

Soft Tissue Calcinosis Universalis Visualized with Novel 3-D Computed Tomography Cinematic Rendering

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Calcinosis universalis describes calcific depositions in the skin and soft tissues and can occur in association with connective tissue diseases^{1,2}. The calcifications are thought to be dystrophic, which assumes calcium deposition on the basis of tissue damage. While deposits can be visible on radiographs², computed tomography (CT) may be helpful for the identification of involved tissue layers, monitoring of progression in patients with a large extent of calcium deposits, and evaluation of complications.

A 68-year-old woman with a history of calcinosis universalis resulting from dermatomyositis and systemic sclerosis overlap syndrome presented with right upper extremity pain and cellulitis. The patient was evaluated with contrast-enhanced CT for complications of deeper infection. While there was no evidence of such a complication, CT provided visualization of the extent of tissue calcinosis (Figure 1). Further, a new 3-D visualization technique known as cinematic rendering (CR) was used in addition to traditional 3-D CT methods (Figure 2). CR creates photorealistic 3-D images from standard clinical CT datasets through the application of a lighting model that enhances surface detail and produces shadowing effects that accentuate the relative positions of objects within the imaged volume³. The CR

images showed the relationship of the calcified muscle compartments to the humerus and radius, elbow joint, and neurovascular bundle to better advantage than traditional volume rendering and maximum intensity projection 3-D techniques^{4,5}. While determination of the ultimate utility of CR will require larger-scale comparative studies, this case highlights the potential of this new technique.

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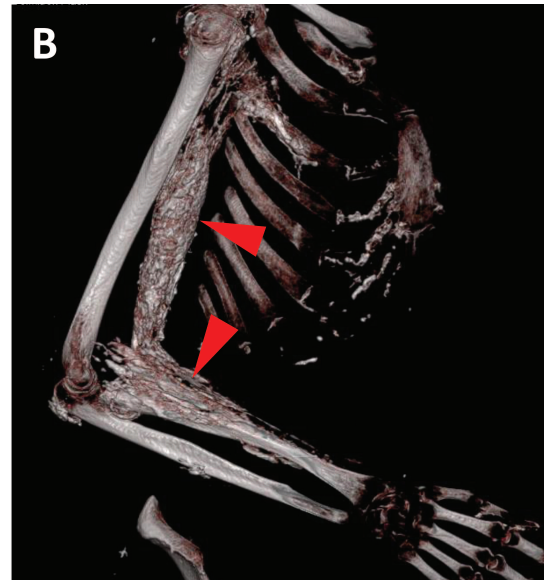


Figure 1. (A) Sagittal, contrast-enhanced 2-dimensional CT image, and (B) volume-rendered 3-D CT image of the patient demonstrating calcinosis (red arrowheads) of the biceps brachii and brachioradialis compartments, and overlying subcutaneous soft tissues. CT: computed tomography.

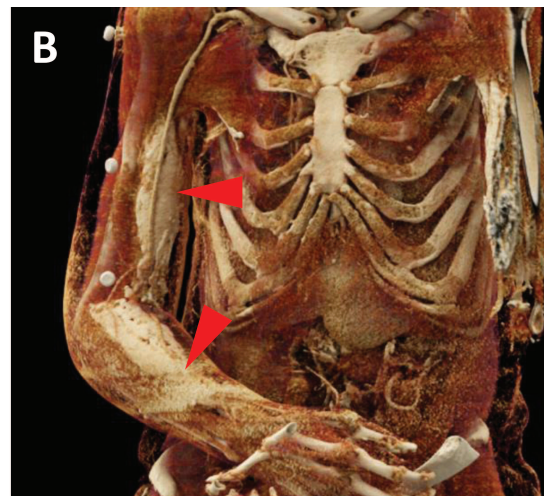
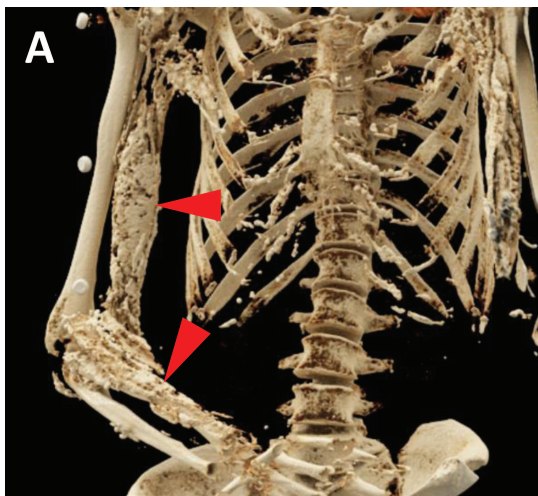


Figure 2. (A-B) Cinematic rendering CT images with varying window width and level settings show the soft tissue calcinosis (red arrowheads) to better advantage owing to photorealistic 3-D effects and shadowing. The greater depth and realism of the cinematic rendering images enhance the visibility of texture within the calcifications to greater detail than the conventional 3-D volume-rendered technique in Figure 1. CT: computed tomography.