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Musculoskeletal

Chronic expanding hematoma of the left flank mimicking a soft-tissue neoplasm

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ABSTRACT

Soft-tissue hematomas are a common clinical entity often associated with trauma, surgery, and bleeding disorders. In the majority of cases, soft-tissue hematomas acutely appear and spontaneously resolve, but sometimes, they present as swellings that slowly expand and progressively increase with time.

We present a case of a 70-year-old man with chronic expanding hematoma of the left flank without any history of recent trauma or other medical disease.

The diagnosis could not be confirmed on imaging features alone, so the patient was taken to surgery for open biopsy and excision.

In patients with slowly growing extremity masses without recent trauma or chronic medical disorders, the differential diagnosis becomes challenging, and chronic expanding hematoma should be considered in addition to soft-tissue sarcomas and other malignancies.

Introduction

"Chronic expanding hematoma" (CEH) is an uncommon clinical entity described for the first time by Reid et al. as an organized blood collection that increases in size for more than a month after the initial hemorrhagic event [1].

In the majority of cases, soft-tissue hematomas present acutely and resolve spontaneously, but sometimes present as swellings that slowly expand. In such cases, CEH can be mistaken for a soft-tissue neoplasm [2].

In the literature, it has been reported that malignant soft-tissue sarcomas have been misdiagnosed and treated as hematomas because of the possible similarity of case histories [3].

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On the other hand, patients often note a growing soft-tissue mass after a minor traumatic event, misleading the trauma as the cause [4].

It is important to have a precise diagnosis when dealing with a soft-tissue growing mass and to exclude any malignancy before processing any treatment.

Case report

A 70-year-old man presented at our emergency department with a huge, painful soft-tissue mass in the left flank.

Twenty years ago, the patient suffered a trauma to the abdominal wall and noticed a swelling in the same area, but ignored the swelling as the pain was only mild.

From May to July 2016, the swelling and the pain in that region rapidly increased, to the extent that the patient had difficulty walking.

According to the initial interview on admission, there was no history of medication, including anticoagulant therapy.

Physical examination revealed a tense-elastic consistency swelling of 19 × 15 cm in size, extending on the abdominal wall, in the left flank region, with a smooth surface and a slight fluctuation.

Laboratory blood tests were within the limits: prothrombin time = 13 seconds (reference [ref]: 11.0-14.2 seconds), international normalized ratio = 0.96 (ref: 0.85-1.2), activated partial thromboplastin time = 30.0 seconds (ref: 26.0-37.2), hemoglobin = 13.7 g/dL (ref. = 12/17 g/dL), and platelet count 257,000 u/L (ref: 156,000-373,000 u/L).

Multidetector computed tomography (MDCT) was subsequently performed to assess the size, the location, and the morphostructural features of the lesion.

The MDCT was performed with a 64-row MDCT scanner (LightSpeed VCT; General Electric, Milwaukee, WI) and an intravenous administration of a contrast medium (Iomeron 350; Bracco, Milan, Italy) followed by a saline chaser.

A computed tomography (CT) scan was performed with the following parameters: rotation time, 0.8 second; 2.5-mm-thick sections; automatic milliamperage (mA) (min 300 mA, max 450 mA), and 120 kV. All reconstructed datasets were transferred to a dedicated off-line workstation (Advantage Windows 4.4, General Electric, Milwaukee, Wisconsin) to obtain 2-dimensional multiplanar reconstruction and maximum intensity projection reconstructions.

The capsulated lesion had smooth margins, was located between the internal abdominal muscle and the subcutaneous tissue of the abdominal wall, extending up to the level of the gluteus medius muscle, and was made of both cystic and solid components. Fluid-fluid levels were also evident (Fig. 1). Contrast enhancement was appreciated only in the peripheral capsule, but not within the inner components of the lesion. Furthermore, fat planes were well preserved with no signs of infiltration (Fig. 1).

A subsequent magnetic resonance imaging (MRI) examination was performed with a 1.5-T MRI scanner (Intera 1.5 T; Philips, Best, The Netherlands) and an intravenous administration of a contrast medium (Gadovist 1.0 mmol/mL; Bayer, Munich, Germany) followed by a saline chaser, using T1-weighted, T2-weighted, and short tau inversion recovery (STIR) sequences on axial and coronal plans in the basal condition, with a slice thickness of 7 mm and a slice interval of 1 mm and 3D gradient echo T1 dynamic sequences obtained after 25, 55, and 118 seconds from the contrast media infusion.

