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Morel-Lavallee Lesions: A Non-Operative Case Series

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ABSTRACT

In the late 1800's, Morel-Lavallée described a pattern of injury to the proximal thigh involving a fluid collection associated with a de-gloving type of injury. These injuries typically result from blunt trauma and falls. There is existing literature that suggests surgical management as primary treatment, although no rigorous controlled trials are found in English language medical literature. Non-surgical aspiration with sclerodesis is an option, however individual case reports suggest that using multiple aspirations without sclerodesis could be effective. This series illustrates that nonsurgical management (i.e. aspiration without sclerodesis) is a viable option for these injuries.

Keywords: Morel-Lavallée, seroma, thigh injury, degloving, ultrasound, aspiration

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INTRODUCTION

Soft tissue swelling and masses are common problems facing the sports medicine clinician. Most commonly, the post-traumatic soft tissue swelling represents a hematoma, for which conservative management is the standard of care. Other possibilities include angiomatous masses, seromas, fascial ruptures with varying degrees of herniation of deeper tissue, or tumors and unrelated masses (e.g. lipomas, sarcomas or other non-traumatic tumors) made more apparent or noticeable because of the pain associated with the trauma. One seroma-like injury recognized in early medical literature that doesn't receive much attention is the Morel-Lavallée lesion, typically resulting from a de-gloving injury separating the subcutaneous tissue from the myofascial layer. This injury then subsequently produces seromatous fluid collections that can last much longer than typical hematomas. We present four cases successfully treated by repeat aspirations without medication or surgical interventions.

PATIENT 1

A 38 year old male presented to a primary care clinic for left thigh swelling following a motor vehicle accident 5 days prior. He was hit by a car while riding his motorcycle, and slid several meters with his left leg trapped under the motorcycle. He had been evaluated in the ED following the accident, with negative radiographs of the left leg from the pelvis to foot. He subsequently developed bruising with progressive swelling of the left thigh. He experienced pain at the site of injury without numbness or paresthesias.

His initial exam after the accident demonstrated bruising over a 10x15cm area of fluctuant swelling on the proximal lateral left thigh. He had full ROM and sensation of the left leg with tenderness to palpation overlying the area of swelling. He was diagnosed with a hematoma and instructed to return to clinic in 3-5 days.

On follow up examination, the original area of concern remained fluctuant and with increased

pain and swelling. The patient was referred to our Sports Medicine clinic with the area of swelling measured to be 15x15cm. Ultrasound imaging was performed which revealed an anechoic fusiform collection of fluid between the deep subcutaneous fat and muscular fascia. (Figure 1) Multiple hyperechoic areas of debris were also visualized during the scan.

The patient's mechanism of injury and ultrasound imaging were consistent with that of a closed de-gloving injury, also known as a Morel-Lavallée lesion. A discussion was had with the patient regarding the nature of his injury, and the differing approaches to management. Compression, fluid aspiration, and open surgical debridement with drain placement were discussed, with the patient preferring fluid aspiration in-office. He was informed about the likelihood of recurrence after aspiration, but he expressed it to be his preference. At his first visit to our clinic we aspirated 140 ml of serosanguinous fluid using ultrasound guidance with an 18-gauge needle under local anesthesia with 1% lidocaine. Afterwards a compressive ACE bandage was wrapped around the drained fluid collection and the patient was instructed to follow-up four days later. At his second visit, the fluid had re-accumulated but demonstrated less swelling than previously, and a similar discussion was had regarding treatment options. He preferred fluid aspiration. Using the same technique as the first aspiration, 110ml was drained from the lesion, and he was reminded to continue compression of the thigh. At his third appointment the fluid collection was again present, but markedly reduced, with only 45 ml aspirated from the site. The patient continued to prefer sequential aspiration over surgical intervention, and returned to clinic 4 more times at similar 3-4 day intervals, with 32 ml, 8 ml, and 6 ml drained at those visits, with the last visit demonstrating resolution of the lesion and his pain, so no aspiration was performed. The patient was seen in our clinic a total of 8 times over the course of one month, with 7 fluid aspirations performed. More than 3 months have

passed in which he has not returned to clinic for recurrence of his symptoms.

