



MYOSITIS OSSIFICATION IN THE LUMBAR SPINE - A CASE REPORT

Bikash Neupane*¹, Shang hui² and Zhao Xiao Lin³

**¹Ms Orthopedics 3rd year resident at tai he hospital, Hubei, China*

²Md/Ms Spine surgeon in tai he hospital, Hubei, China

³Md/Ms Resident doctor department of spine

ABSTRACT

Female patient of 28 years old from china Hubei shiyan. With the diagnosis of non-traumatic myositis ossificans, who has symptoms of back pain and loss in motion, went for surgical excision in the department of the spine in tai he hospital.

Objective: Rare and progressive but nonmalignant disease.

Keywords: Mo -myositis ossificans, lumbar spine, non-traumatic.

BACKGROUND

Myositis ossificans is a condition of heterotrophic bone formation in muscle or soft tissue which is rare and is non-neoplastic. Trauma plays significant role or cause of the creation of this condition, so it is a rare condition which can occur anywhere in the body, where the elbow is the most common site for the formation of myositis ossificans, but this is mostly situated at higher risk site of injury like a large muscle of extremities. Myositis ossification in the lumbar region and vertebral and paravertebral muscles is a very rare condition. The pathologic and clinical appearance of myositis ossificans differs according to the time elapsed after heterotopic bone formation. And its aetiology is not clear. MO mainly occurs athletic and young individual. The affected ratio of males and females is equal. Concerned patients present with a short history duration, usually of less than the three months of pain and swelling in the area that is involved. These lesions can progress to ankylosis by limiting the joints motion in patients. In radiological investigations, there is difficult to identify and distinguish this condition from soft tissue and bone malignancy; so, the careful correlation between the clinical and radiologic findings with a biopsy is needed to confirm the diagnosis. This case report describes a rare case of calcifying myositis ossificans in paravertebral muscles in the lumbar spine. The 28-year-old female patient was referred to our hospital with severe low back pain with the restriction of low back motions. There was no relevant history of trauma or family history of interest. Total excision of the mass resulted in a proper functional recovery.

CASE REPORT

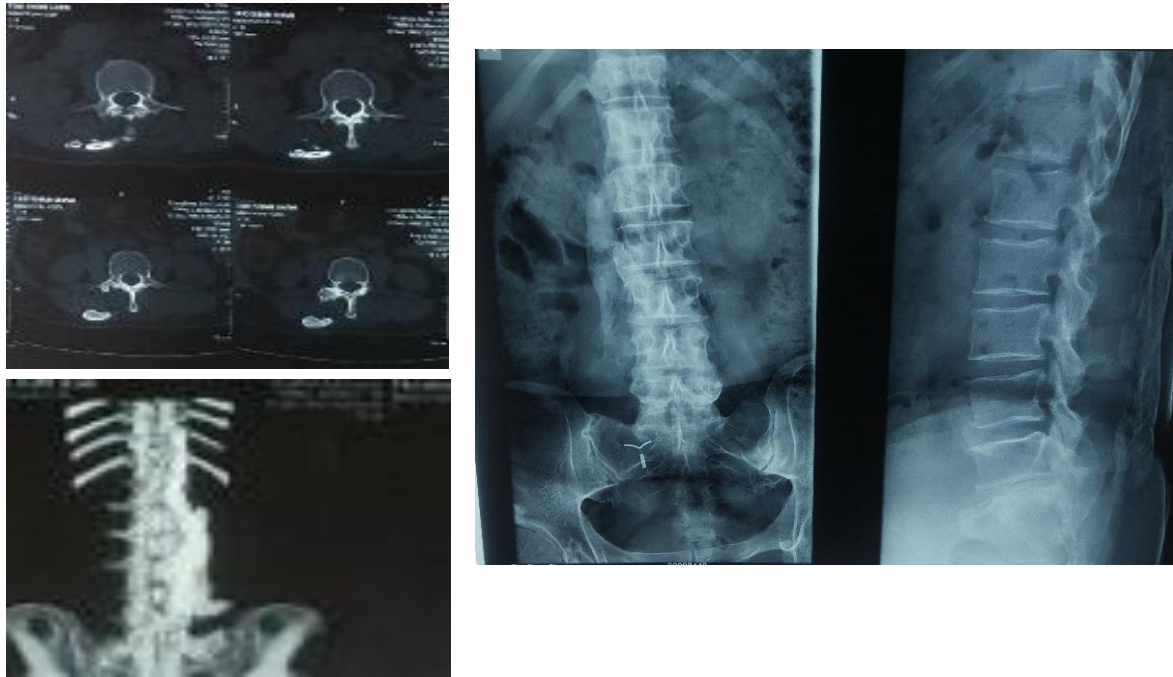
This 28-year-old Chinese female patient was referred to our hospital with complaints of severe low back pain which was restricting her motions, and there was a palpable mass in the lower back region for almost four years. There was no history of trauma, including exercise-related trauma or family history. Initially patient found back mass on the right side that is accompanied by pain on bending and limited activity and was slightly swollen .no any skin ulcer and rashes. The patient was healthy, and she had no history of previous trauma or musculoskeletal disease.

