complain of pain and paresthesia in the lumbar region, justifying repeated medical consultations. Two years later, the patient has been addressed to the rheumatologist for the treatment of chronic back pain.

2.2. Examination

Physical examination revealed a prominent local pain and fluctuation in the lumbar region that was previously overlooked and misdiagnosed as “lipoma”.

2.3. Radiological findings

Ultrasonographic examination demonstrated a well-limited hypoechoic fluid accumulation with a dense interior milieu between the subcutaneous tissue and the fascia (Fig. 1). T2-weighted sagittal and axial magnetic resonance images (MRI) showed a hyper-intense multilocular fluid collection between the subcutaneous tissue and the fascia extending from T11 to L4. The...
Fig. 1. Transverse ultrasound image at the level of L2, showing a well-limited hypoechoic fluid accumulation between the subcutaneous tissue and the fascia.

collection appeared hypo-intense on T1-weighted sequences and was strongly enhanced by gadolinium (Fig. 2). The patient was diagnosed with a soft tissue tumor, and addressed at our institution for its treatment.

2.4. Operation

History of trauma and typical location allowed evoking the diagnosis of MLL, which was confirmed by CT-guided biopsies that revealed the absence of tumor cells. Given the considerable delay and multilocular appearance on MRI, the patient underwent open debridement and drainage. The pseudo-capsule was dissected and resected to prevent further recurrence. The wide dead space required a closure in multiple layers and a suction drain was left in place during 3 days. The postoperative course was uneventful and the patient was discharged at day 5. Despite a limited follow-up, the patient was completely relieved of her pain and the collection disappeared. Histological examination revealed a benign fibrous mass, whereas cultures were negative.

3. Discussion

3.1. Pathophysiology

The Morel-Lavallée lesion is a rare condition that was first described by the French physician Maurice Morel-Lavallée in 1853. Some authors have suggested that the predilection of MLL to occur in certain regions was likely related to a variation of the anatomical structure of the adipose tissue. The deep layers have a looser structure, mainly in gluteal and thigh regions in women. These variations of subcutaneous tissues anatomy, explains why gluteal and thigh regions are most commonly involved, while lumbar region is rarely affected. All reported cases of lumbar MLL, involved young men and severe trauma (Table 1). When diagnosis and treatment are not achieved in the early phase, surrounding granulation tissue may eventually organize into a pseudo-capsule, preventing reabsorption of the content of the lesion and leading to a chronic fluid collection.

Fig. 2. Sagittal (A,C,E) and axial (B,D,F) MR images of the lumbar spine performed 2 years after the trauma. T2-weighted images (A,B) show a hyper-intense lesion between the subcutaneous tissues and the fascia (arrow). T1-weighted images (C,D) show an enhanced hypo-intense lesion (E,F).
Table 1
Literature review. Summary of main demographic, clinical and operative data of reported patients with a lumbar Morel-Lavallée lesion.