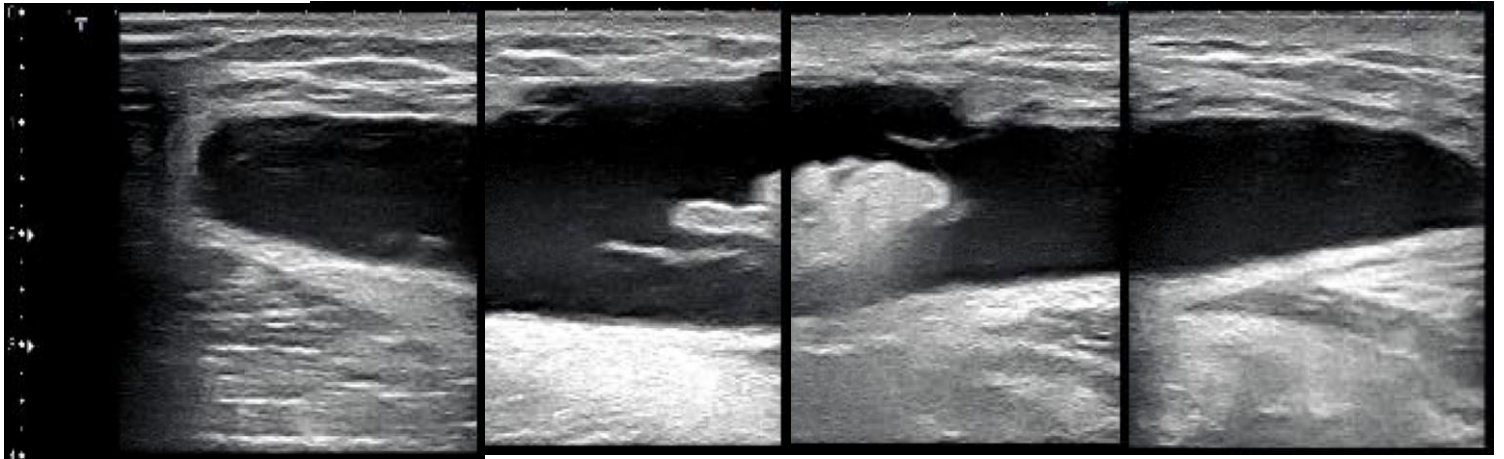


Figure 1. Patient 1 prior to aspiration with large seroma

Patient 2

A 22 year old female presents after having a large tractor tire fall on her right medial thigh during advanced workouts at a gym. She resumed her workout after the injury, but the next morning she noticed extensive ecchymoses and swelling of the distal medial right thigh. No knee or hip pain. Ibuprofen helped reduce her pain, however over the following two days she was unable to ambulate normally because of swelling and pain. She had no neurologic complaint.

On examination, she walked with a slight limp favoring the right side. A large ecchymosis was noted on the medial right thigh superior to the knee, as well as a superficial abrasion measuring 4 x 2.5cm. Substantial soft tissue swelling was appreciable localized to medial distal thigh and was moderately tender. She had full range of motion of the knee with a normal ligamentous exam. Strength was grossly intact as was her neurovascular exam.

Ultrasound examination showed a fluid collection in the medial thigh, measuring 8cm x 4cm. Needle aspiration was suggested, but the patient wanted to discuss with her parents. She returned 2 days later using compressive wrap but wanting to proceed with aspiration. This was performed under US guidance and 34 ml of serosanguinous fluid was aspirated (Figure 2).

Post-aspiration US showed near elimination of the fluid.

She continued the compressive wrap and returned 5 days post aspiration. US showed some reaccumulation. One week later US was repeated without significant change and the patient wanted to delay repeat aspiration. Another week later, repeat US showed persistence of the fluid to about 25% of its maximum and repeat aspiration was performed using 18 gauge needle resulting in 21 ml of serosanguinous fluid.

12 days after the second aspiration, repeat US showed small amount of fluid recollection. Another 10 days later, a third aspiration of a stable US seroma resulted in 4 ml of serous fluid using 18gauge needle. 14 days later (approximately 8 weeks into the course of treatment) she returned stating pain had finally resolved but she had not returned to full activity as she was worried about recurrence. US showed small seroma, but she was encouraged to gradually resume all desired activities. If recurrence happened, consideration for sclerosing agent was discussed.

She experienced no problems or recurrence, but she returned 2 months later for an unrelated problem. Her right thigh was still pain free, and she was participating fully in her preferred activities (boot camp and bike riding).

