Superb microvascular imaging in giant cell arteritis

Sirs,

We read with interest the paper by Sakellariou *et al*. (1), which aimed to summarise the novelties and further applications of ultrasonography (US) in several rheumatic conditions.

We fully agree with the authors that US is gaining a paramount interest in the field of connective tissue diseases and large-vessel vasculitis (LVV).

Among the new procedures, superb microvascular imaging (SMI) may augment US sensitivity, providing useful information in the detection of low-flow signal.

In this regard, we report our experience in the use of SMI in a patient affected by giant cell arteritis (GCA). A 65-year-old male presented with fever, dry cough and asthenia and blood examination evidenced a marked elevation of markers of inflammation. PET showed diffuse FDG uptake within the territory of aorta and its major branches, while colour Doppler US (CDUS) an intima-media thickening of axillary and subclavian arteries; thus, a diagnosis of GCA was made and the patient treated with tocilizumab and oral steroids. After 6 months, the patient was in clinical and serological remission, but CDUS displayed a slight, persistent, thickening of left axillary artery wall, while SMI evidenced only a single, thin, vessel penetrating the chronically thickened arterial wall (Fig. 1). PET, requested in order to exclude GCA persistent activity, was fully negative and the patient considered in remission.

The optimal monitoring of LVV is still matter of debate, as signs, symptoms and inflammatory markers, the latter particularly during anti IL-6 treatment, may not reflect a concomitant disease activity.

On a physio-pathological point of view, it is well known that inflammation in LVV occurs through *media*, where *vasa vasorum,* increased in numbers and dimensions by angiogenetic stimuli, represent the main entrance door for inflammatory cells (2, 3). For these reasons, several efforts have been made in order to achieve a better spatial definition of the *media,* and to define a reliable tool to assess disease activity. Contrast-enhanced US (CEUS) has been performed in some cohorts of patients affected by LVV (4), displaying an excellent sensitivity and specificity when compared to FDG uptake. Nevertheless, CEUS, being an invasive and time-consuming procedure, is poorly feasible in the common clinical practice.

In this regard, following the interesting evidence coming from the monitoring of atherosclerotic plaques (5), Sato *et al*. (6) employed SMI in a patient affected by active Takayasu's arteritis, detecting carotid intramural vascularization which disap-