The lesion showed a high signal intensity in the T1-weighted sequences and a low signal intensity in the T2-weighted and short tau inversion recovery sequences. Inner components had an inhomogeneous signal intensity in all baseline sequences (Fig. 2). Fluid-fluid levels reflecting of internal settling of fluid and solid components were also evident (Figs. 2 and 3). Contrast-enhanced T1-weighted images showed a poor enhancement of the capsule of the inner components in the arterial and venous phases (Fig. 3B and C).

Like CT examination, MRI scans did not show any sign of infiltration of the skin and adjacent muscle planes.

Based on the previously mentioned results and the clinical course, an organized hematoma seemed likely, although a soft-tissue malignancy was also suspected, so we decided to perform a single-stage marginal excision, including the

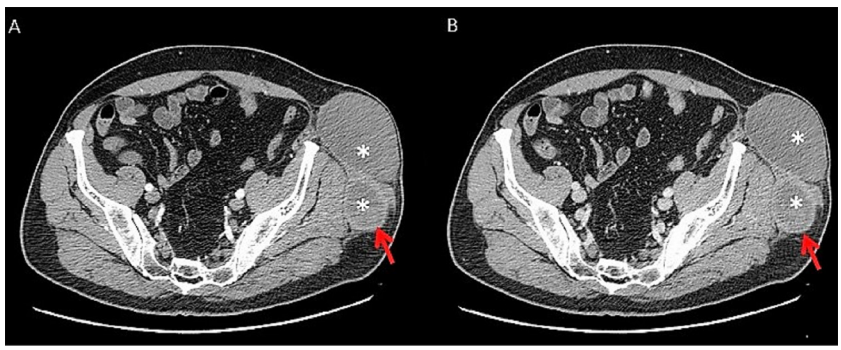

Fig. 1 – Axial contrast-enhanced CT of the abdomen and pelvis (arterial and portal phase). Technique: rotation time, 0.8 second; 300 mAs; 120 kV; 2.5-mm slice thickness; contrast medium: 120 mL of Iomeron 350 (Bracco, Italy). Scan delays: arterial phase: 35 seconds; portal phase: 80 seconds. The lesion is located between the internal abdominal muscle and the subcutaneous tissue of the abdominal wall, extending up to the level of the gluteus medius muscle. Fluid-fluid levels (asterisks) can be appreciated. Contrast enhancement of the peripheral capsule can be appreciated (arrows). No hemorrhagic foci are evident.