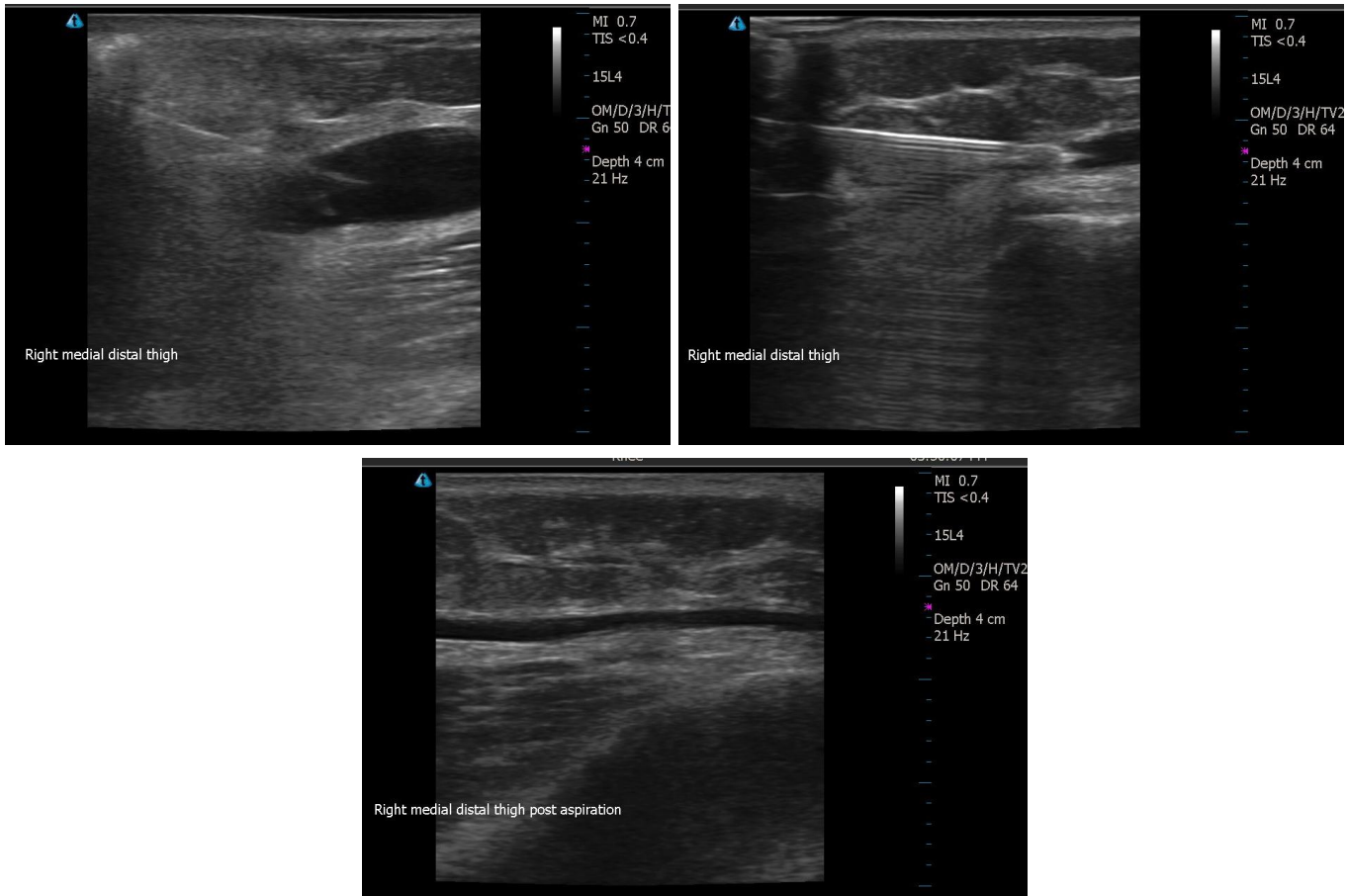


Figure 2. A: Patient 3 during aspiration. B: Nearing completion of aspiration. C: Post-aspiration.

