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A case report: Post injection myositis ossificans

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Abstract
Myositis ossificans (MO) occurs as a complication in approximately 20% of large haematomas associated with muscle contusions and strains. Post-traumatic myositis ossificans is a benign condition of heterotopic bone formation, which can mimic soft-tissue or bone malignancies. We are presenting a case of 22 year old female patient presented to us with complaint of pain and swelling over lateral aspect of right thigh since 3 months following intramuscular injection at right gluteal region. There was history of massage. On examination swelling was located on lateral aspect of right thigh, just below greater trochanter of femur measuring size of 4*4 cm with normal local temperature. Swelling was hard, non-reducible, non-mobile in nature. MRI was suggestive of 4*2.8 cm size hyperintense foci at inferiolateral aspect of right gluteal maximus muscle. It was excised in toto. Post operative patient had significant pain relief with good outcome in range of movement.

Keywords: Post injection, myositis ossificans, gluteus maximus, excision

Introduction
Myositis ossificans, also known as heterotrophic ossification or ectopic ossification, is a pathologic bone formation that occurs in soft tissues that do not normally ossify. It initially presents as a well-circumscribed lesion that frequently complicates hematoma formation of the muscles, particularly of the proximal extremities [2].It is commonly seen in the hip musculature of adolescents who are susceptible to sports trauma with contusions. The lesion contains actively proliferating fibroblasts and osteoblasts. Early in its development it may be confused with a malignant tumour. Any roentgenograms made early may reveal no mineralization, but by the time the lesion is observed clinically, at least some ossification is usually seen.

Case report
A case of 22 year old Indian female patient presented to us with complaint of pain and swelling over lateral aspect of right thigh since 3 months following intramuscular injection at right gluteal region which became firm and gradually painful. There was history of massage. The patient's significant medical history was negative and she specifically denied any weight loss, malaise or anorexia. Swelling was located on lateral aspect of right thigh, just below greater trochanter of femur measuring size of 4*4 cm with normal local temperature. Swelling was hard, non-reducible, non-mobile in nature. Results of laboratory tests were unremarkable, with a white blood cell count of 8,200/mm3; calcium levels of 8.9 mg/dl. A right hip radiograph showed subcutaneous calcifications of the right hip with no bony involvement (Figure 1). MRI was suggestive of 4*2.8 cm size hyperintense foci at inferiolateral aspect of right gluteal maximus muscle (figure 2, 3 & 4). It was managed by excision of affected part. Post-operative patient had significant pain relief with good outcome in range of movement.

Discussion
Myositis ossificans was seen in our patient accounts for 75% of cases [4]. This phenomenon of unknown etiology occurs after damage to muscles with subsequent proliferation of connective tissue and differentiation into mature bone. The most frequently reported risk factor is reinjury during the early stages of recovery [5]. In adolescents and young adults, the thighs and hips are most commonly involved in myositis ossificans [6]. Other common sites of myositis ossificans are the upper arm, calf, and sole of the foot. Lesions result in functionally significant deficits

in only 10–20% of patients [8]. Symptoms include localized swelling and tenderness and associated decreased range of motion in the affected extremity [9]. Early in the disease, the lesion is soft and painful, and within a few weeks a firm and often painful mass develops in the affected muscles. This lesion matures over 12 months, and eventually ossifies and becomes painless. Urist *et al* first observed that acid-demineralized bone matrix could induce fibroblastic cells in muscle tissue to become osteogenic and chondrogenic [10] and they named the associated factor bone morphogenetic protein. Other osteoinductive factors have since been recognized. Cells of connective tissue that can differentiate into bone have also been identified and named osteogenic progenitor cells [10], which have been found among blood and lymphoid cells and are believed to be part of the marrow stromal system. It has been postulated that perhaps these osteogenic progenitor cells circulate freely and are stimulated by osteoinductive factors to form osteoid tissue when tissue injury occurs.The progressive lesion is often between 3 cm and 6 cm, with a soft erythematous center and firm periphery [11]. The microscopic findings vary according to the age of the lesion and are mirrored by radiographic findings. Early in the disease course, the lesion is mostly cellular with fibroblastic tissue resembling a granulation tissue, and radiographs are often negative [8]. As the area of ossification expands, radiographs demonstrate flocculent radio densities or calcifications. As the lesion matures, it completely ossifies. Radionuclear scans can also be used as an adjunct for diagnosis because an increased uptake correlates accurately with ectopic bone formation [12]. Computerized axial tomography is the preferred imaging modality to demonstrate the zonal pattern in myositis ossificans [13]. It optimally identifies the typical patterns of this disease, including the separation of the mass from the adjacent cortex and the decreased attenuation of the center of the mass. MRI is the technique of choice for evaluating soft-tissue lesions [14]. The classic finding for myositis ossificans is a peripheral rim enhancement that correlates with calcification and ossification. Myositis ossificans is often confused with and must be distinguished from osteosarcoma. Pain and swelling in osteosarcoma are persistent and progressive(4) and periosteal elevation and cortical destruction are present on bone radiographs, with anaplasia on microscopic biopsy evaluation.Early in the disease course, rest, ice, compression, and elevation are universally recommended. Myositis ossificans is self limiting and can spontaneously resolve [2]. Most authors recommend an initial 24–48-hour period of immobilization followed by rehabilitation to prevent reinjury. Definitive treatment for heterotopic bone formation is usually reserved for symptomatic lesions [15]. Patients without any reports of pain or decreased mobility may be better off avoiding the morbidity associated with excision. Excision is only indicated if the lesion is completely ossified because removal of immature bone may cause extensive local recurrence. Some studies suggest that using prophylactic indomethacin and etidronate can be beneficial in reducing postsurgical ectopic calcification [16]. Myositis ossificans is a rare but significant clinical entity. Understanding its etiology and pathophysiology can save the patient from spurious medical workups and the anxiety of a suspected neoplasm.

