The search for improvement in the sensitivity of temporal artery biopsy in giant cell arteritis

Use of colour duplex sonography-guided temporal artery biopsy

GCA is a large and medium-sized blood vessel systemic vasculitis characterized by granulomatous involvement of the aorta and its major branches [1]. It occurs in individuals >50 years of age and more commonly in white people, in particular those of Scandinavian descent [1]. Its incidence increases with age, peaking in the 70- to 80-year-old age group [2]. With progressive ageing of the population in Western countries, GCA is now a relatively common condition.

Colour duplex sonography (CDS) of the superficial temporal artery is considered the imaging modality of choice for the diagnosis of GCA [3]. A hypoechoic halo around the lumen of the temporal artery is a quite specific sign for GCA [4]. Therefore one might wonder whether CDS-guided temporal artery biopsy (TAB) performed at the site of the halo could prevent false-negative histological results and be useful for the diagnosis of GCA. To address this question, Germanò et al. [5] compared CDS-guided TAB with standard TAB in a prospective cohort of unselected patients with suspected GCA. Between September 2009 and December 2012 they enrolled 112 consecutive patients seen at the Rheumatology Unit of the Reggio Emilia Hospital for suspected GCA. Seven patients in whom biopsy failed to sample temporal artery tissue were excluded from the analysis. One hundred and five patients were included in the final analysis: 50 patients in the CDS-guided group and 55 patients in the standard TAB group [5]. The study revealed that CDS-guided TAB does not result in a higher frequency of patients with positive TAB, indicating that CDS is not useful for this purpose [5]. Based on the number of patients included in the study and the quality of the methods, these results are of potential relevance.

Typical cases of GCA involve the cranial arteries, in particular those derived from the external carotid artery, leading classic manifestations such as headache, scalp tenderness or jaw claudication [6]. However, in some patients the diagnosis may constitute a challenge. This may be the case when the presenting manifestation is isolated PMR without any ischaemic manifestation at that time [7]. TAB is considered the gold standard for the diagnosis of GCA [6]. In the presence of elevated acute phase reactants, new features in elderly individuals, such as unexplained pain located above the neck, should prompt us to consider the possibility of GCA and the need for TAB. In a previous study from our group we observed that the presence of abnormalities of the temporal artery on physical examination was associated with a high predictive value for a positive TAB [8]. However, the sensitivity of TAB varies in different studies. Therefore the search for tools that may improve the sensitivity of TAB is of importance in patients with suspected GCA.

Experts in the field agree that in the presence of the halo sign at CDS, the probability of a positive TAB is high [3, 4, 9]. However, according to Germanò et al. [5], a TAB performed at the site of the halo does not seem to provide a greater yield of positive TABs compared with standard TAB. These authors studied patients with evidence of halo at CDS, but the frequency of positive TAB was similar in the two groups. Based on their results, in the presence of a positive halo sign at CDS, the probability of a positive TAB is equally high, regardless of whether the biopsy is guided by CDS or by physical examination [5].

A major issue in reducing the risk of false-negative histological results is the size of the biopsy [6]. The length of the TAB is important in obtaining positive histological findings for GCA [6, 10]. Since TAB with post-fixation length <5 mm carries an increased biopsy-negative rate, longer TAB length is required for accurate diagnosis [10]. To minimize the risk of false-negative histological results, Germanò et al. [5] obtained artery specimens (temporal artery samples) of at least 0.5 cm.

In line with the results of Germanò et al. [5], the same group of investigators previously reported that a positive halo sign around the temporal artery did not improve the likelihood of diagnosing GCA over that provided by a careful physical examination [4]. However, the results of the two studies cannot be compared because the study published in 2002 was conducted by a technician not directly related to the rheumatology department [4]. Nowadays, the rheumatologists from Reggio Emilia have more experience in assessment of the temporal artery by sonography and they perform the sonography themselves with much better equipment than that used in their former study. In any case, despite the potential limitations due to different levels of expertise and different equipment used for the temporal artery US, the halo sign at CDS and temporal artery physical abnormalities appear to be related abnormalities.

One problem with the study by Germanò et al. [5] is the fact that CDS-guided TAB could be useful for only a small subgroup of patients. In fact, only four different sites are available for biopsy, i.e. both distal frontal and both distal parietal branches. Many sonography exams show
pathology in all four sites. Furthermore, guidance is impossible if US is negative.

Thus the data reported by Germanò et al. [5], rather than reducing the potential usefulness of CDS in making a diagnosis of GCA, highlight the relevance of an adequate clinical examination preceding TAB in patients in whom GCA is suspected.

However, these results do not elucidate whether it is still worthwhile to do CDS of the temporal artery, as it does not seem to improve the sensitivity of TAB in making a diagnosis of GCA [5]. Another question derived from the Germanò et al. study [5] is whether we should do a TAB in patients in whom the temporal artery is positive on CDS. With respect to this, we support the histological confirmation of vasculitis, as patients with GCA require corticosteroid therapy for at least 1 year. In any case, the search for additional tools that may increase the sensitivity of TAB is warranted.

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Miguel A. González-Gay, Trinitario Pina and Ricardo Blanco

Division of Rheumatology, Hospital Universitario Marques de Valdecilla, University of Cantabria, Santander, Spain.

Correspondence to: Miguel A. González-Gay, Rheumatology Division, Hospital Universitario Marques de Valdecilla, IFIMA, Avda. de Valdecilla, s/n, 39008 Santander, Spain. E-mail: miguelaggay@hotmail.com

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