Myositis Ossificans in the Tip of the Thumb: A Case Report

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GOTO, H., HATORI, M., KOKUBUN, S. and MAKINO, M. *Myositis Ossificans in the Tip of the Thumb: A Case Report.* Tohoku J. Exp. Med., 1998, 184 (1), 67-72 — A case of a myositis ossificans occurring in the distal portion of the finger is reported. An 18-year-old female noticed a small nodule in the tip of the left thumb for 11 months. Plain radiographs showed calcified shadow and there was a radiolucent zone between the mass and the distal phalanx. The excised mass was diagnosed as myositis ossificans. To our best knowledge, there has been no report of a myositis ossificans in the tip of the finger in literature. — myositis ossificans; thumb; radiograph; magnetic resonance imaging (MRI); computed tomography (CT) © 1998 Tohoku University Medical Press

Myositis ossificans is a solitary benign ossifying lesion in the soft tissue. It is often misdiagnosed as an extraskeletal osteosarcoma because of its rapid growth (Fine and Stout 1956). Therefore, it is sometimes called pseudomalignant myositis ossificans (Angervall et al. 1969; De Smet and Vercauteren 1984; Campanacci et al. 1992). Myositis ossificans rarely occurs in the distal portion of the finger. We report a case of myositis ossificans occurring in the top of the thumb.

CASE REPORT

An eighteen-year-old female noticed a small nodule measuring 5×5 mm in the tip of the left thumb after repetitive minor traumas. Eleven months later, she visited a dermatologist and underwent puncture into the tip of the thumb. The nodule rapidly increased in size and pain aggravated. Antibiotics was not effective. She was referred to our clinic.

Initial examination revealed that the distal portion of the left thumb was swollen like a clubbed finger and hard in consistency. There was tenderness on

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the distal portion of the thumb without local redness or heat. Motion of the thumb was not restricted. Laboratory data were normal.

x-Ray examination revealed a calcified shadow in the distal portion of the thumb. There was a radiolucent zone between the mass and the distal phalanx. Periosteal hypertrophy of the phalanx was noted (Fig. 1). Its peripheral region became ossified without a change in its size during the following two weeks. Computed tomographic (CT) scans showed a mass with a clear ossified margin (Fig. 2). Magnetic resonance (MR) imaging revealed a well circumscribed mass with high signal intensity in the peripheral portion and mixed signal intensity in its center on T2 weighted images. The high signal intensity portion was enhanced after injection of gadolinium-diethylene triamine pentaacetic acid on T1 weighted images.

Myositis ossificans was strongly suspected because of its rapid growth and marginal ossification. The differential diagnosis was an extrasosseous malignant

Fig. 1. Plain radiograph of the left distal phalanx of the thumb showing an ossified mass and periosteal hypertrophy of the phalanx.

Fig. 2. CT scan of the left distal phalanx of the thumb showing radiolucent zone between an ossified mass and the phalanx.

bone tumor. Excisional biopsy was performed. There was no continuity between the mass and the distal phalanx. The removed mass was bony-hard. It was covered with the capsule, which was easily peeled off. The mass was gritty in consistency.

Zonal phenomenon and osteoblastic rimming were histologically observed (Fig. 3). There was no nuclear atypia or pleomorphism in osteoblasts. The central portion was vascular fibroblastic tissue. These findings led us to diagnose myositis ossificans. There was no recurrence two years after surgery.

DISCUSSION

There has been confusion in naming of heterotopic ossification in the finger or toe (Nora et al. 1983; Dupree et al. 1986). There has been reported a few heterotopic ossification closely related to myositis ossificans in the finger and toe. Dupree et al. (1986) reported 21 cases of "fibro-osseous pseudotumor of digits,"

Fig. 3. (A) Pathomicrograph of a circumscribed mass showing peripheral bone production with central fibroblastic core (original magnification, $\times 7$; hematoxylin and eosin). (B) Zonation pattern at periphery showing woven-bone forming perpendicularly to surface (H&E). (C) Osteoblastic rimming (H&E).

unlike myositis ossificans because of their localization in the subcutaneous tissue, poorly-circumscribed irregular growth, varied fibroblastic proliferation and absent of zonal phenomenon. Spjut and Dorfman (1981) reported 12 cases of heterotopic

ossification without muscle fibers arising from the periosteum of tubular bones of the fingers or toes. They named it "florid reactive periostitis of tubular bones of hands and feet."

The present case is unique in the following two points. Firstly, the lesion had a typical zonal pattern. In contrast, fibroosseous pseudotumor lacks its orderly zonal pattern and consists merely of an irregular, often nodular mixture of loosely arranged fibroblasts, a prominent myxoid matrix, and deposits of osteoid with osteoblastic rim although it closely resembles myositis ossificans (Enzinger and Weiss 1995). Secondly, it arose in the subcutaneous fatty tissue in the distal portion of the thumb. It is well known that the majority of myositis ossificans originate in muscle tissue (Gilmer and Anderson 1959). Enzinger and Weiss (1995) noted that in heterotopic ossification arising in the subcutaneous fat, the zonal pattern is absent or inconspicuous.

Although there is general agreement that myositis ossificans is a nonprogressive benign process without neoplastic potential, its pathogenesis is still poorly understood (Enzinger and Weiss 1995). Kewalramani (1977) stated that traumatic ossification is related to 1) an immediately reacting group of cells present in periosteal, endosteal, and stromal connective tissue cells; and 2) a slowly reacting cell population present in mesenchymal cells. Angervall et al. (1969) suggested that infection is responsible for non-traumatic myositis ossificans. In the present case, repetitive minor trauma lasting for 11 months and/or hematoma or infection due to puncture might be thought to form an ossified mass in the tip of the thumb.

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