Annals of Medicine and Surgery 11 (2016) 47–51

Contents lists available at ScienceDirect

Annals of Medicine and Surgery

journal homepage: www.annalsjournal.com

The impact of temporal artery biopsy on surgical practice

Adam Thomas Cristaudo [a, b, *], Ryo Mizumoto [a], Rasika Hendahewa [a]

[a] Department of General Surgery, Caboolture Hospital, QLD, 4510, Australia
[b] Westmead Research Centre for Evaluation of Surgical Outcomes, Department of Surgery, University of Sydney, Westmead Hospital, Westmead, NSW, 2145, Australia

HIGHLIGHTS

- TAB remains the gold standard test for diagnosing GCA.
- This study aims to determine the impact of TAB on current surgical practice.
- TAB alone is an expensive procedure with a low positive yield.
- Recent evidence suggests promising results with USS in diagnosing GCA.

ARTICLE INFO

Article history:
Received 6 July 2016
Received in revised form
16 September 2016
Accepted 18 September 2016

Keywords:
Temporal arteries
Giant cell arteritis
Ultrasonography
Magnetic resonance imaging
Positron-emission tomography

ABSTRACT

Background: Giant cell arteritis (GCA) has the potential to cause irreversible blindness and stroke in affected patients [1–4]. Temporal artery biopsy (TAB) remains the gold standard test for GCA [6–8]. Recent literature suggests that TAB does not change management of patients with suspected GCA and that ultrasound scan (USS) may be sufficient enough alone to confirm the diagnosis [9–11,13]. The aim of this study is to therefore determine the impact of TAB on current surgical practice and emergency theatre services.

Materials and Methods: A retrospective clinical study was performed of patients who had undergone TAB at the Caboolture Hospital from January 2010 to September 2015. Demographic and clinical data was collected from patient's medical records in regards to GCA.

Results: A total of 55 TAB were performed on 50 patients. Only two TAB were positive for GCA. Thirty-eight (76%) patients had a pre-TAB ACR criteria score of ≥3. Pre-operative corticosteroids were administered in forty-five (90%) patients, on average 4 ± 10 days pre-TAB. Mean time to TAB was 1.6 ± 1.6 days following their booking. Ninety-one percent of TAB were performed by surgical registrars. All TAB were performed using local anaesthesia alone.

Conclusions: TAB is an expensive procedure with a low positive yield. Recent evidence suggests promising results with USS in diagnosing GCA. With the exceedingly low positive TAB results found in this study, patients with suspected GCA should be investigated in accordance with the above algorithm. The routine use of USS will reduce the number of negative TAB performed.

1. Background

Giant cell arteritis (GCA) is a systematic vasculitis that affects large and medium sized arteries [1,2]. It has the potential to cause irreversible blindness and stroke in affected patients who do not receive prompt steroid therapy [3,4]. The American College of Rheumatology (ACR) criteria has 5 points, of which any 3 are required for a diagnosis of GCA to be made (Table 1) [5]. This has a sensitivity of 94% and specificity of 91%. Temporal artery biopsy (TAB), however, remains the gold standard test for GCA (specificity: 100%; sensitivity: 15–40%) [6–8].

TAB is primarily performed by the inpatient surgical team in order to confirm a histopathological diagnosis in a patient with suspected GCA. However, by the time patients are referred for a TAB, most have fulfilled ≥3 of the ACR criteria needed to clinically diagnose GCA.

* Corresponding author.
E-mail addresses: adamcristaudo@bigpond.com (A.T. Cristaudo), ryo.mizumoto@uqconnect.net.au (R. Mizumoto), rasika.hendahewa@health.qld.gov.au (R. Hendahewa).

http://dx.doi.org/10.1016/j.amsu.2016.09.004

Table 1
ACR criteria scoring system for diagnosis of GCA [5].

ACR criteria	Points
Age over 50 years	1
Erythrocyte sedimentation rate (ESR) > 50 mm/h	1
Superficial temporal artery tenderness	1
Temporal (lateralised) headache	1
Positive histology of a temporal artery biopsy	1

Recent literature suggests that there is now enough evidence that TAB does not change the management of GCA and that the use of imaging modalities, such as ultrasound scan (USS) and cranial magnetic resonance imaging (MRI) may be sufficient to confirm the diagnosis [9–12].

The aim of this study is to determine the impact of TAB on current surgical practice and emergency theatre services, as well as its associated procedural costs. We also explore recent evidence that is emerging in regards to the use of USS to confirm diagnosis of GCA as opposed to TAB.

2. Materials and Methods

A retrospective clinical study was performed by identifying patients who had undergone TAB at the Caboolture Hospital from the 1st of January, 2010 to the 30th of September, 2015. Patients were identified by the Caboolture Hospital Operating Room Management Information System co-ordinator. Cross-checking was performed with Medical Records using International Coding of Disease version 10 codes M31.5 (GCA with polymyalgia rheumatica) and M31.6 (other GCA) to identify any further patients suspected of GCA who may (or may not) have undergone TAB in order to obtain a true representation of the whole cohort of GCA patients.