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Sex</th>
<th>Age</th>
<th>Trauma</th>
<th>Polytrauma</th>
<th>Delay*</th>
<th>Symptoms</th>
<th>Location</th>
<th>Treatment</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sawkar et al.</td>
<td>2011</td>
<td>M</td>
<td>16</td>
<td>MVA</td>
<td>Yes (resuscitated)</td>
<td>Acute</td>
<td>?</td>
<td>Lumbar</td>
<td>Aspiration</td>
<td>Good</td>
</tr>
<tr>
<td>Efrimescu et al.</td>
<td>2012</td>
<td>M</td>
<td>14</td>
<td>Fall</td>
<td>No</td>
<td>3 months</td>
<td>Mass, pain</td>
<td>Lumbar</td>
<td>??</td>
<td>??</td>
</tr>
<tr>
<td>Moran et al.</td>
<td>2012</td>
<td>M</td>
<td>20</td>
<td>Sport (soccer)</td>
<td>No</td>
<td>2 weeks</td>
<td>Pain</td>
<td>Lumbar</td>
<td>Aspiration</td>
<td>Good</td>
</tr>
<tr>
<td>Garrison et al.</td>
<td>2014</td>
<td>M</td>
<td>21</td>
<td>Sport (snowboard)</td>
<td>No</td>
<td>Acute</td>
<td>Pain</td>
<td>Lumbar</td>
<td>??</td>
<td>Good</td>
</tr>
<tr>
<td>Buyukkaya et al.</td>
<td>2015</td>
<td>M</td>
<td>18</td>
<td>MVA</td>
<td>No</td>
<td>3 months</td>
<td>Pain</td>
<td>Lumbosacral 4-5</td>
<td>Conservative</td>
<td>??</td>
</tr>
<tr>
<td>Present case</td>
<td>2015</td>
<td>M</td>
<td>50</td>
<td>Fall</td>
<td>No</td>
<td>2 years</td>
<td>Mass, Pain</td>
<td>Lumbar L1-L5</td>
<td>Open surgery</td>
<td>Good</td>
</tr>
</tbody>
</table>

MVA: motor vehicle accident.
* Delay between the trauma and the diagnosis.

3.2. Diagnosis

Early diagnosis is necessary to allow conservative or non-invasive treatment and to avoid the occurrence of infectious complications. It remains primarily a clinical diagnosis. Although, symptoms and signs are variable and elusive, friction burns and tire marks in the lumbar region, suggesting a blunt shearing injury can be clues to the diagnosis. Skin hyper mobility is another useful clinical sign, especially when the patient presents late after the trauma. Loss of cutaneous sensation over the injured area can be noticed because of shearing injury to the cutaneous nerves. Once clinically suspected, MRI is the key exam in establishing the diagnosis of MLL. Typically, these injuries present as fluid collections at the interface between the subcutaneous fat and underlying fascia, with variable aspects on MRI, mainly depending on the delay from the inaugural trauma and amount of blood, fat, and lymph tissue within it. Later the presence of a T1 and T2 hypo-intense concentric ring enhanced by gadolinium, strongly suggests the presence of a pseudo-capsule that may prevent the reabsorption of the content. Radiologists should know these MRI findings, to aid clinicians in prognostication by choosing the best therapeutic option. Moreover, the occasional gadolinium enhancement has lead radiologists to the diagnosis of soft tissue sarcoma as in our case. Our case is remarkable in that it shows that the radiological aspect can be highly misleading in cases diagnosed very late. Indeed, heterogeneous aspect and significant contrast enhancement can be encountered in various tumor types. Characteristic location and history of trauma may help in distinguishing MLL from a neoplasm.

3.3. Treatment

Because of the rarity of this entity, there is no available treatment consensus. It is currently admitted that conservative management followed by close monitoring can be reasonably proposed in the acute phase for lesions of limited size. Simple compression, activity cessation and/or rest should suffice in such situations. For extensive lesions, or not responsive to conservative treatment, a needle aspiration can be proposed. In our literature review of lumbar MLL, treatment modalities and outcomes have been reported is a limited number of cases. Among them, 3 patients benefited from aspiration (unknown volume) with good outcome. However, it should be noted that large lesions have a significant tendency to recur. In refractory cases, doxycycline and talc sclerosis have been successfully employed. When diagnosed late, the presence of a thick capsule does not allow hoping for a spontaneous healing. Similarly, percutaneous treatments have not proven to be effective to date. Surgery is still recommended in such cases, to relieve symptoms and to avoid the occurrence of infectious complications.

4. Conclusion

Lumbar MLL has been rarely reported and is still largely misdiagnosed. Physicians should be aware of this entity, as prompt diagnosis is required to allow efficient conservative or non-invasive management. In case of delayed diagnosis, open debridement, albeit more invasive, results in good outcome.

Disclosure of interest

The authors declare that they have no competing interest.

References