On physical examination: a slightly tender, hard, and fixed mass that was palpable in the right Paravertebral muscle at the lumbar region. There was no erythema and skin ulcer or rashes,

On Neurological examination: no motor or sensory deficits, with normal reflexes. Muscular power and tone were normal. Both Hoffman and clonus reflexes were bilaterally negative.

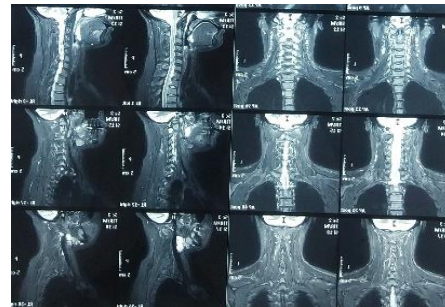
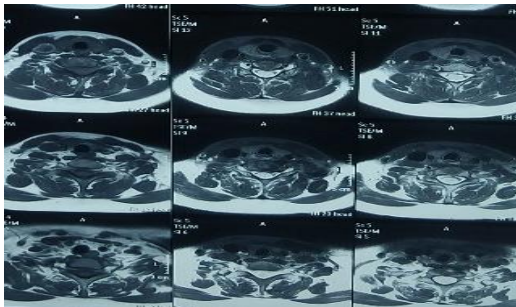
Before the patient was referred to our hospital, she went to another medical Centre, where she underwent radiography CT, and MR imaging, that shows a regular ossified mass in the paravertebral muscle on the right facet joint of lumbar vertebrae. From T10 to L5.MR imaging of the lumbar spine revealed an inhomogeneous, well-formed shell of a bony lesion and was diagnosed as myositis ossificans of the lumbar spine. Then for the better treatment and advice patient came to our hospital on 2018 Jan 28, and the patient was examined, on examination, there was a palpable mass on the right paravertebral region, with pain with Visual Analogue Score (VAS) =4 with mild tenderness and restriction of movement. And the patient was advised for admission and agreed to admit. On entry, all systemic examination was found healthy, and the patient denies

the history of trauma, diabetes, tuberculosis, and hypertension and other co - morbidity condition. on admission vitals were normal and patient went through needful investigation including full blood count, ESR, CRP, X-RAY, CT, MRI. blood investigation was found normal, on radiographic and MRI, patient was found myositis ossificans in lumbar spine in right paravertebral muscles extending from T10- L5. with normal disc space and normal physiological curvature, there was no spinal cord signal abnormality.



x - ray

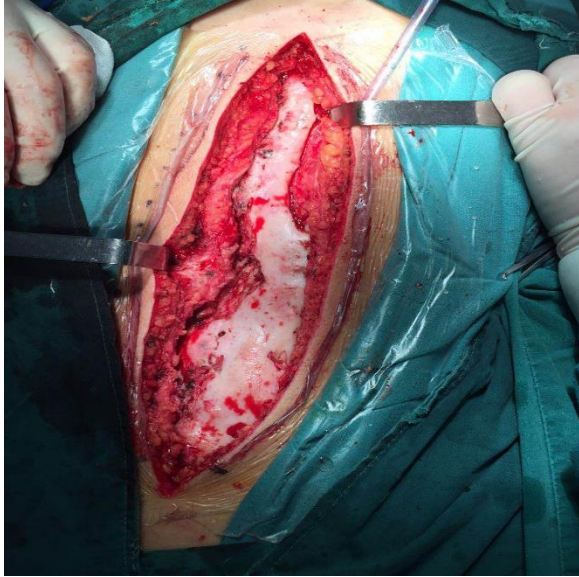
Ct image



MRI, showing high signal heterogeneous ossification

After all the needed work up and process, the patient was planned for the operative procedure and was counselled about the process and outcome, as the patient agreed. Surgery was done under general anaesthesia. The patient was placed prone, and a midline vertical incision from spinous processes of T9 to L5 vertebrae was given. A well-circumscribed, grey-yellow coloured and bony solid mass with sandy areas was seen. And mass was excised and taken out. After surgery, patient was taken to ward and had no neurological

abnormality and physiological abnormality. And was discharged with better health and excellent outcomes. The patient returned home happily in good condition. The specimen was sent for histological and pathological examination, and examinations of the surgical specimen confirmed the diagnosis of myositis ossificans.