Patient 3

A 20 year old female presented with a 5-month history of left posterolateral thigh pain. She was involved in an accident during which she fell off a scooter going 20mph. She believes she landed directly on the left thigh and buttock. She used ace wraps, ibuprofen and icing for the acute swelling and believed she had recovered within 6 weeks after this injury. At the time of presentation she was still having pain with pressure to the posterolateral thigh, pain at night, and difficulty returning to full activities like running and martial arts. No numbness or tingling. She had no prior injury to this area.

On examination, she had ecchymoses in various stages over the left posterior thigh. There was tenderness posterior to the greater trochanter. She had full range of motion of both hips and knees and was found to have good overall lower extremity strength without deficits. Plain radiographs of the pelvis and left hip revealed no

bony abnormalities, so she was referred to physical therapy to address potential gluteal chronic tendinopathy.

She returned to our Sports Medicine clinic about 6 weeks later. Over the collegiate break week, she was seen at home and a corticosteroid injection was done by an orthopaedist. This seemed to reduce the swelling but did not change the level of pain or functional ability. Examination at that time was unchanged other than the mass was more apparent distal to the left greater trochanter. An MRI was ordered which showed a 6x9cm seromatous collection corresponding to the soft mass appreciated on exam. She returned 2 weeks later and underwent ultrasound guided aspiration using 18 gauge needle. A small amount of bloody fluid was aspirated even after redirection of the needle. Of note, the size of the seroma seemed much smaller than what was reported on MRI.

Several months later she returned with recurrent swelling in the same location after resuming Brazilian jujitsu. She had minimal tenderness but palpation did reveal a recurrence of a small soft mass in the posterior left thigh. Using ultrasound guidance, a small amount of serous fluid was aspirated at that time, and cortisone was injected into the space. Two weeks later repeat US revealed a persistent seroma, but decreased in size. Surgical consultation was discussed, however it was decided to continue conservative management by adding compressive antifriction shorts (like soccer goalie shorts or baseball 'sliding' shorts) as she continued her martial arts practice.

Approximately 2 months later, she was evaluated for an unrelated problem. At that time, US showed no evidence for seroma in the left posterior thigh.

Patient 4

A 20 year old male presented with left posterior thigh pain after falling against the hard edge of a wooden chair 12 days prior. He noticed swelling

so he tried massage therapy but kept running daily as he was an elite distance runner. As the swelling continued to worsen, he was seen by an orthopaedist and an MRI was obtained. This showed a large seromatous lesion, and the patient was referred to our Sports Medicine clinic. After confirming the lesion on ultrasound, a 20 gauge needle was used to aspirate 100 ml of serous fluid (Figure 3). Post-aspiration US revealed near-complete collapse of the lesion. Compressive wrap applied and he was told to rest for 3 days.

The patient returned in 4 days and repeat US showed the lesion to be approximately 5-8% of its prior size. At that point he was advanced to light biking and jogging, with intent to run in one week. Repeat US in one more week showed a very small remnant, judged to have <5 ml. He was pain free with all activities, but had not advanced to running. That day he ran two miles without incident. He eventually returned to all activities without pain or recurrence of the swelling.