All TAB were performed on the side where pathology (i.e. tenderness over the temporal artery; headache) was present. Each case was performed after obtaining informed consent from the patient in the operating theatre using local anaesthetic (1% lignocaine). On occasion, the superficial temporal artery was marked out with ultrasound in the hospital's radiology department prior to surgery. A surgical consultant (i.e. Fellow of the Royal Australasian College of Surgeons) was present as either the primary operator or first assistant to the surgical registrar (i.e. non-accredited or accredited trainee of the Royal Australasian College of Surgeons). Once the local anaesthesia was infiltrated into the skin of the temporal region (and the patient was appropriately prepped and draped), an incision was made, anterior to the tragus, in the vertical plane. Skin and subcutaneous tissue were incised until the temporo-parietal fascia was reached. The vessel was identified within this fascia and dissected to reveal 3–5 cm of the vessel. This was clamped and an appropriately sized (1–2 cm) specimen excised and sent in formalin for histopathological examination. The clamped ends were ligated with 3/0 silk ties and haemostasis was ensured. The temporo-parietal fascia was closed with 3/0 multifilament sutures and the skin closed with 3/0 monofilament subcuticular sutures.

All patients who underwent TAB were commenced on oral Prednisolone 50 mg daily upon suspicion of GCA by the treating Medical Consultant. All patients were then followed-up in the relevant Medical Consultant's Outpatient Department clinics within two weeks for review of their histopathology and response of their symptoms to the prescribed corticosteroids. Patients who had a good response (i.e. subjective relief of symptoms; improvement in inflammatory markers) to the prescribed corticosteroids and/or a positive TAB on histopathology had their therapy slowly tapered over the next 6 months. Patients who had a little or no response to the prescribed corticosteroids and/or a negative TAB on histopathology had their therapy more abruptly ceased.

Data was collected from patient's medical records and stored on a secure and encrypted Microsoft Excel database. Patient's details including age and sex were recorded. Extensive clinical data was also obtained. This included the side the TAB was performed on, the length of the TAB specimen, erythrocyte sedimentation rate (ESR), presence of a new headache in the temporal region, and presence of tenderness over the affected temporal region (to fulfil ACR diagnostic criteria). It was also recorded whether pre-operative corticosteroids were given and for how many days prior to TAB, the dose of initial prednisolone given and subsequent regime, and whether the patients symptoms were responsive to treatment. Whether the TAB was performed by a surgical registrar or consultant surgeon was recorded. It was also noted if the TAB was performed under a local anaesthetic or a general anaesthetic. TAB specimens were examined by a senior consultant pathologist at a central laboratory.

A Kendall's tau-b correlation was performed to determine the relationship between each individual ACR diagnostic criteria and TAB results using IBM SPSS Statistics for Windows, Version 22.0 [12]. Quantitative variables were also presented to ascertain the procedural costs for performing TAB in the setting where there was not a dedicated emergency theatre service available.

3. Results

A total of 55 TAB (on 50 patients) were performed from the 1st of January, 2010 to the 30th of September, 2015. The mean age was 70 ± 13 years. Thirty-six (66%) TAB were performed on females, while nineteen (35%) TAB were performed on males. All patients admitted to hospital during the study period with suspected GCA underwent TAB.

Of the 55 TAB performed, only 2 (3.6%) specimens were reported as positive for GCA (both were female) (Fig. 1). Four (7.2%) specimens were reported as insufficient sample size (i.e. specimens <10 mm; three of these being from same patient), one (1.8%) specimen yielded a vein and one (1.8%) specimen yielded a peripheral nerve. The remaining 47 (86%) specimens reported as negative for GCA; four (7.2%) of which showed age-related changes, one (1.8%) showing degenerative changes.

Twenty-one (38%) TAB specimens that were above the accepted cut off length of 1–2 cm (mean TAB specimen length: 0.9 ± 0.5 cm). Thirty-six (66%) TAB were taken from the left temporal artery, while nineteen (35%) TAB were taken from right temporal artery. Two (4%) patients had bilateral TAB, while the other forty-eight (96%) had unilateral TAB. One (2%) patient had three attempts at a TAB (all left-sided) that were unfortunately unable to yield representative sample size for histopathological examination (all specimens were 6 mm in length).

The mean ACR criteria score was 3 ± 1. Prior to their TAB, thirty-

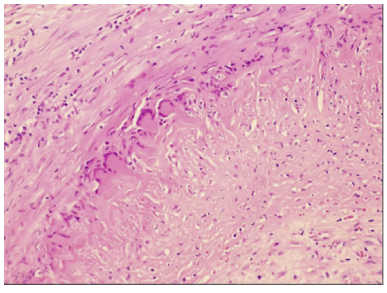

Fig. 1. High-power view of a positive TAB specimen shows disruption of the intima with a collection of multinucleated giant cells.