Operative findings showing myositis ossification



Mass excised from site



Post-operative wound after fifth day

DISCUSSIONS

Myositis ossificans is a benign, non-neoplastic and self-limiting heterotopic formation of bone within the muscle or soft tissues which usually develops in young adults and adolescents, usually following trauma. The cause is thought to be post traumatic inflammatory changes in skeletal muscles because large number of patient gives history of trauma very clearly ,however the cause is not only the trauma and specific pathophysiological factor underlying the development of MO are well known at present .however in case of trauma it is assumed that there is hemorrhage or tissue necrosis followed by exuberant reparative fibroblastic and vascular proliferation with eventual ossification (3), and as hematoma develops it is believed that osteoblast have escaped from periosteum and migrate into soft tissue mechanical injury can cause osteoblast containing periosteum to be pushed into muscle and result in ectopic calcification in muscle(3). Another possible cause including organic disease such as poliomyelitis, tabes, syringomyelia, paraplegia, tetanus and hemophilia, and other number of cases like burns, infection and even drug abuse. (3)

Although myositis ossificans usually occurs in larger muscles of proximal extremities such as quadriceps and brachialis.it is rare to occur in lumbar spine (4) .as this condition is rare annual incidence is supposed to be less than 1 per 1 million individuals. Both sex is equally affected. More common in young athletic men (mean age is 23.8) years (1). Our case seems to be non-traumatic, and denies history of any other intervention however there might be possibility of trauma which might have forgotten by patient. And in non-traumatic MO repetitive minor mechanical injury inflammation or ischemia is thought to be the cause however exact cause is not known.

MO is classified into three types:

1. **Myositis ossificans progressive:** metabolic disorder that occur in children with widespread metamorphosis of muscles into bone .it is rare inherited disorder characterized by fibrosis and ossification of muscles, tendons, ligament at different sites.
2. **Traumatic myositis ossificans circumscripta:** this due to local acute or chronic trauma, commonest and occurs in 60-75 % of cases.
3. **Myositis ossificans circumscripta without history of trauma (non traumatic MO):** THIS IS USUALLY FOUND infection, burns, paraplegia poliomyelitis. Etiology is unknown major injury like dislocations, fractures and minor repetitive trauma are considered the frequent causes.

GRADE I	Ossification islands around the hip
GRADE II	Bone projection of pelvis or proximal femur with at least 1 cm away from the opposite surface
GRADE III	Bone projection of pelvis or proximal femur reducing space between opposite surface lower than 1 cm
GRADE IV	Hip ankylosis

Chart 1: Classification proposed by Brooker et al.15 according to radiologic aspects of injury.

Acta Ortop Bras. 2014;22(1):12-6

Typical clinical presentation of this condition includes rapid onset of pain, palpable mass, flexion contracture, local heat and swelling as well as decreased range of motion. In our patient, the presenting symptom was lower back pain accompanied on movements and restriction of movements of waist and pain on sacroiliac region. With restriction of movements of lumbar spine.

Risk factor include, male sex, past history of heterotrophic ossification, hypertrophic osteoarthritis, ankylosing spondylitis and diffuse idiopathic skeletal hyperostosis(1).MO is essentially proliferative mesenchymal response to an initiating injury to the soft tissue which lead to localized ossification .in the first week richly vascularized proliferative fibroblastic cells are prominent. These primitive mesenchymal cells, with high mitotic activity can mimic malignancy on biopsy with maturation of the lesion which is variable, a typical zonal pattern develops with three distinct zones (1).

1. Central consists of rapidly proliferating fibroblast with areas of hemorrhage necrotizing muscles.
2. The intermediate or middle zone is characterized by osteoblast with immature osteoid formation and island of cartilage due to enchondral ossification.
3. Peripheral region is composed of mature bone, usually well separated from surrounding tissue by myxoid fibrous tissue. ACKERMAN named it as the zone phenomena and is essential criteria for the diagnosis of MO (1).

