back pain and pain in the left posterolateral part of the buttock and thigh. The patient appeared healthy and had no history of previous trauma or musculoskeletal disease. On physical examination, a slightly tender, hard, and fixed mass was palpated in the left PVM at the L5 level. Complete blood cell count, erythrocyte sedimentation rate, and blood chemistry values including serum calcium, phosphate, C-reactive protein, and alkaline phosphatase were all within normal limits.

Lateral lumbosacral spine X-ray showed calcific density near the spinous process of L5 and S1 (Fig. 1A). T2-weighted sagittal magnetic resonance imaging (MRI) showed heterogeneous high signal intensity at the PVM from L5 to S2 (Fig. 1B). Axial MRI showed a heterogeneous high signal intensity mass in T1- and T2-weighted image in the left PVM, and no enhancement of the mass was found in the Gadolinium-enhanced T1-weighted MRI (Fig. 2A, B, C). Findings on computed tomography revealed an inhomogenously calcified mass, and the mass was in continuity with or eroding the left-sided lamina, facet joint of the L5, and the sacrum (Fig. 2D).

The lack of typical imaging features required an open biopsy,

INTRODUCTION

Myositis ossificans (MO) is a benign, non-neoplastic, and heterotropic bone or cartilage formation in the muscle or soft tissue. Trauma plays a role in the development of MO, thus, non-traumatic MO is very rare. Although MO may occur anywhere in the body, it is rarely seen in the lumbosacral paravertebral muscle (PVM). Herein, we report a case of non-traumatic MO in the lumbosacral PVM. A 42-year-old man with no history of trauma was referred to our hospital for pain in the low back, left buttock, and left thigh. On physical examination, a slightly tender, hard, and fixed mass was palpated in the left lumbosacral PVM. Computed tomography showed a calcified mass within the left lumbosacral PVM. Magnetic resonance imaging (MRI) showed heterogeneous high signal intensity in T1- and T2-weighted image, and no enhancement of the mass was found in the postcontrast T1-weighted MRI. The lack of typical imaging features required an open biopsy, and MO was confirmed. MO should be considered in the differential diagnosis when the imaging findings show a mass involving PVM. When it is difficult to distinguish MO from soft tissue or bone malignancy by radiology, it is necessary to perform a biopsy to confirm the diagnosis.

Key Words : Myositis ossificans · Lumbosacral spine · Paravertebral muscle.

CASE REPORT

A 42-year-old man presented with a 4-month history of low back pain and pain in the left posterolateral part of the buttock and thigh. The patient appeared healthy and had no history of previous trauma or musculoskeletal disease. On physical examination, a slightly tender, hard, and fixed mass was palpated in the left PVM at the L5 level. Complete blood cell count, erythrocyte sedimentation rate, and blood chemistry values including serum calcium, phosphate, C-reactive protein, and alkaline phosphatase were all within normal limits.

Lateral lumbosacral spine X-ray showed calcific density near the spinous process of L5 and S1 (Fig. 1A). T2-weighted sagittal magnetic resonance imaging (MRI) showed heterogeneous high signal intensity at the PVM from L5 to S2 (Fig. 1B). Axial MRI showed a heterogeneous high signal intensity mass in T1- and T2-weighted image in the left PVM, and no enhancement of the mass was found in the Gadolinium-enhanced T1-weighted MRI (Fig. 2A, B, C). Findings on computed tomography revealed an inhomogenously calcified mass, and the mass was in continuity with or eroding the left-sided lamina, facet joint of the L5, and the sacrum (Fig. 2D).

The lack of typical imaging features required an open biopsy,
muscle because 60-75% of patients describe a clear history of trauma. However, trauma is not the only causative factor and the specific pathophysiological factors underlying the development of MO are not well-known at the present. In cases with an apparent history of traumatic injury, it can be assumed that the process commences with tissue necrosis or hemorrhage followed by exuberant reparative fibroblastic and vascular proliferation with eventual ossification. Several theories exist about the mechanism of MO. MO is a step in an organizing hematoma’s development and it is caused by osteoblasts that have escaped from periosteum and migrated into soft tissue. Mechanical injury can cause the osteoblast-containing periosteum to be pushed into muscle and thereby result in ectopic calcification in a muscle. Another possible source of provocation includes organic diseases such as poliomyelitis, tabes, syringomyelia, paraplegia, tetanus and hemophilia. In these entities, MO can always appear after trauma caused by passive movements. In a small number of cases, the etiology includes burns, infections, and even drug abuse. Although it is rare, MO may arise spontaneously without antecedent trauma. In non-traumatic MO, repetitive small mechanical injuries, ischemia, or inflammation have been implicated as possible causes of MO. The present case seems to belong to the non-traumatic MO. In the present case, the patient did not recall any history of trauma, had no history of the physiotherapy, injection therapy, or acupuncture for his pain, and none of the above-mentioned predisposing factors or diseases were identified. However, the possibility cannot be excluded that a minor trauma has been overlooked or forgotten by the patient.

Myositis ossificans affecting the PVM is very rare except for fibrodysplasia ossificans progressiva (FOP). FOP is an autosomal dominant disorder with an average age of onset at 5 years; the onset range is from birth to 25 years. FOP may pres-
ent its first symptom as a firm paravertebral swelling with a red-
dened overlying skin with no history of trauma. It is a pro-
gressive disease, and malformed big toes or thumbs are common anomalies that appear with FOP. In the present
case, the patient was in his 40s, did not have any congenital an-
amalies, and had no family history of musculoskeletal dis-
ease, which lowered the possibility of FOP. As far as we know,
only a few cases of MO involving the PVM have been reported,
irrespective of the traumatic or non-traumatic cause. MO affect-
ing the lumbar PVM is rarer than that of the cervical PVM.
However, the cause is uncertain, and we could not find any
reports or hypotheses about this point in the literature.

Histologically, bone maturation occurs from the periphery to
the center, and this zonal phenomenon of peripheral maturation
is the most important diagnostic feature of MO. In the central
area, there are streams of cells producing collagen, in the in-
termediate area, there is an osteoblastic production of immu-
nature bone, and in the peripheral zone, the woven bone changes
in mature lamellar bone. Shortly after injury, a painful, tender,
soft tissue mass becomes apparent, which may be associated
with periosteal reaction in 7-10 days. Flocculent dense lesions
signifying the onset of ossification arise in the mass from 11
days to 6 weeks. At 6-8 weeks, a lacy pattern of new bone
with a sharp peripheral cortex is formed. From 10 weeks to 6
months, the central zone may enlarge and produce the appear-
ance of an “egg shell” at the end stage of maturation. Full
maturity is completed in 5-6 months, and then the mass usually
begins to shrink. After 1-2 years, most lesions regress and
may even disappear. The appearance of MO on MRI is variable and depends on the
maturity and the variation of the histological pattern within the
lesion. In the early stages, T2-weighted images may show an
inhomogenous focal mass with high central signal intensity. As
the lesion matures and the peripheral ossification becomes
denser, the images show a hyperintense center surrounded by a
hypointense rim corresponding to peripheral ossification.
Chronic lesions are well-defined inhomogeneous masses with a
signal intensity approximating that of fat, which may come
from fatty marrow, on both T2- and T1-weighted images with
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CONCLUSION

The occurrence of non-traumatic MO in the lumbosacral
PVM is very rare. However, MO should be considered in the
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