

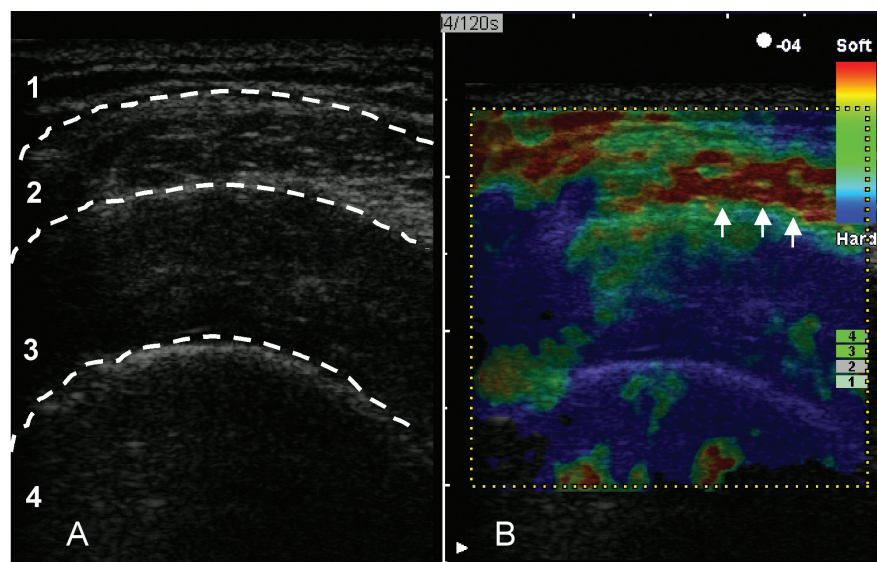
## Sonoelastography can help in the localization of soft tissue damage in polymyalgia rheumatica (PMR)

Sirs,

Sonoelastography is a recently developed ultrasound (US) technique that allows *in vivo* assessment of tissue mechanical properties (1). It measures the changes of tissue radiofrequency impulses before and after the application of gradual manual compression determining local deformation. The elastogram is visualized as a coloured image superimposed on the B-mode image where soft tissues are shown in red whereas hard tissues are shown in blue. This technique has been mainly used to investigate prostatic tumours (2), and breast masses, since carcinoma nodules are harder than fibroadenomas, which are harder than healthy breast tissue (3). To our knowledge, sonoelastography has not been used in the evaluation of musculo-skeletal conditions.

A 73-year-old man was first seen because of sudden onset of pain and stiffness associated with morning stiffness in his hip and shoulder girdles. ESR was 108 mm/h and CRP was 110 mg/dL. Ultrasonography of the shoulder showed a small effusion of the tendon sheath of the left biceps' long head and degeneration of the supraspinatus tendon. This first operator, however, did not recognize enlargement of the subacromial bursae. This finding could be surprising because bilateral bursitis, evaluated by US or MRI, has a sensitivity of 92.9% and a specificity of 99.1% in differentiating PMR from other causes of shoulder pain (4). In spite of absence of bursitis, a diagnosis of PMR was made on clinical grounds, and the patient started treatment with 12.5 mg prednisone daily.

After one month's therapy, improvement was absent with an ESR of 51 mm/h and CRP of 114 mg/dL. Ultrasonography of the shoulder, which also included sonoelastography, was repeated by an experienced musculoskeletal radiologist using a Hitachi LOGOS EUB 8500 system equipped with a 10-6 MHz electronic broadband linear array. Conventional US of the right shoulder (Fig. 1), on the left panel demonstrates a degenerated and enlarged supraspinatus tendon (area 3), which cannot be easily differentiated from the overlying soft tissue (area 4). By contrast, sonoelastography on the right hand panel differentiates the anelastic tendon (blue) from the soft subacromial bursa (red). Doppler US did not show any



**Fig. 1.** US of the right shoulder in a patient with polymyalgia rheumatica. **A:** conventional US showing the humeral head (4), the degenerated supraspinatus tendon (3), the dishomogeneous area of the subacromial bursa (2), and the subcutaneous tissue (1). **B:** sonoelastography showing the soft subacromial bursa in red (arrow), overlying the hard supraspinatus tendon appearing blue with green spots due to tissue of intermediate elastic property.

vascular spot in the area. The dosage of prednisone was increased to 18.75 mg/day with symptoms' remission persisting after two months of steroid tapering.

Subacromial bursitis, which is considered typical of PMR in several studies (4, 5), was present in our patient. Sonoelastography was useful to delineate the bursa, which was difficult to evaluate with conventional US. Colour-Doppler did not help in differentiating the bursa from the surrounding tissues probably because bursitis was chronic. Good definition of the subacromial bursa could also have been achieved by MRI, especially through fat suppression sequences (5). MRI, however, is more difficult to perform and more expensive than US, which is presently the reference imaging technique for several shoulder problems (6).

In summary, we have shown the first implementation of sonoelastography in rheumatology. We feel that sonoelastography could have additional applications in musculoskeletal diseases. Areas of investigation in our centre, in addition to the evaluation of the shoulders of patients with PMR, are the differential diagnosis of nodules, such as tophi and rheumatoid nodules, the investigation of tendon mechanical properties, and the study of muscular diseases.

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