

Doppler ultrasound and giant cell arteritis

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Objective: To evaluate the utility of ultrasound in aiding the diagnosis of giant cell arteritis (GCA), in monitoring the response to corticotherapy, and in detecting early relapses.

Methods: A pilot study, prospective, included 10 patients with suspected GCA. All patients underwent ultrasound examination of both temporal arteries before temporal artery biopsy (TAB), 3 weeks after starting treatment, and 3 months after diagnosis. For this study, the histological findings alone were used to define if patients were suffering from GCA. The findings on ultrasound were compared with the results of biopsy. The best place to perform TAB was observed by ultrasound.

Results: All patients with positive biopsy were detected with ultrasound. No false positives were observed on ultrasound. The results presented give a sensibility, specificity, and positive predictive value of 100% for the use of ultrasound in the diagnosis of GCA. Two relapses were detected early by ultrasound during the follow-up.

Conclusions: This pilot study suggests that eco-doppler may be a useful tool in diagnosis and clinic follow-up in patients with suspected GCA.

Keywords: giant cell arteritis, ultrasound, temporal artery biopsy, optic nerve

Giant cell arteritis (GCA) is an ophthalmological emergency that sometimes poses a diagnostic challenge. Its most serious complication is irreversible visual acuity loss secondary to ischemic optic neuropathy that may become bilateral within a few days or weeks if a prompt diagnosis and treatment are not established.¹ Traditionally, histopathological confirmation based on a temporal artery biopsy (TAB) has been regarded as the gold standard. In recent years, non-invasive imaging techniques such as high-resolution color Doppler ultrasound (CDU) have been applied in an attempt to overcome the limitations of TAB,² which is an invasive technique with complications (0.5%) fundamentally in the form of auriculo-temporal branch damage and skin necrosis, and offers only moderate sensitivity (70%–90%). In effect, 10%–30% of all patients with GCA remain undiagnosed with TAB, due to the involvement of other extracranial branches of the carotid, failure to biopsy the affected trajectory owing to the patchy inflammation of the vessel, or failure to actually biopsy arterial tissue. Temporal artery CDU is able to identify three characteristic ultrasound features: 1) A periluminal hypoechogenic halo reflecting arterial wall edema (Figure 1); 2) Segmental arterial stenosis (Figure 2); 3) Arterial luminal occlusion in severe cases. The most specific finding (85%–100%) is the periluminal halo, though the latter is scantily sensitive when isolatedly compared with the histological findings

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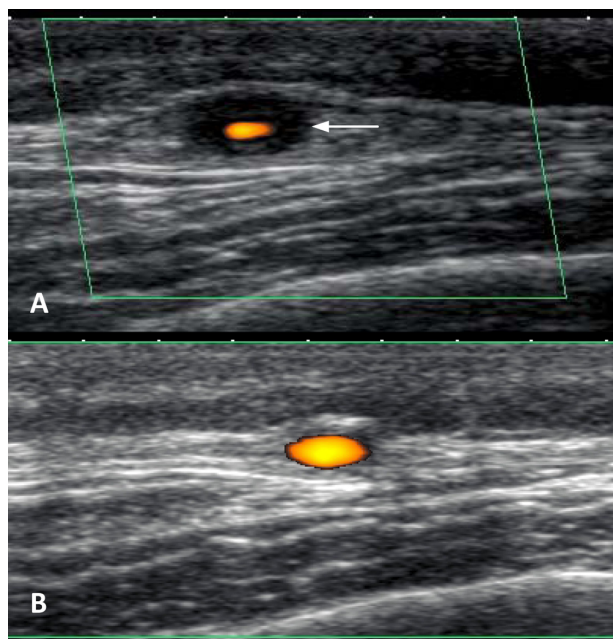


Figure 1 **A)** Cross-sectional Doppler ultrasound view of the right temporal artery. The arrow shows the hypoechoic halo sign. **B)** Image 3 weeks after treatment, showing disappearance of the halo.

and clinical criteria. However, the sensitivity increases to 95%–100% on considering all three ultrasound features.^{3,4}

We have begun a prospective pilot study with 10 cases, performing CDU (TOSHIBA APLIO XG, with a PLT-1204BT high-resolution probe at 18 MHz) prior to TAB, after 3 weeks and after 3 months, to evaluate the usefulness of this imaging technique in GCA. The CDU was performed by the same user within the first three days after initial high-dose steroid administration. The TAB was accomplished along the temple, the day after CDU. The study series consisted of 4 males and 6 females, with a mean age of 76.5 years. CDU revealed some compatible sign in 6 cases (halo = 6, stenosis = 5, occlusion = 2) – the biopsy diagnosing GCA in all of them. In the 4 cases with negative CDU findings, the biopsy also proved negative. Two relapses were detected early by ultrasound during the follow-up, with a recurrence of halo sign detected. In our experience, CDU prior to TAB increases the diagnostic yield, because it is able to identify



Figure 2 Longitudinal Doppler ultrasound view. Note the important narrowing of the arterial lumen due to vasculitic edema of the wall, with multiple stenotic areas.

the best biopsy target segment. After starting treatment, the patient response can be evaluated using CDU, based on the course of the ultrasound signs together with the clinical and laboratory test responses. In addition, CDU is able to detect disease relapse.

Thus, CDU may be useful in application to the initial diagnosis and follow-up of patients with GCA, in view of its innocuous nature, reproducibility, and 100% correlation to the TAB findings in our series. Negative result in CDU could be used to spare biopsies. However, at present, we do not believe that CDU (with the risk implied by false-negative findings and user dependence) can fully replace TAB; rather, the two techniques complement each other. Prospective studies involving larger patient samples and longer follow-up, at least 2 years⁵ are needed to corroborate these findings.

Disclosure

No conflicts of interest were declared in relation to this paper.

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