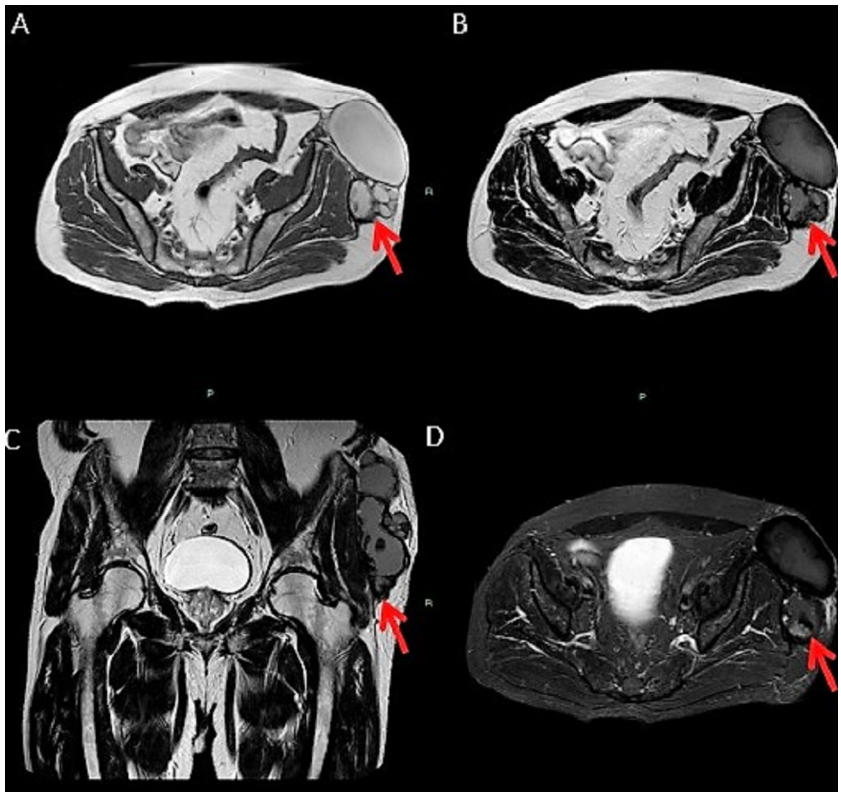

Fig. 2 – Axial and coronal MRI of the pelvis. Technique: 1.5-T MRI scanner, Sense Torso Coil. (A) TSE T1 sequence (axial plane): TR: 450 ms, TE: 8 ms, slice thickness: 7 mm, slice interval: 1 mm. (B) TSE T2 sequence (axial plane): TR: 3614 ms, TE: 120 ms, slice thickness: 7 mm, slice interval: 1 mm. (C) TSE T2 sequence (coronal plane): TR: 4096 ms, TE: 120 ms, slice thickness: 6 mm, slice interval: 1 mm. (D) TSE STIR (axial plane): TR: 4379 ms, TE: 50 ms, slice thickness: 7 mm, slice interval: 1 mm. The lesion shows a high signal intensity in T1-weighted sequences (A) and a low signal intensity in T2-weighted (B, C) and STIR (D) sequences. Inner components show an inhomogeneous signal intensity in all baseline sequences (arrows). MRI, magnetic resonance imaging; STIR, short tau inversion recovery; TE, echo time; TR, repetition time; TSE, turbo spin echo.

underlying fascia and muscle tissue, after obtaining a signed informed consent.

The lesion was 19 × 12 × 5 cm in size, encased in a thick capsule, and when this was cut, blood material spilled out (Fig. 4). Some solid, necrotic elements were seen extended from the wall to the interior of the lesion.

Histologically, the mass appeared as a pseudocystic blood-filled lesion characterized by a sclerotic fibrous capsule infiltrated by many CD68-positive histiocytes and surrounded by 2 main types of vessels: small new granulation tissue associated vessels and large pre-existent vessels. The latter appeared fibrotic, sometimes occluded, and with signs of recanalization and many siderophages in vessel walls (Fig. 5). All these findings were indicative of chronic hemorrhage.

There were no postoperative complications, and there was no sign of recurrence at the 8-week follow-up.

Discussion

CEH is an uncommon clinical entity [5] described for the first time by Reid et al. as an organized blood collection that increases in size for more than a month after the initial hemorrhagic event [1].

CEH is encased in a fibrous capsule, is located on muscle fascia or between muscles, and often undergoes necrotic degradation, and because of these features it appears clinically as a subcutaneous, slowly growing palpable mass.

The pathogenic mechanisms are not fully known, but it has been suggested that the application of a direct shearing force, which splits the skin and the subcutaneous fat from the underlying fascia, generates a large potential space, which fills with blood.

This pathogenetic mechanism is similar to that of Morel-Lavallée lesions where, however, the virtual cavity that develops due to the traumatic event may also contain lymph and adipose tissues. Moreover, such lesions are rarely chronic and more frequently occur after a sports injury or motor vehicle accidents [6].

After the development of a fibrin matrix, cellular breakdown products of leukocytes, erythrocytes, hemoglobin, and platelets activate the inflammation process, so the development of a well-defined fibrous cavity and bleeding from fragile capillaries lining the cavity can be involved in the progressive growth of the lesion [7].