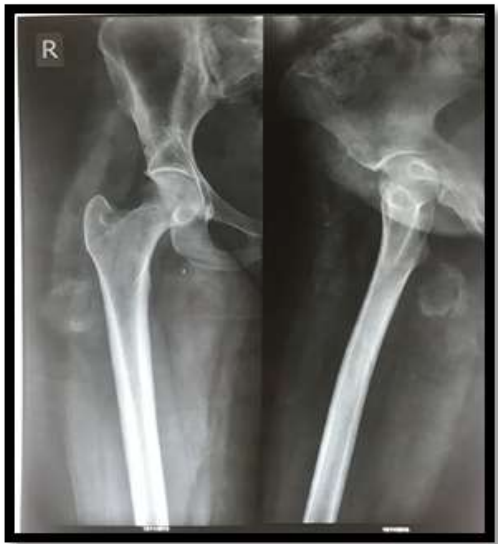

Fig 1: pre-operative x ray

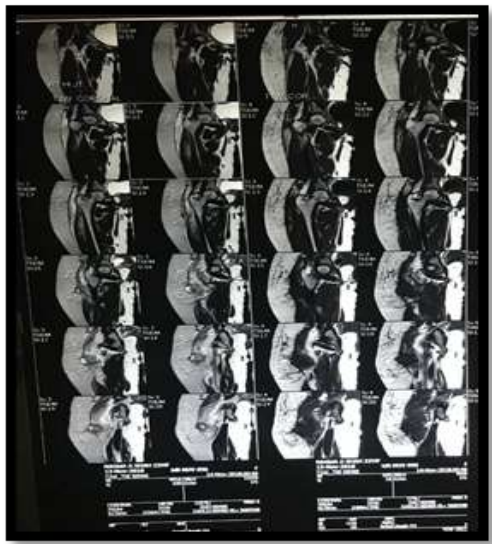

Fig 2: MRI T1 & T2 coronal

Fig 3: sagittal MRI picture

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MRI RIGHT HIP JOINT WITH GLUTEAL AND PROXIMAL THIGH REGION

FINDINGS

Approximately 2.6 x 4.0 cm sized well defined altered signal intensity lesion with internal T2 hyperintense foci within the intralateral aspect of right gluteus maximus muscle. There is significant adjacent fat stranding and muscle edema noted in form of hyperintense fat suppressed images.
There is mild atrophy of right gluteus maximus muscle. On post contrast study, the lesion shows heterogenous enhancement. Possibly differential diagnosis would be
1.) Developing abscess
2.) Intramuscular soft tissue mass lesion.

Biopsy correlation and further evaluation is recommended.

Head of femur appears normal in contour with normal signal intensities on T1 and T2WI.
Articular surfaces of right hip joint look normal.
Joint space appears normal.
No evidence of changes of avascular necrosis seen in the head of the femur on right side.
No evidence of synovial effusion seen in the hip joints on right side.
Bone marrow appears normal in head, neck and upper shaft of femur.
The soft tissue shadows around the hip joint look normal.

Dr. Vishal Bhardava
Consultant radiologist

Fig 4: MRI report

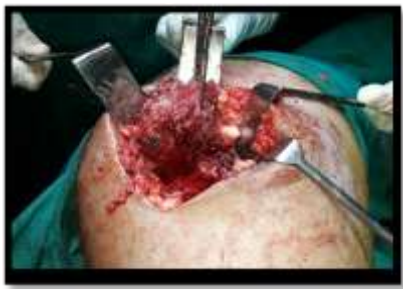

Fig 7: Inra-operative picture

Fig 6: Intra-operative picture

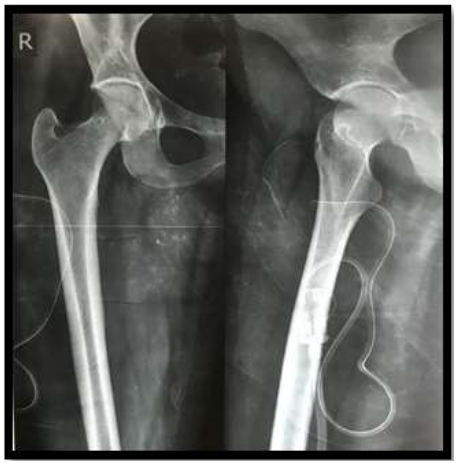

Fig 6: post-operative x-ray

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