Analysis of factors that determine the diagnostic yield of temporal artery biopsy

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\textbf{ABSTRACT}

Purpose: To analyze the diagnostic yield of temporal artery biopsy in the diagnosis of giant cell arteritis, and to correlate these results with the clinical and laboratory features which indicate it, in an attempt to increase the efficiency of this technique and try to "save biopsies".

Methods: A retrospective cohort study including suspected giant cell arteritis cases in which a temporal artery biopsy was performed. The data recorded included demographic, clinical and laboratory information.

Results: A total of 38 patients were analyzed. The biopsy was positive in 68.42\% of cases. Multivariate analysis revealed visual symptoms and a high C-reactive protein as parameters with a high diagnostic efficiency.

Conclusions: Our study supports the fact that temporal artery biopsy should be undertaken when there is strong clinical suspicion. Visual symptoms and high C-reactive protein are considered as high efficiency indicators to biopsy.

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Factores modificadores de la rentabilidad de la biopsia de arteria temporal

\textbf{RESUMEN}

Propósito: Analizar la rentabilidad diagnóstica de la biopsia de la arteria temporal (BAT) en la arteritis de células gigantes (ACG) y correlacionar su resultado con hallazgos clínicos y analíticos que establecen la indicación para aumentar la rentabilidad diagnóstica de esta técnica y valorar posibles parámetros «ahorradores de biopsias».

Métodos: Estudio de cohortes retrospectivo de casos con sospecha de ACG en los que se realizaron BAT. Se recogieron datos demográficos, clínicos, analíticos.

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Resultados: Se analizaron datos en 38 pacientes. La biopsia fue positiva en el 68.42% de los casos. En un análisis multivariante se determinaron los síntomas visuales específicos y la proteína C reactiva (PCR) como predictores de una BAT positiva con significación estadística. Conclusiones: Nuestros datos apoyan que el diagnóstico de ACG mediante la BAT debe basarse en una alta sospecha clínica. Los síntomas visuales y PCR elevada destacan en nuestra serie como parámetros con alta rentabilidad diagnóstica.

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Introduction

Giant cell arteritis (GCA) is the most frequent systemic vasculitis in adults. Its most severe complication is anterior ischemic optic neuropathy which can become bilateral in a few days in the absence of early diagnostic and treatment.¹ Temporal artery biopsy (TAB) is considered to be the diagnostic gold standard despite a high rate of false negatives (10–30%).² This emphasizes the importance of good clinical indications.

The objective of this paper is to review the parameters establishing the indication of TAB in order to optimize said procedure.

Subject, material and methods

A descriptive cohort retrospective study was performed in patients with suspected GCA. The TAB was carried out by 2 surgeons between April one, 2004 and January 30, 2010 in the Ophthalmology Service of the La Fe Hospital.

The collected variables were demographic (age, sex), clinical (predominant symptom, evolution time), analytical (acute phase reagents) as well as the TAB results and the definitive diagnostic.

The section selected for the biopsy was the frontal branch of the superficial temporal artery at the level of the temples. A positive biopsy was taken to be that showing internal elastic fragmentation with inflammatory infiltrates in the arterial wall, with or without the presence of giant cells. The positive and negative results were analyzed to determine the parameters having the highest diagnostic optimization rate.

Results

Overall, 38 patients were included in the study: 76.3% of females (29/38) and 23.7% of males (9/38). The mean presentation age was 76.84 years and 67.7 in the positive and negative TAB groups respectively. GCA diagnostic was confirmed in 27 cases (71.05%), with TAB being positive in 26 cases (68.42%). A patient with negative TAB after 6 months of low dosage corticoid therapy and excellent clinical response to treatment was taken to be a false negative. Patients with positive TAB exhibited short-term duration of symptoms (59 against 70 days), although this difference was not statistically significant (p < 0.01. Mann–Whitney). ESR was measured in all patients and it was greater than 50 in 80.77% of positive TAB and in 50% of negative TAB. CRP was determined in 34.21% of patients (13/38) and was high in 84.61% of cases. In all the cases in which CRP was greater than 9, TAB was positive. In the 2 cases in which it was normal, 50% were TAB positive and 50% TAB negative. None of the patients had normal CRP (below 9) and positive TAB. The baseline characteristics of the patients are shown in Table 1.

The predominant symptomatology indicated by the biopsies is shown in Table 2. The patients who were not diagnosed with DCA exhibited a broad range of diagnostics, which are summarized in Table 3. The statistical analysis (Table 4) of positive and negative TAB groups shows that specific visual symptoms exhibit significant differences (p = 0.007) and CRP (p = 0.008).

