Temporal artery biopsy: impact on the clinical management of patients

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Abstract

Objectives Temporal artery biopsy (TAB) is requested in an attempt to confirm the diagnosis of temporal arteritis (TA). Patients symptoms and signs are highly variable and TA is often focal and potentially missed in a small biopsy. The study aimed to determine if TAB helps in the management of patients with suspected TA.

Methods The case records of sixty-six consecutive patients who had undergone temporal artery biopsy were recalled and examined for presenting symptoms, management, therapy, results and outcome.

Results There were 23 men and 43 women with a mean age of 70.2 and 71.1 years respectively. Presenting symptoms varied with unilateral headache in 53, scalp tenderness in 16, muscle weakness in 10, visual disturbance in 16, jaw claudication in 5 and peri-orbital pain in 1 patient. The temporal artery was tender in 21 patients and thickened in 4 patients. Thirty-eight patients were commenced on steroids prior to biopsy and 6 more before the histology became

available. Only 8% of biopsies were positive for TA. Of the patients started on steroids with a negative biopsy, the steroids were continued in 26 and stopped in 9. In the patients not put on steroids [22], biopsy was positive in 2; they were commenced on steroids. Therefore, the histological diagnosis resulted in a change in patient management in only 18% of patients.

Conclusion The results of TAB do not appear to affect the clinical management of most patients with suspected temporal arteritis. We must therefore question the routine use of this invasive investigation.

Introduction

Temporal arteritis (TA) or giant cell arteritis (GCA) is an uncommon condition affecting 18/100 000 of the population over the age of 50 [1]. It is rare under the age of 50 and appears to have a distinct racial and geographical distribution [2]. TA is most common in females with a female to male ratio of 3–5 to 1. Headache is the most common symptom and may be accompanied by scalp tenderness [3, 4]. Claudication of the muscles of mastication is another specific symptom occurring in approximately 40% of patients [5]. The associated ophthalmic arteritis can be devastating, leading to blindness if untreated [6]. The clinical diagnosis of TA may be difficult because of the varied presenting symptoms [7]. Inflammatory markers such as erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) are usually elevated, but are non-specific. The histology of TA is characteristic and generally regarded as the ‘gold standard’ for diagnosis, however, its need is debated [8].

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Histology typically shows a granulomatous inflammatory infiltration of the temporal artery. The changes are however patchy along the vessel wall (skip lesions) thus the need for a 2cm or greater length of artery and multiple histological sections for a diagnostic biopsy [9–11].

The aim of this study was to examine the role of temporal artery biopsy in the diagnosis and management of patients with suspected TA.

Methods

The case records of sixty-six consecutive patients who had undergone temporal artery biopsy over a five year period were recalled and examined. Clinical and demographic data were recorded including details of the presenting symptoms and signs, investigations, pre-operative treatment and changes in management resulting from the histological findings. Data was recorded on a standard proforma for each patient.

Results

There were 23 men and 43 women with a mean age of 70.2 (range 36–95) and 71.1 (range 41–88) years respectively. The presenting symptoms varied, with headache being the most frequent. The temporal artery was tender in 21 patients and thickened in 4 patients. The ESR was measured in all patients although the CRP was measured in only 19. The ESR was over 100 mm/hr in 9 patients and 50–100 mm/hr in 24 patients. In the remaining patients the ESR was within the normal range. Of the 19 patients who had CRP measured, three (16%) had positive biopsies. Their CRP's were 300, 59 and 9mg/L (the remainder ranging from <2–117mg/L).

Only 5 (8%) patients had positive biopsies and all were over 70 years old. Unilateral frontal headache, temporal artery tenderness and an ESR greater than 50 mm/hr were each present in 4 of the 5 patients. The fifth patient had an ESR of 9, but was on long-term steroid therapy for rheumatoid arthritis. In 22 patients, steroids were withheld until the result of the biopsy was known; two of these patients had a positive biopsy and steroids were subsequently commenced. Thirty-eight patients had already been started on steroids prior to biopsy. In 4 of these patients the steroid therapy was long-term. A further 6 patients were started on steroid therapy after biopsy but before the histology result was available. In only 3 out of this group of 44 patients were the biopsy results positive. Of the 41 patients with a negative biopsy the steroids were stopped in 10 patients. Thirty-one patients continued steroid therapy on clinical grounds. Therefore the histological diagnosis resulted in a change in patient management in only 12 (18%) patients (Fig. 1).