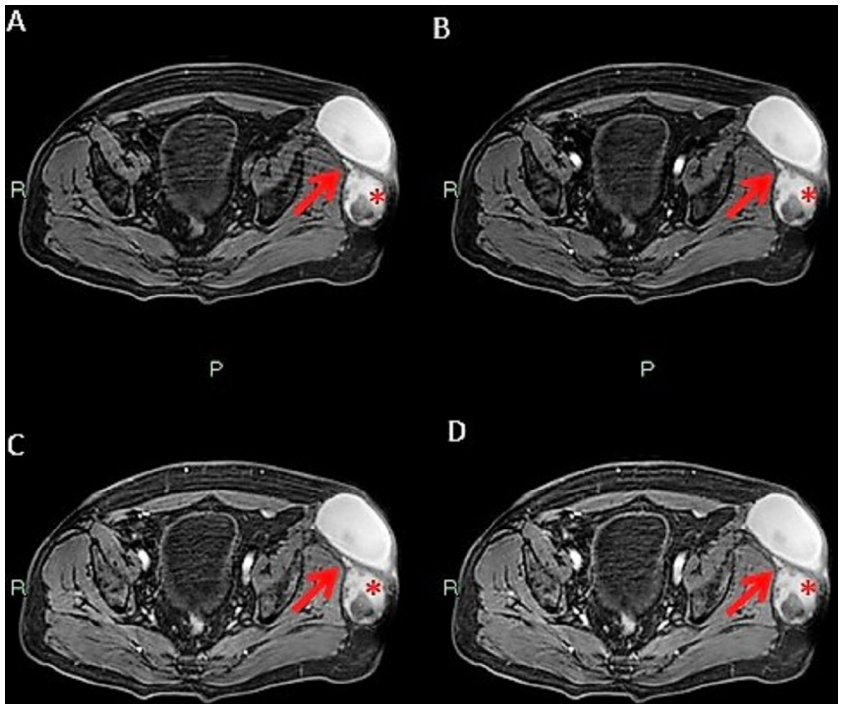

Fig. 3 – Axial baseline and contrast-enhanced MRI of the pelvis at baseline (A) and in the arterial (B), venous (C), and late (D) phases. Technique: 1.5-T MRI scanner, Sense Torso Coil. 3D GRE T1-weighted sequence at baseline (A) and 25 seconds (B), 55 seconds (C), and 118 seconds (D) after the intravenous administration of the contrast medium (6.5 mL of Gadovist 1.0 mmol/mL; Bayer, Munich, Germany). TR: 4 ms, TE: 2 ms. Baseline scan (A) compared with arterial (B) and venous (C) phase scans. Caspule and inner components (asterisks) of the lesion show poor enhancement with no evidence of infiltration of contiguous tissues (arrows). Fluid-fluid levels are also evident.

CEH presents clinically as a slowly growing palpable mass of tense-elastic consistency associated with pain. Often it is not associated with history of trauma, surgery, or bleeding disorders.

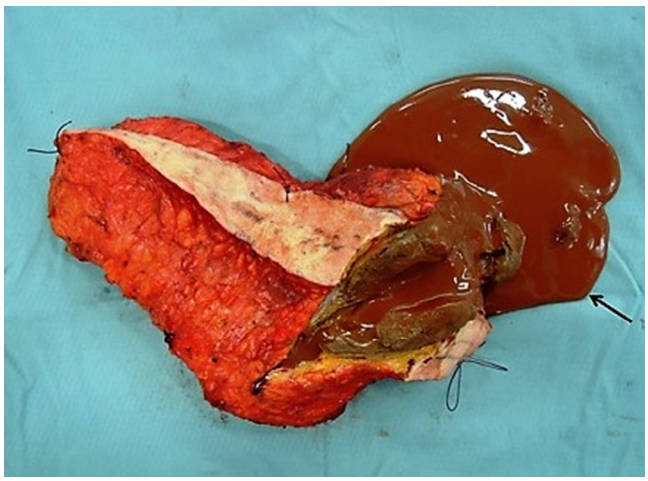

Fig. 4 – Photograph of the surgical specimen: The underlying fascia and muscle tissue were removed due to the uncertain nature of the lesion. At the cut fluid, bloodlike material spilled out (arrow).

Different imaging modalities can be used to aid the diagnosis.

At MDCT examination, CEH shows both cystic and solid densities, reflecting the presence of blood in various stages of coagulation. Moreover, the capsule shows a marked contrast enhancement, in contrast to the deep components.

In this case, MDCT was used to evaluate the vascularity of the lesion and the presence of hemorrhagic foci.

MRI can direct the clinician to the possible nature of the lesion and can allow the evaluation of the skin and adjacent muscular structures. Moreover, such as MDCT, dynamic sequences obtained after the administration of contrast media allow evaluation of the presence of hemorrhagic foci.

In this case, the MRI technique did not bring additional information on the hemorrhagic nature of the lesion, because CEH exhibits different signal intensities on T1- and T2-weighted images, reflecting the central zones of fluid collection due to the presence of blood in various stages of coagulation with a peripheral rim of low signal intensity representing a wall of fibrous tissue.

The differential diagnosis of a focal soft-tissue mass includes benign and malignant neoplasms, hematomas, abscesses, and accessory or hypertrophied muscles.

Soft-tissue hematomas can occur in the presence of bleeding diathesis, anticoagulant therapy, surgery, or trauma, and rarely occur spontaneously. In the majority of cases, soft-tissue hematomas present acutely and resolve spontaneously,

