



Giant post-traumatic cyst after closed degloving injury

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SUMMARY

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Post-traumatic cysts of soft tissue usually occur at the junction of the subcutaneous fat and deep fascia, most often filled with serosanguinous fluid and lined with fibrous tissue. It appears as complication after closed degloving injuries when crushing and shearing forces cause separation of the skin and subcutaneous fat from the deep fascia and muscle, creating a cavity filled with hematoma and liquefied fat. This rare condition calls Morel-Lavallee lesion, which was first described by this French physician in 1853. Unrecognized injuries will evolve in cystic formation filled with serous fluid. Predestined regions of body for this kind of trauma are trochanteric, proximal thigh and ischiolumbal, most often associated with a pelvic girdle fracture. Long-standing Morel-Lavallee lesion may either remain stable or occasionally expand and can induce chronic pain. Sometimes, it is hard clinically to distinguish chronic cyst from cystic-tumor formation. Magnetic resonance imaging is the modality of choice for detection and revealing the exact size and location of these lesions. The best method of treatment is surgical excision with complete resection.

Key words: Cysts; Soft Tissue Injuries; Polytrauma; Thigh; Diagnosis; Surgery

INTRODUCTION

Post-traumatic cysts (1) are well known entity that can arise after blunt, low or high velocity crush trauma in parenchyma organs, brain, bones and soft tissues. They often become as a result of chronic organizing hematoma. In the soft tissues, cysts are usually occurred after closed degloving injury (2,3), caused by forces of pressure and shear stress at the borders of subcutaneous tissue to the muscle fascia or bone. The space thus created is initially filled with blood, lymphatic extravasations and liquefied necrotic fat. This kind of injury is referred to as a Morel-Lavallee lesion (4,5). It commonly appears about the hip region, especially over the great trochanter. In the majority of causes is associated with a pelvic girdle trauma (6,7). Early surgical approach with percutaneous drainage, washing, irrigation and compression bandaging is a method of choice for these lesions (7-9). Unrecognized injury can evolve in serous cystic formation lined with fibrous tissue (10).

CASE REPORT

A female patient, 52 years old, was admitted to the Department of plastic and reconstructive surgery, Institute of Surgery, Clinical Center-Novı Sad. She was complaining on chronic pain of right hip, especially during walk with decreased range of motion. Patient's history commenced two years ago, after the polytrauma (falling from height) with associated injuries, including fracture of the pelvic girdle and distal forearm, compressive vertebra fracture TH 11-12, hemorrhagic shock and multiple contusion of abdomen and thoracic wall. Closed degloving injury of the right thigh was initially missed. Several months later, fluctuated lesion was detected with mild progressive enlargement during the time. The tumor-like formation was localized between subcutaneous tissue and deep fascia and was propagated proximal from ischiolumbal to distal trochanteric and thigh region. On the distal part, the skin becomes thin because of the gravitation pressure of the tumor. The presence of a soft fluctuant area was the hallmark physical finding with decreased cutaneous sensation. The patient did not have a history of anticoagulation or bleeding diathesis.

The magnetic resonance (MR) images revealed fusiform formation with well-defined margins. The lesion was 26 cm long (Figure 1a) and its widest diameter was 9 cm (Figure 1b), appeared to be contained in the deep subcutaneous and perifascial space in the proximal part, generating a palpable bulge or compressive deformity on underlying muscles. In the distal part become superficial, thinning and herniating the skin at the level of proximal femoral

region. When compared with skeletal muscle, the lesion was hyperintense and homogeneous without internal septa. A complete capsule was defined as a distinct hypointense peripheral ring visible in at least two imaging planes and conspicuous on most MR images. Such findings closely correlate with encapsulated waterlike fluid, in this case seroma. This probably accounts for the long-standing nature of the lesion (10-15).

Surgical excision with complete resection of cyst had been performed. Cyst was filled with serous fluid and had thin capsule. During the operation, just beside the distal part of cyst capsule, there were found palpable lump that was also resected and sent to histopathology department. The wound was closed with simple multilevel interrupted sutures. Vacuum drainage was removed fifth day and sutures two weeks after surgery. During first month after surgery, moderate seroma formation had been evacuated several times. After that no further leakage had been noticed, which was confirmed with ultrasound examination. Control clinical examination, 3 months after surgery showed normal physical status with full range of motion, without pain, swelling or recidivism. Histopathology showed cystic cavity situated in the deep subcutaneous fat tissue, with the wall from dense hypocellular fibrous tissue without recognizable epithelial lining and with reaction of giant cells in surrounding (Figure 2). In the second specimen which was lump found near the distal part of the cyst, histological findings showed encapsulated fat necrosis with well-preserved outlines of nonnucleated adipocytes, totally or nearly totally surrounded by thin, fibrous tissue, with sporadic degenerative changes, including dystrophic calcifications (Figure 3) (16,17).

