Three-dimensional power Doppler sonography in short-term therapy monitoring of rheumatoid synovitis

SIR, Ultrasound (US) is an invaluable tool in the assessment of the expression of the inflammatory process since it is able to detect minimal amounts of fluid collection, synovial proliferation and bone erosion. Moreover, coupling grey-scale and power Doppler sonography (PDS) it is also possible to evaluate soft tissue perfusion. This kind of information can play a key role in short-term therapy monitoring and appears to be one of the more fascinating fields of research in rheumatology. Standardizing grey-scale US is not an easy task and even more challenging with PDS due to the scattered distribution of synovial hyperaemia.

Three-dimensional (3D) US generates volumetric images containing the entire PDS signal within the acoustic window representing the summation of a virtually infinite number of conventional two-dimensional (2D) images.

The peculiar automatic process of acquisition in 3D US minimizes the margin for error, and therefore renders it a promising imaging tool for the monitoring of synovial perfusion in inflammatory arthritis [1–2]. Figure 1 shows an obvious short-term change in synovial perfusion as depicted by 3D PDS in a patient with severe rheumatoid arthritis receiving biological therapy (adalimumab). These kinds of images can be obtained in a few seconds, even by an unskilled operator, due to the automatic sweep of the transducer.

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