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The role of temporal artery biopsies in giant cell arteritis

CG Davies, DJ May

Department of Surgery, Southampton General Hospital, Southampton, UK

ABSTRACT

A knowledge of the disease process of giant cell arteritis and its diagnosis can help a surgeon to decide which patients will benefit from a biopsy being performed and identify where a biopsy would be of no value in their management. This article discusses the issues involved.

KEYWORDS

Giant cell arteritis – Temporal artery biopsy

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CORRESPONDENCE TO

CG Davies, Department of Surgery, Southampton General Hospital, Tremona Road, Southampton SO16 6YD, UK
E: christopher.davies50@btinternet.com

General, vascular and ophthalmic surgeons are often called upon to perform a temporal artery biopsy in order to help in making the diagnosis of giant cell arteritis. Arranging for an urgent temporal artery biopsy is not always straight-forward logistically with the onus usually on the operating team to arrange for admission to a day-care unit. A knowledge of the disease process of giant cell arteritis and its diagnosis can help a surgeon to decide which patients will benefit from a biopsy being performed and identify where a biopsy would be of no value in their management.

Giant cell arteritis (GCA) is an inflammatory disease of blood vessels, most commonly large and medium arteries of the head. It is a form of vasculitis. The terms giant cell arteritis and temporal arteritis are often used interchangeably. It can involve other large vessels such as the aorta. Giant cell arteritis of the temporal artery is referred to as temporal arteritis.

GCA is the most common form of systemic vasculitis in adults and affects predominantly older individuals of north European descent with an average annual incidence of 18.8 cases per 100,000 persons over 50 years of age. The incidence rises steadily after age 50 years and is highest between 70–80 years of age. GCA is two to four times more common in women compared to men.[1,2]

Symptoms can vary and depend on which arteries are affected. Most commonly they include: (i) headache in about two-thirds of cases, typically in temporal areas; (ii) tenderness of the scalp directly over the temporal artery; (iii) pain in the jaw when eating or talking in about half of cases; and (iv) visual disturbances – either partial or complete loss of vision effects in 20%.

Complications of untreated giant cell arteritis can be catastrophic and so diagnosis needs to be made promptly and treatment started as early as possible. Complications include blindness or partial loss of vision; this occurs in up to 20% of those with untreated giant cell arteritis. Loss of vision is usually irreversible despite treatment. Other serious complications of giant cell arteritis relate to the artery which is affected and may include myocardial infarction, aortic aneurysm or stroke.

The diagnosis of GCA should be considered in a patient over the age of 50 years who presents with new onset of headache, visual disturbances or jaw claudication.

The American College of Rheumatology (ACR) 1990 criteria for the classification of GCA are listed in Table 1. For the diagnosis of GCA, at least three of the five criteria must be present which yields a sensitivity of 93.5% and a specificity of 91.2% for distinguishing GCA from other forms of vasculitis.[5]

It is clear that a temporal artery biopsy comprises only 1 point from a possible 5 points in order to make the diagnosis of temporal arteritis. It has been shown in a study of 111 temporal artery biopsies that 75 (67.5%) of these cases already had an American College of Rheumatology score of 3 or greater before a biopsy was performed and so the biopsy should not have affected management.[4]

The result of a temporal artery biopsy is not always rapidly available. Given the nature of complications of giant cell arteritis, treatment is instituted or discontinued before biopsy results are available in 60–86% of cases.[4,5] Temporal artery biopsies are not without complications and difficulties. These have included unintended biopsies of veins and nerves,[6] postoperative haematoma, scalp necrosis, wound

Table 1 1990 Criteria for the classification of giant cell (temporal) arteritis[3]

Criteria	
Age at disease onset ≥ 50 years	Development of symptoms or findings beginning at age 50 years or older
New headache	New onset of or new type of localized pain in the head
Temporal artery abnormality	Temporal artery tenderness to palpation or decreased pulsation, unrelated to arteriosclerosis of cervical arteries
Elevated erythrocyte sedimentation rate	Erythrocyte sedimentation rate ≥ 50 mm/h by the Westergren method
Abnormal artery biopsy	Biopsy specimen with artery showing vasculitis characterised by a predominance of mononuclear cell infiltration or granulomatous inflammation, usually with multinucleated giant cells

infection, damage to the facial nerve, and drooping of the eyebrow.

Temporal artery biopsies can yield false negative results of up to 7%;[5] this can be due to skip lesions[7] and may result from corticosteroid use in the treatment of GCA. The longer the duration of treatment before biopsy, the fewer positive results there will be.[8] Positive biopsy specimens may be found following corticosteroid treatment for GCA.[7,9]

It has been advocated that to improve the diagnostic sensitivity for GCA, bilateral temporal artery biopsies should be performed. A positive biopsy specimen was found in 5% of those who had a normal temporal artery biopsy from the opposite side.[10]

Given the invasive nature of a temporal artery biopsy and the limitations of its sensitivity, studies have been carried out to investigate whether a different modality could be used to look for evidence of GCA. Colour duplex ultrasonography has been shown to yield similar results to temporal artery biopsy.[11] This looks for a characteristic inflammatory halo around the affected artery or a segmental stenosis. It can be performed bilaterally and can be performed along the artery which may reduce the chance of false-negative yield associated with skip lesions.

The diagnosis of GCA is clinical. It is reinforced with temporal artery biopsy. By using the American College of Rheumatology scoring system to aid in the clinical diagnosis of GCA, the number of temporal artery biopsies needing to be performed can be reduced thus allowing earlier treatment and preventing associated morbidity from a temporal artery biopsy. Temporal artery biopsy should be reserved for those with an ACR score of 2, that is those in whom the biopsy result will truly affect the patient's management.

The role of temporal artery biopsy in the diagnosis of GCA may be nearing its end with the use of colour duplex ultrasonography but at the moment the limited availability of this may well mean that some biopsies will still be required.

Positive biopsy has a specificity of 100%. Because of this, by definition it is the gold standard of diagnosis of temporal arteritis. However, it has a poor sensitivity when compared with clinical diagnosis with a false-negative rate reported as high as 44%.[12] In clinical practice, a temporal artery biopsy is rarely the factor that establishes the diagnosis of temporal arteritis, although it continues to be widely advocated. Careful clinical evaluation is essential. Clinical evaluation may be the most accurate diagnostic technique; information from biopsy adds to diagnostic yield only in a minority of cases.

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