DISCUSSION

There are only a few scientific papers about this kind of lesion in literature. This rare condition was very often neglected in the early stage of expansion when the treatment is much easier to achieve. The diagnosis of closed degloving injuries was missed at initial assessment in one-third of patients (1,5). Early complications of unrecognized trauma that can occur are infection and delayed – secondary skin necrosis due to prolong tissue hypoxia and acidosis. Left untreated, the inflammatory process can increase the degree and amount of injury to the soft tissues (2).

In the later stage, these lesions can resolve spontaneously, but in some cases can persist and change in pseudocystic formation. Long-standing

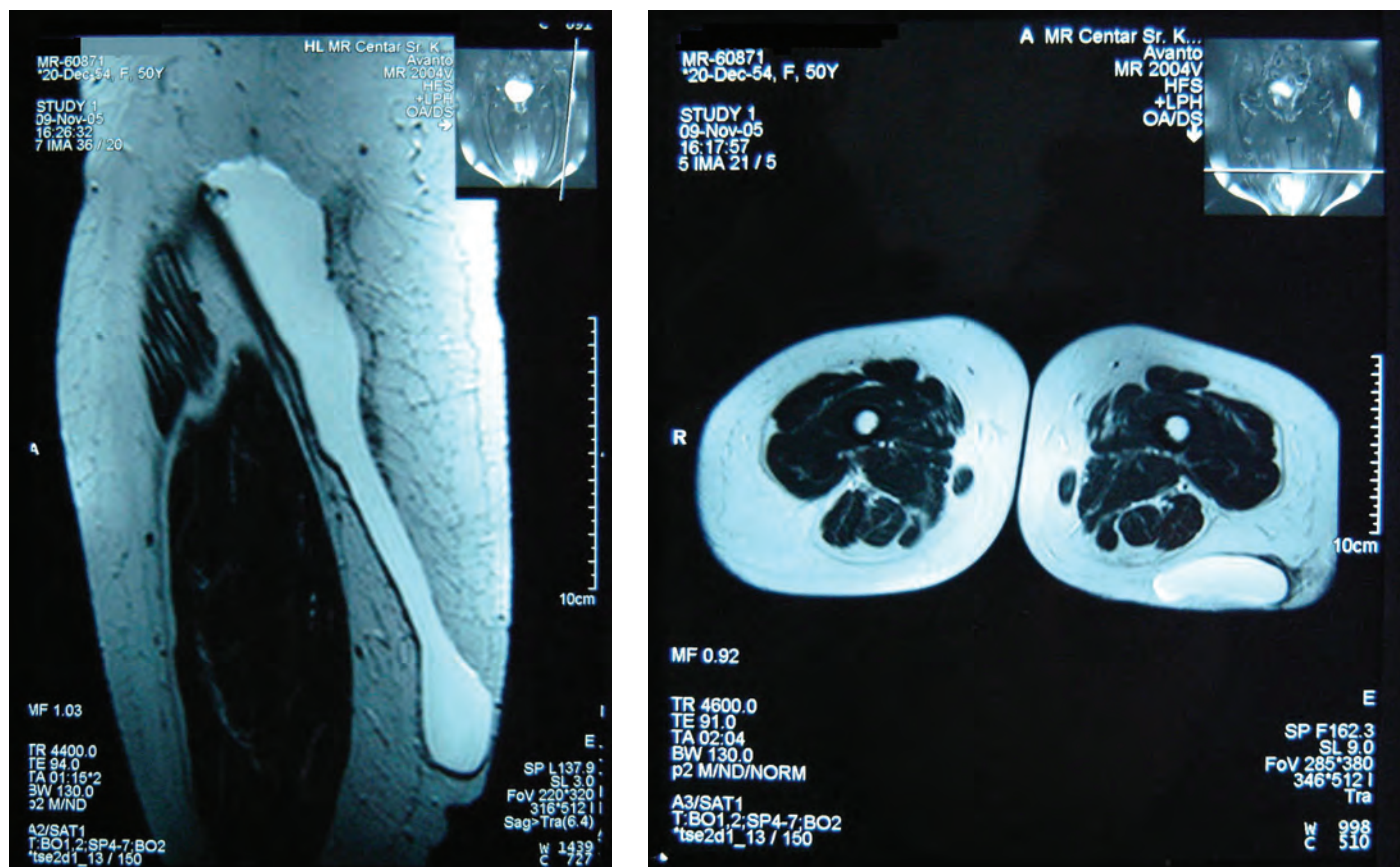


Figure 1a,b. Coronal (a) and axial (b) MR images of the cyst, with the irregular shape and largest diameter 26x9 cm. Upper pole contained in the deep subcutaneous and perifascial space while the lower pole become superficial, thinning and herniating the skin