Table 1 – Baseline characteristics of patients included in the study.

<table>
<thead>
<tr>
<th></th>
<th>TAB+ (n = 26)</th>
<th>TAB− (n = 12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Females (n/total)</td>
<td>(21/26) 80.77%</td>
<td>(8/12) 66.6%</td>
</tr>
<tr>
<td>Age (mean, range)</td>
<td>76.84 years (54–89)</td>
<td>67.7 years (39–78)</td>
</tr>
<tr>
<td>Symptom evolution time (mean, range)</td>
<td>59 days (3–89)</td>
<td>70 days (2–111)</td>
</tr>
<tr>
<td>ESR over 50</td>
<td>80.77%</td>
<td>50%</td>
</tr>
<tr>
<td>CRP over 9</td>
<td>100%</td>
<td>50%</td>
</tr>
<tr>
<td>CRP: C reactive protein; ESR: erythrocyte sedimentation rate.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2 – Temporal artery biopsy results based on main symptom.

<table>
<thead>
<tr>
<th>Symptom</th>
<th>TAB+</th>
<th>TAB−</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporal headache (n = 18)</td>
<td>61.1%</td>
<td>38.8%</td>
</tr>
<tr>
<td>Specific visual alteration (n = 14)</td>
<td>92.85%</td>
<td>7.15%</td>
</tr>
<tr>
<td>Constitutional syndrome (n = 3)</td>
<td>33.3%</td>
<td>66.6%</td>
</tr>
<tr>
<td>Normocytic-normochromic anemia (n = 2)</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Others (n = 1)</td>
<td>0%</td>
<td>100%</td>
</tr>
</tbody>
</table>

2 cases in which it was normal, 50% were TAB positive and 50% TAB negative. None of the patients had normal CRP (below 9) and positive TAB. The baseline characteristics of the patients are shown in Table 1.

The predominant symptomatology indicated by the biopsies is shown in Table 2. The patients who were not diagnosed with DCA exhibited a broad range of diagnostics, which are summarized in Table 3. The statistical analysis (Table 4) of positive and negative TAB groups shows that specific visual symptoms exhibit significant differences (p = 0.007) and CRP (p = 0.008).

Table 3 – Diagnostics in the negative temporal artery biopsy group.

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>TAB− (n = 12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonspecific headache</td>
<td>4/12 (33.3%)</td>
</tr>
<tr>
<td>Cerebrovascular accident</td>
<td>2/12 (16.6%)</td>
</tr>
<tr>
<td>Osteoarticular pain</td>
<td>1/12 (8.3%)</td>
</tr>
<tr>
<td>Bladder tumor</td>
<td>1/12 (8.3%)</td>
</tr>
<tr>
<td>Other diagnostics</td>
<td>3/12 (0.25%)</td>
</tr>
<tr>
<td>Probable GCA diagnostic</td>
<td>1/12 (8.3%)</td>
</tr>
</tbody>
</table>

GCA: giant cell arteritis; TAB: temporal artery biopsy.
Table 4 – Variables predicting positive biopsy.

<table>
<thead>
<tr>
<th>Variable</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific visual alteration</td>
<td>0.007</td>
</tr>
<tr>
<td>High CRP</td>
<td>0.008</td>
</tr>
</tbody>
</table>

Statistical test: Mann–Whitney.
CRP: C reactive protein.

Discussion

The percentage of positive TAB in our series is high (68.42%) compared to other published series, with the TAB positive and TAB negative groups being comparable in the duration of symptoms and pre-TAB treatment time.

In our series, visual symptoms and high CRP are associated to positive TAB with statistical significance, with the constitutional syndrome being not an efficient indicator and normochromic normocytic anemia being the predominant symptoms. These findings differ from other published series which give more value to cranial symptoms such as headache, jaw claudication or abnormal palpation of the temporal artery. In GCA, CRP and ESR are typically high. Parikh et al. pointed out that both high values exhibit a diagnostic sensitivity of 99.2%. In our series, in the cases with high ESR and CRP, all the biopsies except one were positive. Patients with positive TAB had high CRP, considering this value more specific than ESR to predict positive TAB. The results of our study confirmed the idea that carrying out TAB without clear clinic and analytic indications increases the probability of obtaining a negative result.

In summary, diagnostic of GCA by means of TAB requires high clinical and analytical suspicion with a predominance of visual symptoms and high CRP.

Conflict of interest

No conflict of interest has been declared by the authors.

References