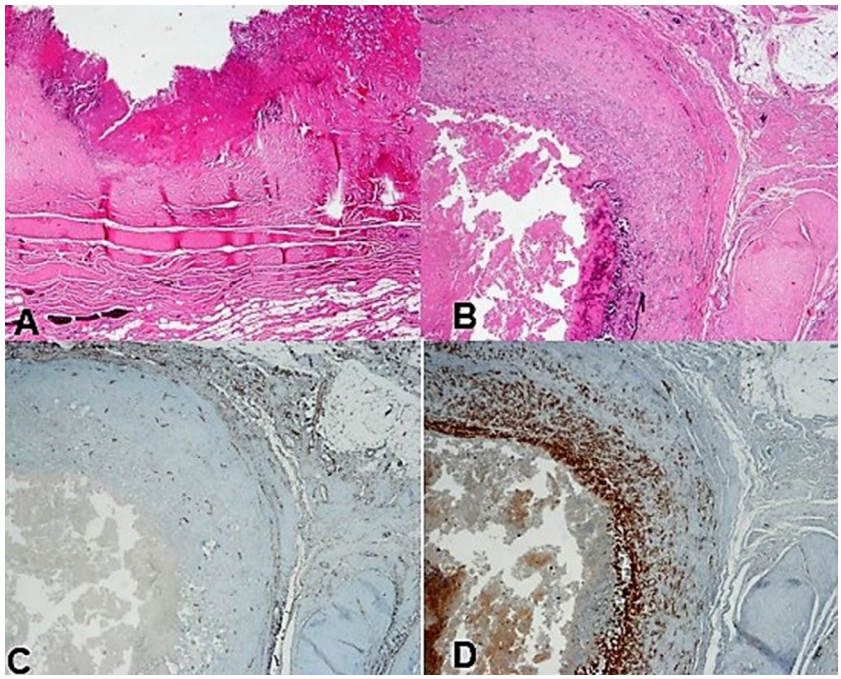

Fig. 5 – Representative histologic aspect of the mass. (A, B) pseudocystic cavity containing fibrinous hemorrhagic blood material with the underlying fibrous capsule (hematoxylin-eosin, original magnification 20×), surrounded by many small vessels (C, CD34) and CD68-positive histiocytes (D).

but sometimes, they present as swellings that slowly expand. In such cases, CEH may be suspected and can be mistaken for a soft-tissue neoplasm [2].

Synovial sarcoma, epithelioid sarcoma, and malignant fibrous histiocytoma exhibit the clinical and radiological features of hematomas [8], so sometimes it is very difficult to differentiate the hematoma from an aggressive soft-tissue neoplasm [9].

Synovial sarcoma is the most common malignant tumor of the lower-limb extremities and affects predominantly young patients. On MRI, synovial sarcoma appears as a well-defined lobulated subcutaneous lesion with a signal intensity similar to the muscle intensity on T1-weighted images and homogeneously hyperintense to the fat and the muscle on T2-weighted images. Synovial sarcoma is enhanced after gadolinium administration, which is particularly important for the differentiation from cystic lesions. Peripheral calcifications may be present, leading to decreased intensity foci on T1- and T2-weighted sequences [10].

Epithelioid sarcoma is seen in young adults, more frequently in male subjects [11], and accounts for 1.4% of all soft-tissue sarcomas. Epithelioid sarcoma often involves the upper extremity. It may be mineralized in approximately 20% of cases. However, the signal of the lesion on T1-weighted images is usually isointense to that of the muscle, with areas of high signal intensity caused by hemorrhage and necrosis. On T2-weighted images, the signal intensity varies greatly. Peritumoral edema-like signal areas are commonly seen [10].

Malignant fibrous histiocytoma is the most common soft-tissue sarcoma and is found most frequently in the thigh. On MRI, this entity shows an intermediate to low signal intensity on T1-weighted images and an inhomogeneous high signal intensity on T2-weighted images. Calcifications are present in 5%–20% of the lesions [12]. High-grade myxoid lesions may appear cystic, and images acquired after the administration of gadolinium reveal nodular nonmyxomatous elements [13].

Various treatments have been described, from conservative management, aspiration, drainage, and evacuation to complete excision [14].

Ultrasound-guided aspiration or drainage may not completely remove the blood contents and the fibrous wall that might retain fluid.

The contents of the hematomas can be variable and often fluid blood collections are mixed with clots.

If the contents are mostly coagulated, large-bore catheters can be useful but can be blocked by clots, and therefore drainage of this type of hematoma will not be successful.

The use of intracavitary fibrinolytic drugs, such as urokinase, may help to make the hematoma content more fluid and can allow optimal catheter progression [15].

Aspiration of the fluid or incomplete excision could lead either to an unconfirmed diagnosis or to recurrence [16].

Complete surgical excision is considered the gold standard treatment because it reduces the risk of recurrence due to the incomplete removal of the lesion, and it allows obtainment of the definitive histologic diagnosis [2].

In conclusion, in patients with slowly growing extremity masses without trauma history, bleeding diathesis, or chronic illness, in addition to cysts and soft-tissue neoplasms, CEH should be considered in the differential diagnosis.

CT and MRI techniques can be used with this purpose, and each of these techniques shows different features associated with CEH; however, imaging pathognomonic signs of this disease are not yet available.

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