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Myositis Ossificans of the Temporal Muscle as a Primary Scalp Tumor

—Case Report—

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Abstract

A 38-year-old woman presented with a rare case of myositis ossificans in the temporal muscle manifesting as left temporal scalp mass with mild pain. The mass was elastic-hard and seemed to be located in the temporal muscle. Magnetic resonance imaging revealed a heterogeneously enhanced mass in the muscle. The tumor was resected. The histological diagnosis was myositis ossificans. The clinicopathological features of scalp myositis ossificans may mimic other soft tissue tumors, requiring care for the differential diagnosis.

Key words: scalp tumor, myositis ossificans, temporal muscle

Introduction

Myositis ossificans is an extraosseous nonneoplastic tumor forming fibrous tissue, bone, and cartilage within muscle.[1,7] The nodular cutaneous tumor is most common in the extremities.[1] We describe a rare case of myositis ossificans in the temporal muscle of the scalp.

Case Report

A 38-year-old woman found an elastic-hard small mass associated with a previous 2-week history of mild pain on her left temporal scalp in September 1999 and consulted a neighborhood clinic. She had no apparent history of trauma. She was treated with analgesics and subsequently was transferred to our clinic.

Physical examination found an elastic-hard enplaque scalp tumor on her left temporal region which seemed to be located in the temporal muscle. Radiography of the skull demonstrated no abnormality. Computed tomography (CT) revealed a high density mass in the subcutaneous tissue, with marginal enhancement (Fig. 1). No calcification was apparent. Magnetic resonance imaging also showed a heterogeneously enhanced mass in the temporal muscle (Fig. 2). Hematological examination revealed no abnormalities.

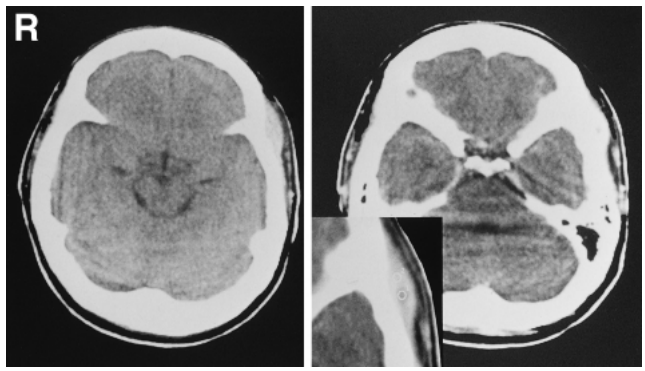

Fig. 1 Computed tomography scans showing a high density mass in the left temporal subcutaneous tissue (*left*) with marginal enhancement (*right*).

Simple resection of the tumor including the temporal muscle was performed. Histological examination of the tumor attached to the periosteum found partial calcification and thickening of the periosteum, which are typical features of myositis ossificans. Spicules of osteoid with osteoblastic rimming were surrounded by spindle-shaped fibroblasts. No macrophage infiltration was apparent despite the presence of minute lymphocytes (Fig. 3).

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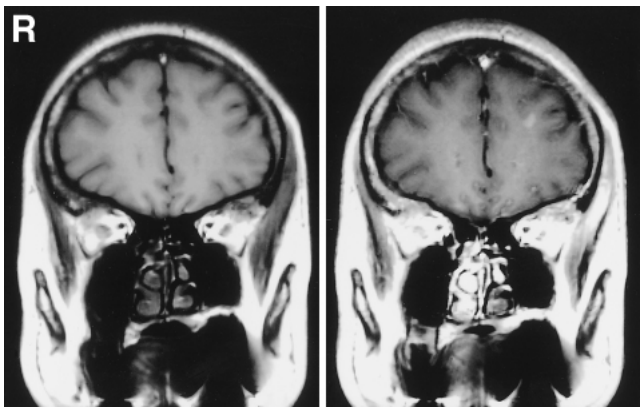

Fig. 2 **T_1-weighted magnetic resonance images showing an isointense mass in the temporal muscle (*left*) with heterogeneous enhancement by gadolinium (*right*).**

