

Letter to the Editor (Case report)

Computed tomography-like magnetic resonance images based on T1 spoiled gradient-echo to detect calcinosis in a patient with anti-nuclear matrix protein 2 antibody-positive juvenile dermatomyositis

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Key message

CT-like magnetic resonance images based on T1 spoiled gradient-echo may be useful for evaluating calcinosis in JDM.

DEAR EDITOR, An 11-year-old girl was admitted to our hospital for evaluation of a 6-month history of rash with joint pain affecting the right elbow during the past 2 months. She had no muscle weakness, myalgia or dyspnoea on exertion. Erythematous eruptions were present on the eyelids, midface and extensor surfaces of the fingers, which were suggestive of heliotrope eruption, malar rash and Gottron sign, respectively. These cutaneous findings were highly suggestive of JDM. The extensor surface of the right elbow was swollen and erythematous, on which white nodules appeared only in the flexed position but not in the extended position (Fig. 1A and B). The remaining results of the physical examinations were normal. Blood levels of creatinine kinase and aldolase were elevated at 470 IU/l (reference, 45–163 IU/l) and 14.7 mg/dl (reference, 2.1–6.1 mg/dl), respectively. The results of tests for liver function, renal function, cell blood counts and coagulation were normal. Short tau inversion recovery MRI revealed high signals in fasciae and muscles of both thighs, which was consistent with myositis with fasciitis. Chest radiography and CT showed no abnormal findings. Radiographs of the right elbow revealed calcification in the s.c. region (Fig. 1C). Musculoskeletal ultrasonography showed high echoic lesions in the space between the skin and triceps muscle, with no signs of acoustic shadow (Fig. 1D). Contrast-enhanced T1-weighted MRI of the right elbow revealed an area of abnormal high intensity with contrast enhancement in the s.c. tissues, a finding consistent with inflammation of soft tissue but not calcification (Fig. 1E). However,

CT-like MR images based on T1 spoiled gradient-echo (T1SGRE) showed a high-intensity signal in the s.c. nodules of the right elbow, suggestive of calcinosis (Fig. 1F). Analysis of myositis-specific antibodies was positive for anti-nuclear matrix protein 2 autoantibodies. She was diagnosed with JDM with anti-nuclear matrix protein 2 autoantibody-related calcinosis and treated with CSs and MTX.

Herein, we describe a paediatric case of JDM with anti-nuclear matrix protein 2 autoantibodies presenting with calcinosis at the time of diagnosis. Calcinosis is the deposition of calcium within or under the skin, and it can cause various problems in patients with DM, such as pain, functional disability owing to joint contractures, ulceration and bacterial infection from ulceration; therefore, early diagnosis and careful follow-up are recommended [1]. Calcinosis develops more commonly in younger patients with anti-nuclear matrix protein 2 autoantibodies than in adult patients with DM [2] and is rarely present at the time of diagnosis. The classic location for calcinosis tends to be repeatedly pressured sites, primarily elbows, knees, fingers and buttocks [3, 4], and it can be more visible in the flexed position than in the extended position, as in our case. Calcinosis can also cause local acute inflammation in the surrounding tissue, often resulting in difficulty in distinguishing calcinosis from arthritis. If joint inflammation develops in JDM, clinicians should consider the possibility of soft tissue inflammation owing to calcinosis or arthritis associated with JDM. Given that it is difficult to detect calcinosis only by ultrasonography or conventional MRI methods, calcinosis should be monitored through radiography. However, frequent and repeated assessment of calcinosis using X-rays or CT might lead to unnecessary radiation exposure to the breasts and genitalia. Recently, the usefulness of CT-like magnetic resonance images based on T1SGRE has been reported for the evaluation of various diseases, such as fractures,