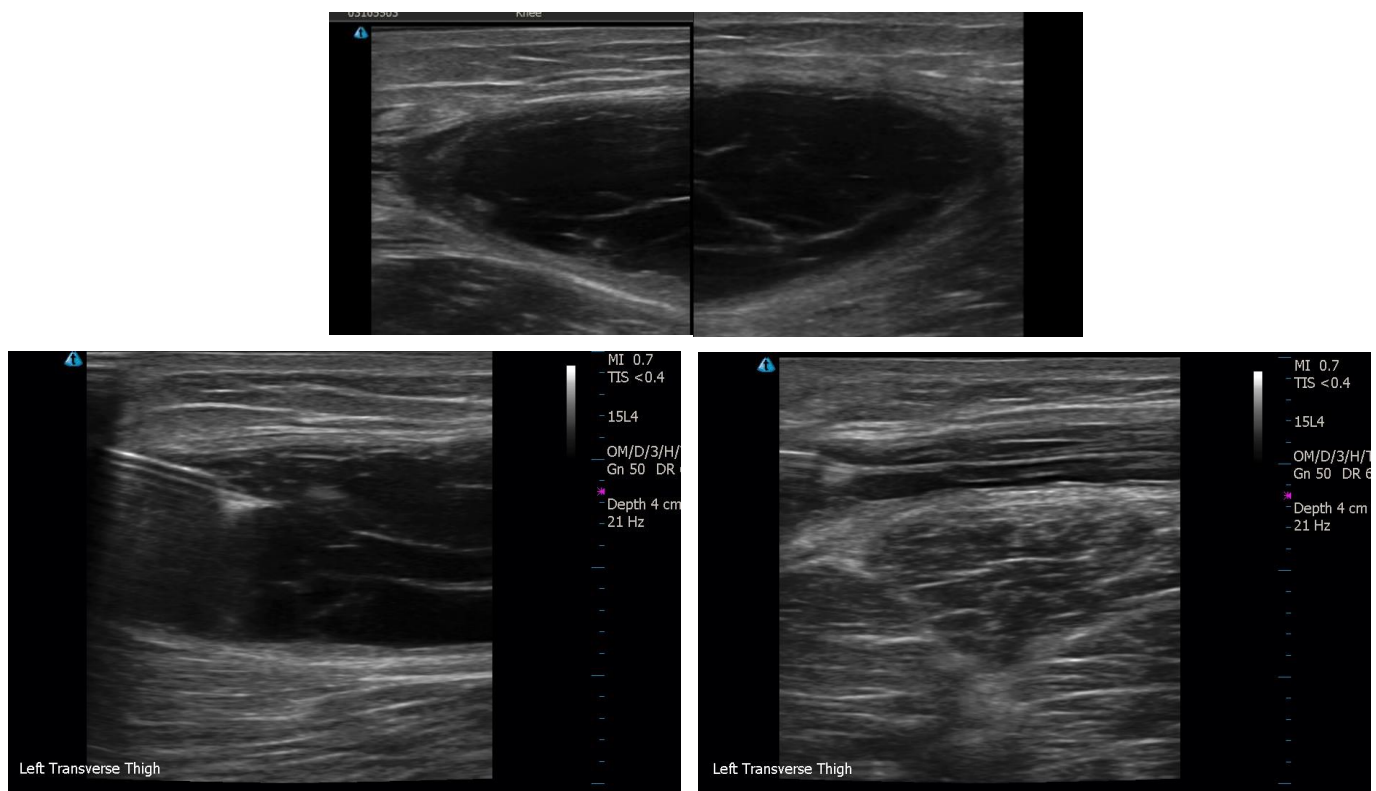


Figure 3: Patient 4 A: Axial sonography of lesion pre-aspiration. B: Longitudinal oblique image during aspiration. C: Longitudinal oblique at the end of aspiration.

DISCUSSION

Morel-Lavallée lesions, also known by terms such as “closed internal degloving injury,” “Morel-Lavallée effusion” and “Post traumatic Morel-Lavallée Seroma” were first described in the second half of the 19th century by Morel-Lavallée [1, 2]. Originally observed as posttraumatic injuries to the proximal thigh, these lesions can be found in other areas of the body. A literature review by Vanhegan et al in 2012 of 29 articles found that >50% of 204 lesions occurred in the region of the thigh or greater trochanter/hip, with other major locations including the pelvis, knee, and gluteal regions [1, 3]. Motor vehicle collisions are the most common cause of injury leading to the formation of Morel-Lavallée lesions [1, 2, 4]. They are manifested as a collection of serosanguinous fluid at the interface of subcutaneous tissues and deep fascia. Most often a shearing mechanism of injury causes damage to blood and lymphatic vessels that perforate the deep fascia, leading to the formation of a seroma or hematoma in a posttraumatic potential space. The timing in which these fluid accumulations develop is variable, ranging from a matter of hours to even days, months and years [2,5,6].

Clinical presentations of Morel-Lavallée lesions can vary, though common features include swelling and pain over the area of injury with associated bruising and abrasions, in addition to fluctuance appreciable on palpation. Some patients may experience decreased sensation of the skin overlying the lesion, and may even present with symptoms similar to that of a deep vein thrombosis [7, 8]. Correctly identifying Morel-Lavallée lesions when they occur is critical, due to the potential for significant morbidity – including tissue necrosis, infection, and nerve damage. [7]

Several imaging modalities may be employed in the diagnosis and management of Morel-Lavallée lesions, including MRI, CT, and ultrasound. Many sources cite MRI as the modality of choice for lesion characterization, though ultrasound has demonstrated both

efficacy and utility in clinical practice [1, 2, 8, 9]. MRI findings vary depending on the age of the lesion, those that are hours to days old often appearing hypointense on T1 weighted images, and those that are weeks old often appearing hyperintense on T1 WI [5,9,10]. Ultrasound visualization likewise may vary from anechoic to hyperechoic with various debris including hematogenous and adipose tissue inside the cavity of the lesions [5].