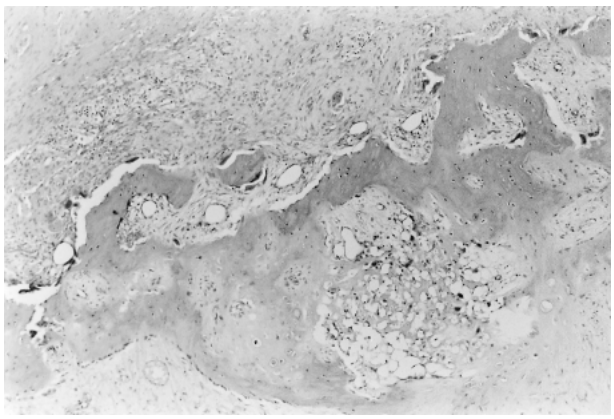

Fig. 3 **Photomicrograph showing spicules of osteoid with osteoblastic rimming surrounded by spindle-shaped fibroblasts. Hematoxylin-eosin stain, ×70.**

Discussion

Four types of myositis ossificans have been reported.[7] The most common type is myositis ossificans circumscripta, which is a localized, self-limiting form secondary to blunt, penetrating, thermal, or iatrogenic trauma. This type is most common in the flexor muscles of the upper arm, the quadriceps femoris, and the adductor muscle of the thigh of adolescents and young adults. Location in the head, neck, finger, chest wall, and lumbar spine is unusual.[2–5] The initial injury is followed by swelling of the soft tissue. The swelling subsides, and a painful, firm mass grows in 1 or 2 months. After 1 year, the mass may gradually become smaller. The second type is associated with neurological disorders such as closed head or spinal cord injury.[7] The third type is pseudomalignant myositis ossificans of unknown origins including trauma, which may be confused with malignant tumors.[7,8] The fourth type is a rare genetic disease called fibrodysplasia ossificans progressive, which is characterized by progressive heterotopic ossification at multiple periarticular sites.[7] The present case is probably the third type because of the lack of history of trauma, although we cannot rule out the possibility of the first type secondary to blunt trauma. Therefore, the tumor may be confused with benign or malignant soft tissue tumors.

The differential diagnosis of myositis ossificans includes non-malignant lesions such as nodular fasciitis, juxtacortical osteoma, osteochondroma, and chondroma, and osteoid changes in sarcomas including parosteal or periosteal osteosarcoma.[1,7] Myositis ossificans reveals a distinct zonal pattern reflecting gradations of cellular maturation. The inner regions of the lesion contain immature, rapidly proliferating fibroblasts together with inflammation. The surrounding zone contains poorly defined osteoid trabeculae with fibroblasts and osteoblasts derived from mesenchymal metaplasia. The periphery is characterized by mineralization of the osteoid, and possibly mature lamellar bone.[1,7] In contrast, nodular fasciitis does not contain any cartilaginous or bony component.[1] The other lesions usually present with connections to the underlying bone.[1,7]

CT is sensitive for identifying calcification and ossification.[7] Two general patterns of calcification have been described: a feathery pattern in the periphery and an irregular calcified structure of variable density. Immature osteoid in sarcoma is characterized by much denser central calcification.[7] The mass in our patient appeared as diffuse high density with no peripheral calcification because of immature ossification. Therefore, a distinct peripheral ring of calcification is not always found. Magnetic resonance imaging reveals various characteristics, depending on the histological stage. In the early stage, the lesion is usually isointense on T_1-weighted and hyperintense on T_2-weighted images.[6,7] The signal intensity may change depending on the blood products. Surrounding edema and heterogeneous enhancement are also seen. Therefore, myositis ossificans in the early stage may mimic an aggressive soft tissue neoplasm or inflammatory mass. In the subacute/intermediate stage, a hypointense border corresponding to peripheral calcification is observed. In the late stage, the intensity is decreased, corresponding to the dense

ossification and fibrosis.[6,7]

The initial management of myositis ossificans depends on the stage of development.[1,7] Myositis ossificans circumscripta is usually treated conservatively. Rest and avoidance of additional injury of the muscle should be considered.[1,7] Medication consisting of indomethacin or aspirin is also used.[7] Local excision is recommended only if the patient has pain or restricted motion. Excision is considered when the lesion reaches maturity, usually at 6–12 months, to avoid recurrence. In contrast, excision may be considered for pseudomalignant myositis ossificans (unknown origin) at any time.[7,8] Our patient was in pain and her condition was compatible with this type of pseudomalignant myositis ossificans. Thus, surgical excision was performed.

The present case of pseudomalignant myositis ossificans of the temporal muscle suggests we should be aware of the possibility of myositis ossificans as a scalp tumor and the importance of differentiation from other soft tissue tumors.

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