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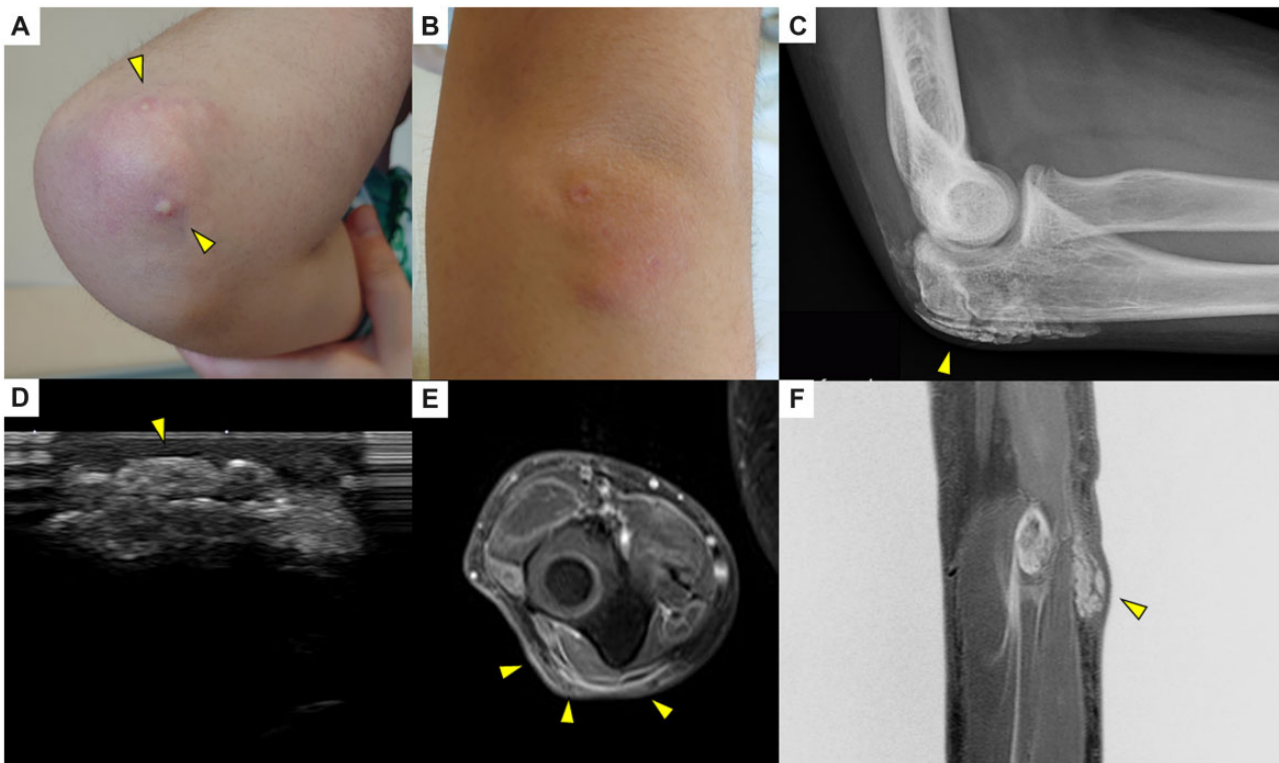


Figure 1. Clinical and radiological images (**A** and **B**) Physical examination shows white papules (arrowhead) on the surface of the right elbow in the flexed position (**A**) but not in the extended position (**B**). (**C**) X-ray image shows calcinosis in the s.c. lesion on the surface of the right elbow. (**D**) Ultrasonography shows high echoic lesions in the s.c. lesion (arrowhead). (**E**) Contrast-enhanced T1-weighted MRI shows high intensity and contrast enhancement of the s.c. lesion in the right elbow (arrowhead), indicating inflammation of the soft tissue, but does not show indications of calcinosis. (**F**) CT-like magnetic resonance image based on T1 spoiled gradient-echo shows a high-intensity signal in the s.c. region of the right elbow (arrowhead), indicating calcinosis

degenerative bone changes, bone tumours and craniosynostosis [5–7], and it allows us to evaluate the lesions of calcinosis harmlessly, especially in juvenile patients, who should avoid radiation exposure. Our case demonstrated that CT-like magnetic resonance images based on T1SGRE might be useful for evaluating calcification in rheumatic diseases without radiation exposure.

Data availability statement

The data supporting the findings of this study are available from the corresponding author, Y.F., upon reasonable request.

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