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Case report

Endoscopic debridement and fibrin glue injection of a chronic Morel-Lavallée lesion of the knee in a professional soccer player: A case report and literature review

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ABSTRACT

A Morel-Lavallée lesion is a post-traumatic closed degloving injury of soft tissue. The lesion is due to a shearing trauma with separation of subcutaneous tissue from underlying fascia. When conservative treatment fails, surgical treatment is imperative. Commonly, open drainage and debridement is performed. This case report describes a Morel-Lavallée lesion of the knee in a professional soccer player who was successfully treated with endoscopic debridement and fibrin glue injection after failure of conservative management. This method achieves the goal of an open surgical debridement without exposing patients to an increased morbidity.

1. Introduction

A Morel-Lavallée lesion (MLL), first described in 1863 by Maurice Morel-Lavallée, is a post-traumatic closed degloving injury of soft tissue [1]. The lesion is due to shearing blunt trauma with disruption of perforating blood vessels and separation of subcutaneous tissue from underlying fascia. The potential space created becomes filled with blood, lymph and necrotic fatty tissue. Without treatment the lesion causes pain and persistent swelling.

The conservative treatment includes aspiration, elastic compression bandaging and sclerotherapy [2–5]. However, when conservative treatment fails, more than 50 mL fluid is aspirated, or when the lesion is encapsulated, surgical treatment is recommended [6–8]. Commonly, open drainage and surgical debridement of necrotic tissue is performed [9]. Although this aggressive approach is effective, it is not practical for the elite contact athlete who desires expeditious return to play with minimal residual functional deficit.

In this report, we describe a MLL of the knee which was successfully treated with endoscopic debridement and fibrin glue injection. This method achieves the goal of an open surgical debridement without exposing patients to an increased morbidity. Furthermore, a postoperative revalidation program is proposed.

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2. Case report

A 33-year-old professional soccer player was referred to our institution with a seven-month history of pain and swelling of the right knee. The pain and swelling were reported to have arisen after a sliding during a soccer game, in which he hit the ground with the medial side of his right knee. Magnetic resonance imaging (MRI) performed in the referring hospital, showed a well-circumscribed hematoma between the caudal portion of the vastus medialis muscle and subcutaneous fat (Figure 1). The patient was conservatively treated with compressive wrapping, aspiration of >50 mL fluid and doxycycline sclerodesis. However, no complete remission of pain and swelling was obtained. The patient then presented at the Zuyderland Medical Centre with mild pain and a fluctuating swelling of three by three centimeters on the medial side of the right knee. The total range of flexion was 110° and the Knee Society Score (KSS) was 77. Plain radiographs showed no osseous abnormalities. Ultrasound (US) revealed a thick walled, anechoic cystic mass between the caudal portion of the vastus medialis muscle and subcutaneous fat (Figure 2). The intralesional hyperechoic, lobulated projections were defined as entrapped fat globules. The diagnosis of a suprapatellar MLL of the right knee was made. The patient underwent endoscopic debridement followed by fibrin glue injection (Tissucol Duo®, Baxter, Utrecht, The Netherlands).

In brief, with the patient under spinal anesthesia, two small incisions were created for the introduction of the endoscope. The cavity was firstly irrigated with 20 mL saline to loosen the hematoma within the lesion. The thick capsule to the muscle fascia was then identified and removed with special care leaving the superficial capsule intact in order to prevent skin perforation and necrosis (Figure 3). Fluid and capsule were sent for microbiological cultures. At the end of the procedure a suction drain was inserted and 10 mL of fibrin glue (the original thrombin component of 500 IU/mL was diluted in $CaCl_2$ (20 mM) to five international units per milliLiter) was injected. This was immediately followed by the application of a compressive bandage. The suction drain was activated 30 min after injection of fibrin glue. One week postoperatively, the drain was removed as it produced less than 20 mL/24 h. A revalidation program was followed (Figure 4) with the patient returning to his sport activities six weeks after surgical treatment and a KSS of 100. No postoperative complication occurred. The microbiological cultures were negative. US performed six weeks postoperatively confirmed complete remission of the lesion (Figure 5). Currently, one year after surgical intervention the patient has no complaints about pain or swelling due to MLL of the knee.

3. Discussion

Morel-Lavallée lesions have typically been described around the thigh in association with pelvic and acetabular fractures. Tseng and Tornetta reported 1.7% of patients with a pelvic fracture to have a concomitant MLL [10]. The incidence of MLL around the thigh is probably higher than 1.7% since MLL can occur without pelvic fractures. MLLs involving the knee are less common. Vanhegan et al. reviewed 204 MLLs and reported the frequency per site as: pelvic 69.1%, knee 15.7%, gluteal 6.4%, lumbosacral 3.4%, abdominal wall 1.5%, lower leg 1.5%, head 0.5% and two percent unspecified [11].

Although MLLs are a rare cause of pain and swelling of the knee, it should be suspected in shearing blunt trauma. The swelling is characteristically of rapid onset, resulting in anterior fluctuant collections extending into the suprapatellar area [6]. The diagnosis of MLL can be confirmed with MRI or US. Thereby, MRI is considered the diagnostic imaging modality of choice. Recently, US has been recognized as a useful adjunct to and potential replacement for MRI in the diagnosis and monitoring of MLLs [12]. On US MLLs are more homogeneous and flat or fusiform in shape with a well-defined margin as the lesions aged. All MLLs are hypoechoic or anechoic, compressible and located between the deep fat and overlying fascia [13]. Without further intervention, the lesion causes pain, inflammation, persistent swelling and infection [14].

Currently, no universally accepted treatment algorithm for the management of MLLs exists. Previous studies reported that acute and subacute (<3 weeks old) MLLs that are not encapsulated could be treated conservatively [2–6]. The conservative

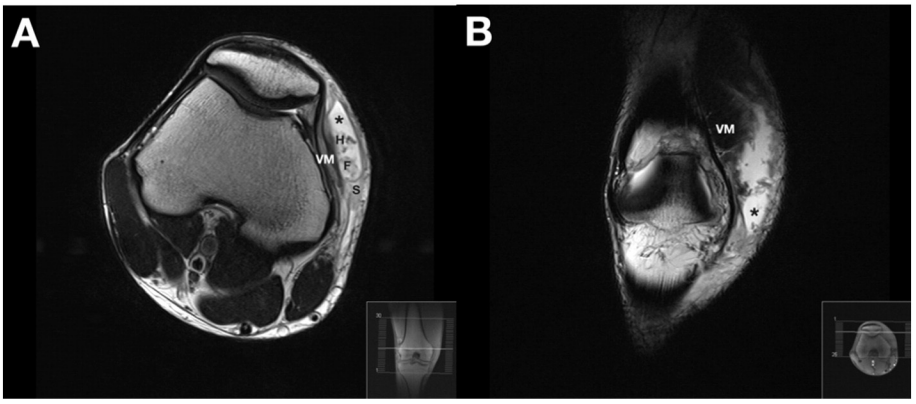

Figure 1. T2-weighted axial (A) and coronal (B) MRI of the right knee showing a high signal cystic mass (*) containing low signal intensity areas consistent with hemosiderin deposits and lobulated moderately high signal components reflecting fat globules. There was no damage to the vastus medialis muscle to report. Abbreviations: F, fat globules; H, hemosiderin deposit; S, subcutaneous fat; VM, vastus medialis muscle.

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