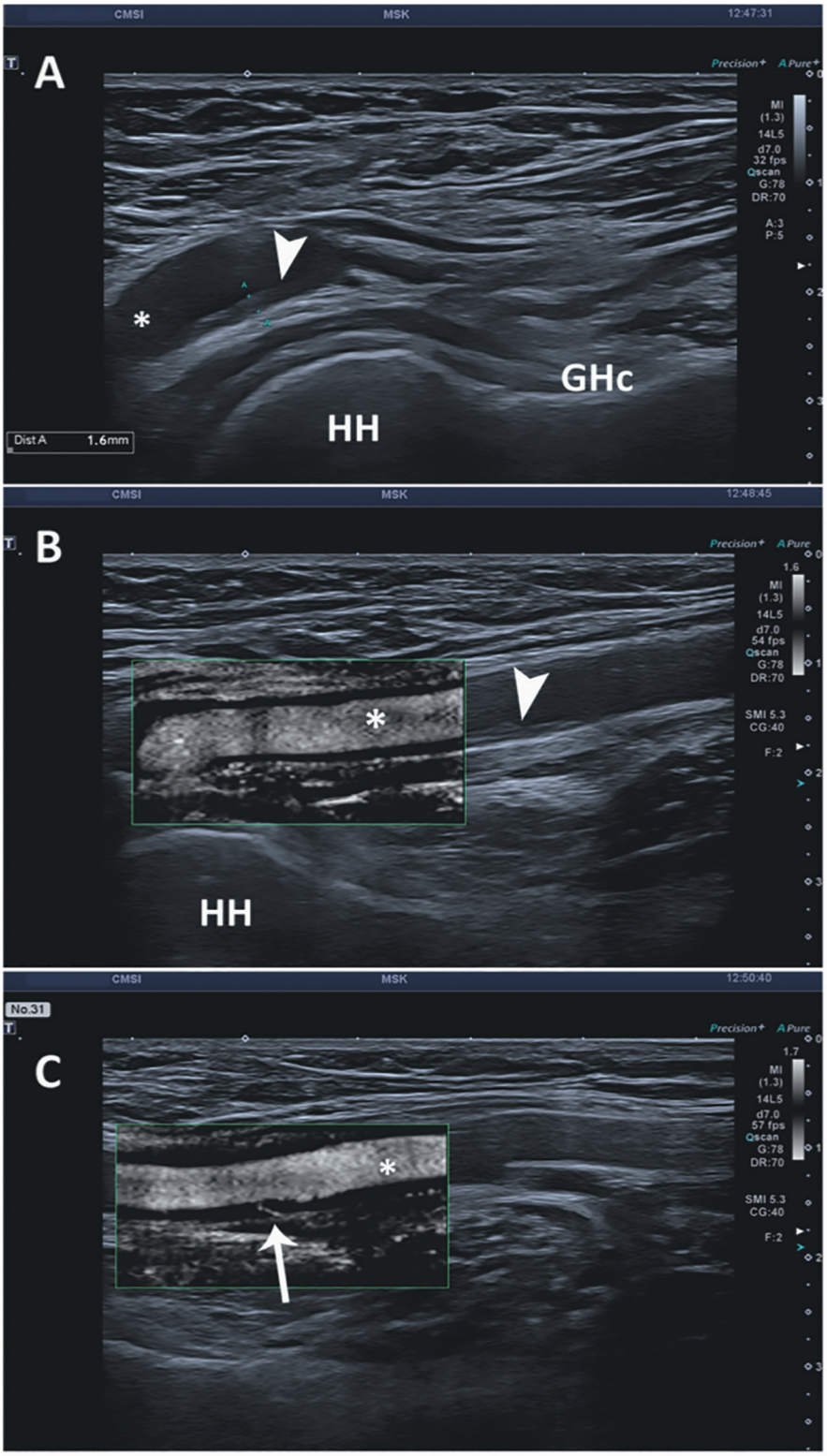

Fig. 1. Sub-axillary scan of left axillary artery (before the emergence of circumflex humeral artery), with a Canon multifrequency linear probe PLT-1005 BT (4–14MHz).

A. Chronic thickening, slightly hypoechoic, of the axillary artery wall (arrowhead), with a pathologic measurement of intima-media thickness (IMT) of 1,6 mm.

HH: humeral head; GHc: gleno-humeral capsule.

B. The application of SMI (into the box) shows blood flow into the axillary artery lumen (asterisk) but absence of flow signals within arterial walls.

C. After a little shift of the probe SMI evidences a single, thin, "vasum vasorum" penetrating the chronically thickened arterial wall (arrow), demonstrating the capability of this imaging tool to detect even this smallest but not pathological vessels. The absence of other flow signal within arterial wall confirms the absence of activity disease in this vessel.

peared after 6 months of treatment; an excellent correlation with PET findings was also found at baseline.

In our experience, we employed SMI in a patient affected by GCA. Differently from what previously reported (7), our patient was in clinical and serological remission, but the persistent intima-media thickening gave the suspicion of vasculitis relapse. The poor SMI vascularisation within the *media*, restricted only to *vasa vasorum*, was useful in the differential diagnosis, suggesting that vessel thickening was presumably secondary to ruling out any disease flare. Such findings were confirmed by PET, which excluded any inflammatory activity and displayed a good concordance with SMI-CDUS.

Our findings are limited by due its singularity and the lack of control (SMI was not performed at baseline) but are the first ones displaying reliability of SMI in GCA patients during follow-up.

SMI may be a potentially useful tool in the assessment of disease activity in patients affected by LVV, being capable of displaying both normal (vasa vasorum) and pathological vascularisation within the media. Further studies should be addressed in order to clarify its reliability in distinguishing between atherosclerotic and inflammatory thickening (4), in predicting the risk of further relapses in case of persistent intramural vascularisation (7) and its correlation with PET findings.

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