Discussion

There is conflicting information in the literature on the validity, sensitivity, and specificity of various systemic symptoms and signs of TA. Hayreh [12] prospectively investigated 363 patients referred with a diagnosis of TA, finding a positive temporal artery biopsy in 106 (29%). The odds of having a positive temporal artery biopsy were 9 times greater in patients with jaw claudication and 2 times greater when the patients were aged 75 years or over. Duhaut [13] examined a series of 207 biopsy proven TA patients, and compared them with 85 patients with negative biopsies. Fifty-eight per cent of the biopsy proven cases, compared with 39% of the negative biopsy cases, were diagnosed during the autumn or winter ($p = 0.003$). Visual problems (31.5%, v 19.1%, $p = 0.031$), blindness (9.7% v 2.38%, $p = 0.033$), jaw claudication (40.8%, v 28.243%, $p = 0.044$), and temporal artery palpation abnormalities (61.3% v 29.5%, $p < 0.005$) were more frequent in the biopsy proven group. Although usually thought to support a diagnosis of temporal arteritis, headache (82.5% v 92.9%, $p = 0.021$), or associated polymyalgia rheumatica (40.1% v 65.9%, $p < 0.00009$) were more prevalent in the negative biopsy cases in this series.

The ESR is a useful but non-specific test. It has been shown that values exceeding 100 mm/hr have a 90% predictive value for serious underlying disease, most often infection, collagen vascular disease, or metastatic tumour [14]. Therefore ESR is a useful confirmatory test in patients with a suggestive history but it is not always elevated at diagnosis [15]. The odds of having a positive temporal artery biopsy are 3.2 times with CRP > 2.45 mg/dL, 2.0 times with ESR 47–107 mm/hr and 2.7 times with ESR > 107 mm/hr [12]. The CRP would seem therefore to be a more useful test than ESR, but was measured in only 29% of our cases.

The American College of Rheumatology defined five diagnostic criteria for giant-cell arteritis (GCA): age 50 or more years, new onset localised headache, tenderness or decreased pulse of the temporal artery, raised ESR of ≥ 50 mm/hr and histological evidence of granulomatous inflammation within the temporal artery [5]. Three of these criteria provide a diagnosis with 93.5% sensitivity and 92.1% specificity. Others have shown that the clinical criteria of over 70 years of age, with a new onset headache and an abnormal temporal artery examination have a sensitivity of 44% and specificity of 93% for GCA [16]. If jaw claudication is also present the sensitivity decreases to 26.7%, but specificity increases to 100% [16]. This implies that in some cases a certain clinical diagnosis of GCA can be made.

Colour Duplex Ultrasound is a non-invasive, quick and cheap, diagnostic technique that has been employed in some centres for the diagnosis of TA. Schmidt et al [17, 18] demonstrated that 73% of patients with TA had a dark halo around the lumen of the temporal arteries on ultrasonography. This possibly represents oedema. This halo was

Fig. 1 Flowchart summarising the results of temporal artery biopsy

reported to be 73% sensitive and 100% specific for TA. It was also shown that the halo disappeared in most patients 14 days after commencing steroid therapy [17].

The rate of a positive temporal artery biopsy in published series is highly variable, but ranges from 5% to 34% [19, 20]. Figures for the UK tend to be at the lower end of this range. These may reflect the average biopsy length taken. In the UK this is approximately 1cm [21]. Hall et al from the Mayo Clinic [20] averaged 4cm for their biopsies and adopted a policy of frozen section and contralateral biopsy if initially negative. Their positive biopsy rate was 34% even with this aggressive policy.

Although the selection criteria for biopsy are often not stated, the implication of these figures is that they must vary. Allsop et al [8] suggested that temporal artery biopsy should be reserved for patients who fail to respond promptly to steroid therapy, or those in whom steroid therapy is strongly contraindicated. This is the 'trial of steroid therapy' policy. The rate of positive biopsies in our series was low (8%). All patients with positive biopsies were elderly (>70

years). Unilateral headache, a tender temporal artery and a high ESR appear to be important markers in our series. It would be necessary to examine a larger series of patients with positive biopsies to develop more rigid selection criteria for biopsy.

It is important to note that despite a negative biopsy, 75% of patients remained on steroid treatment on clinical grounds. This underscores not only the difficulty in accurately diagnosing TA but also the devastating consequences that may result from failure to treat. Although we acknowledge that there is a false negative rate in the reporting of temporal artery biopsies, if the diagnosis is felt to be secure on clinical grounds the biopsy could have been omitted. If not, it would suggest that the steroids should be stopped in these patients. The results of temporal artery biopsy do not appear to impact on the clinical management of most patients with suspected temporal arteritis. We must therefore question the routine use of this invasive investigation.

With this in mind we would advocate a cautious approach to temporal artery biopsy and would suggest the

following: Patients should be started on high dose steroid therapy as soon as the diagnosis is suspected. If on clinical grounds the patient has classical symptoms and signs of TA then there is no need for biopsy to prove the diagnosis. Even if the biopsy is negative the management of these patients will not change. If the patient has a weak story for TA then we would advocate a trial of steroids and a regular review of the case, progressing to biopsy if doubt remains. For the remaining patients we would again recommend a trial with steroids and offer temporal artery biopsy at one week if still deemed necessary on clinical grounds. Achkar et al [22] have demonstrated that corticosteroids have little effect on the histological diagnosis within the two-week timeframe. This approach is intended to reduce the number of negative and unnecessary temporal artery biopsies. We would be keen to encourage the use of colour Doppler sonography as an alternative to biopsy and to further validate this method.

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