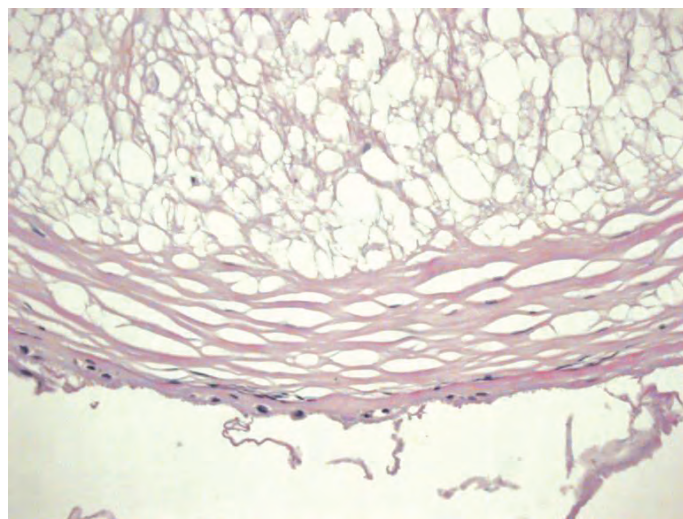


Figure 2. Histopathological specimen of cystic cavity wall from dense hypocellular fibrous tissue without recognizable epithelial lining and with reaction of giant cells in surrounding. (Magn. 1x200)

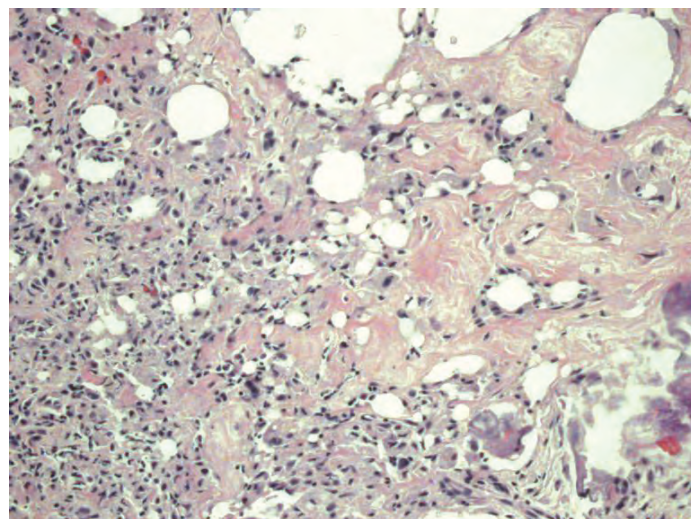


Figure 3. Histopathological specimen of fat necrosis showed well-preserved outlines of nonnucleated adipocytes, totally or nearly completely encapsulated by thin, fibrous tissue, with sporadic degenerative changes, including dystrophic calcifications. (Magn. 1x200)

Morel-Lavallee lesion had usually become as a result of chronic lymphatic extravasations and proliferate phase of healing, with fibroblasts and endothelial cells migrating into the injury site, forming epithelial border to the healthy tissue (1,2,4,7).

The subcutaneous fat is prone to trauma or ischemia. Fat necrosis arises due to multiple local or systemic events causing a compromise in the blood supply of the subcutaneous tissue. Its pathogenesis seems to be related to

ischemic changes secondary to previous trauma. Encapsulated fat necrosis is a well-defined entity even though several names have been proposed for this condition, including mobile encapsulated lipoma, encapsulated necrosis, or nodular-cystic fat necrosis (18,19). Beside trauma, there are many systemic diseases that can produce this condition such as lipodermatosclerosis, erythema nodosum, necrobiosis lipidica, sclerosing panniculitis, nodular vasculitis, complication of pancreatic disease and etc (20,21).

Prolong Morel-Lavallee lesion can expand during the time, with enhancing clinical symptoms such as increasing chronic pain and decreasing range of motion which makes surgical treatment inevitable.

Conflict of interest

We declare no conflicts of interest.

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