As with choice of imaging, a range of options exists for treatment of these lesions [11]. These options include conservative treatment with compressive wrap, percutaneous drainage, injection of sclerosing agents such as talc and doxycycline, closed surgical drainage, and for chronic lesions that have developed capsules, complete surgical excision of the lesion. There is not currently an established standard of care for treatment, although Mayo Clinic in 2014 published a paper seeking to establish management guidelines [2].

OUTCOME and CONCLUSIONS

After successive aspirations of the Morel-Lavallée lesions, our patients experienced resolution of the pain, swelling, and fluid accumulation for which they presented. These cases suggest repeat fluid aspiration without sclerodesis as a viable treatment option for small to moderate-sized Morel-Lavallée lesions, especially for circumstances in which patient preferences, cost, and access to more invasive measures may be limiting factors. Based on the authors experiences and the outcomes presented here, it seems reasonable to treat Morel-Lavallée lesions with simple ultrasound-guided aspiration, and expect weekly or biweekly repeat aspirations until the amount of fluid collection is minimal. None of these four needed talc or doxycycline injection to return to full activity, however all lesions were less than 150 ml. These cases also highlight the utility of point-of-care ultrasound for persistent or progressive post-traumatic soft-tissue swelling, particularly in situations with a de-gloving mechanism of injury.

References

- 1 Bonilla-Yoon, I., Masih, S., Patel, D.B. et al. "The Morel-Lavallee lesion: pathophysiology, clinical presentation, imaging features, and treatment options," *Emerg Radiol* (2014) 21: 35. doi:10.1007/s10140-013-1151-7
- 2 Nickerson TP, Zielinski MD, Jenkins DH, Schiller HJ. The Mayo Clinic experience with Morel-Lavallée lesions: establishment of a practice management guideline. *J Trauma Acute Care Surg* 2014;76:493-7.
- 3 Vanhegan IS, Dala-Ali B, Verhelst L, Mallucci P, Haddad FS (2012) The Morel-Lavallee lesion as a rare differential diagnosis for recalcitrant bursitis of the knee: case report and literature review. *Case Rep Orthop* 2012:593193
- 4 Parra JA, FernandezMA, Encinas B, RicoM(1997) Morel-Lavallee effusions in the thigh. *Skelet Radiol* 26(4):239–241
- 5 Mellado JM, Bencardino JT. Morel-Lavallée lesion: review with emphasis on MR imaging. *Magn Reson Imaging Clin N Am*. 2005;13(4):775Y782.
- 6 Hudson DA. Missed closed degloving injuries: late presentation as a contour deformity. *Plast Reconstr Surg*. 1996;98(2):334Y337.
- 7 Scott LaTulip, Rameshwar R. Rao, Alan Sielaff, Nik Theyyunni, and John Burkhardt, "Ultrasound Utility in the Diagnosis of a Morel-Lavallée Lesion," *Case Reports in Emergency Medicine*, vol. 2017, Article ID 3967587, 3 pages, 2017. doi:10.1155/2017/3967587
- 8 Diken AI, Yalçinkaya A, Ipek D. An extensive Morel-Lavallée lesion mimicking deep vein thrombosis. *Cardiovasc Surf Int* 2015;2(3):69-71
- 9 Bomela LN, Basson H, Motsitsi NS. Morel-Lavallée lesion: A review. *SA Orthopaedic Journal* 2008;7(2):34-41.
- 10 Mellado JM, Perez Del Palomar L, Diaz L, Ramos A, Sauri A. Long-standing Morel-Lavallee lesion of the trochanteric region and proximal thigh; MRI features in 5 patients. *American Journal of Roentgenology* 2004;182:1289-94.
- 11 Singh R, Rymer B, Youssef B, Lim J. The Morel-Lavallée lesion and its management: a review of the literature. *Journal of Orthopaedics*. 2018;15(4):917-921.

