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【 EDITORIAL 】

Clinical Imaging Features of Thyroid Acropachy

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Thyroid acropachy is a rare manifestation of autoimmune thyroid disease presenting clinical symptoms of skin tightness, digital clubbing, small-joint pain, and soft tissue edema (1, 2). Generally, thyroid acropachy and dermopathy occur with thyroid ophthalmopathy and are considered markers of severe ophthalmopathy (3). Exophthalmos, myxedema, and hypertrophic osteoarthropathy comprise the triad known as "EMO" syndrome, which is seen in less than 1% of patients with autoimmune thyroid disease having extrathyroid complications (4). Although the exact etiology of thyroid acropachy is unknown, it is thought to be caused by stimulating auto-antibodies to thyroid-stimulating hormone (TSH) and insulin-like growth factor-1 receptors that are involved in the pathophysiology of Graves' thyrotoxicosis and ophthalmopathy (5). The TSH receptor antibody levels, thyroid-stimulating antibody values, and TSH-blocking antibody values are usually extremely high in patients with EMO syndrome (6, 7).

The radiographic evaluation of the hand in patients with thyroid acropachy usually shows prominent irregular, frothy, spiculated, and fluffy periosteal reaction in the mid-diaphyseal areas of the metacarpals, metatarsals, and phalanges with soft tissue swelling (6, 8). The periosteal reaction is usually seen along the radial side of the first, second, and third metacarpals or metatarsals and the ulnar side of the fourth and fifth metacarpals or metatarsals (6, 8, 9). Furthermore, there is limited involvement of the long bones of the forearms or legs (10). These findings are distinctly different from those of the subperiosteal bone resorption seen in primary parathyroidism, although they are the same subperiosteal reactions (11). It is assumed that these reactions depend on the superiority of bone formation or resorption. One of the presumed mechanisms of thyroid acropachy is increased glycosaminoglycan and fibroblast proliferation, which are activated via autoimmune phenomena (7, 10). Because of these faint brushed or fluffy periosteal reaction of the bones, it is not easy to detect or evaluate the manifestations using radiography alone (12).

Kawashiri et al. reported the usefulness of musculoskeletal ultrasonography for the evaluation of osteoarthropathy in the phalanges of both the hands and toes in a patient with EMO syndrome (13). Taroumian et al. also reported that musculoskeletal ultrasound can detect periosteal bone formation along with a radiographic examination of the hands in thyroid acropachy (14), although there are only few such reports currently. Further sensitivity and specificity analyses should be performed for this evaluation. Technetium-99m pyrophosphate bone scintigraphy, another imaging modality, showed the focal accumulation of the radionuclide in the affected areas in thyroid acropachy (15). Magnetic resonance imaging is also useful for detecting soft-tissue changes around the periosteal reaction associated with thyroid dermopathy (8).

These complementary diagnostic modalities, including musculoskeletal ultrasonography, are useful for evaluating the clinical imaging features of thyroid acropachy. Further case studies demonstrating the effective treatment and novel techniques of diagnostic imaging modalities in thyroid acropachy are warranted to control the extrathyroid complications of autoimmune thyroid disease in the future.

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