Histologically, myositis ossificans tends to display atypical zonal pattern the central zone is comprised of undifferentiated mesenchymal cells with high-grade mitotic activity, which may suggest malignant neoplasm. Therefore, an early biopsy of the centre lesion may lead to miss-diagnosis. The radiologic findings of myositis ossificans mirror the histologic pattern of maturation. The most initial radiologic change appears within 1 to 2 weeks as a soft tissue mass, which may be accompanied by faint periosteal new bone formation. By 3-4 weeks, follicular calcification appears in the soft tissue mass. By 6-8 weeks, a lacy pattern of new bone formation in the peripheral zone is formed. the zonal pattern of peripheral maturation is the most important diagnostic feature. By 5 to 6 months, the mass shrinks and maturation is completed.

CT is the standard investigation in characterizing typical findings in MO, to rule out whether it is extensive muscles, perilesional edema whether involving bone marrow or cortical abnormalities.

The MRI appearance of myositis ossificans depends with the stage of maturation and the histologic pattern of the lesion. In the early stages, T2-weighted images may show an in-homogenous focal mass with high central signal intensity. As the lesion matures and the peripheral ossification becomes denser, the images show a hyper-intense center surrounded by a hypo-intense rim corresponding to peripheral ossification (1).

In our case we use both CT and MRI, there was lesion on right side extending from T10-L5. with intact neurology and normal disc space and is paravertebral area. And blood investigation and serum biomarkers and biopsy were in normal limit, so do not think of any suspected tumor or osteosarcoma.

MO is benign self-limiting disease, and its benign condition, treatment in most case is conservative, consists of rest, ice, NSAIDs, physiotherapy. NSAIDs is used to relieve pain and physiotherapy to improve movements. Typically, a regression of symptoms also seen in the course of the disease (30%) (4). Spontaneous

resorption of an incomplete regression can occur. Surgical intervention is done when a heterotrophic bone is matured, ideally at 9 to 12 month after onset of heterotrophic mass. But sometimes surgical excision is advised and done when the joint function is impaired neurovascular impingement is noted, or lesion is usually a broad or painful range of movements. Recurrence is hugely uncommon even when resection margins are positive (1)

CONCLUSIONS

The case is benign and rare localization for a MO. There was neither history of trauma nor any detailed family history, it was typically identified on CT and MRI examination, however, MO should be considered when imaging shows a mass involving PVM, surgery was performed because of unusual noticeable mass and pain on movements and affecting daily activities. Typical findings in CT and MRI examination will show matured heterotrophic bone mass.

However, other needful investigation and biopsy should be done to confirm the diagnosis and to exclude tumour like conditions.

REFERENCES

1. Anas Abdallah,^{A,B,C,D,E,F,G,1} Akin Gokcedag, Non-Traumatic Myositis Ossificans in the Lumbar Spine Am J Case Rep. 2014; 15: 421–425 2014 Oct 1. Doi: 10.12659/AJCR.891151.
2. Kim SW¹, Choi JH. Myositis ossificans in psoas muscle after lumbar spine fracture Spine (Phila Pa 1976). 2009 May 1;34(10):E367-70. Doi: 10.1097/BRS.0b013e31819b30bf.
3. Daeyoung Jung, M.D.,¹ Keun-Tae Cho, Non-Traumatic Myositis Ossificans in the Lumbosacral Paravertebral Muscle J Korean Neurosurg Soc. 2013 May; 53(5): 305–308. 2013 May 31. Doi: 10.3340/jkns.2013.53.5.305.
4. Yuko Kobashi^{1*}, Shou Ogiwara² and Kunihiro Fukuda² Myositis Ossificans in the Lumbar Spine: A Case Report <http://dx.doi.org/10.17140/SEMOJ-1-128>.
5. Mi Nyong Choi, M.D., Gyung Kyu Lee, M.D., Kyung Jin Suh, M.D. Myositis Ossificans of the Psoas Muscle After Compression Fracture of Lumbar Spine: CT and MR Imaging Findings J Korean Soc Radiol 2010;63:75-78.
6. Maurício Coelho Lima¹, Marcus Ceregati Passarelli¹ the use of spect/ct in the evaluation of heterotopicossification in para/tetraplegics.