



Transient speech impairment: a minor stroke/TIA case escaping conventional imaging methods

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Abstract

This case report discusses the diagnostic challenges posed by transient ischaemic attacks (TIAs) and minor strokes presenting with atypical symptoms, focusing on a 62-year-old male presenting with isolated speech difficulties reminiscent of Broca's aphasia. Despite initial inconclusive imaging, subsequent evaluation revealed minor periventricular changes consistent with ischaemic small vessel disease and a pre-existing lacunar infarct. The resolution of symptoms within 10 days highlights the transient nature of the event. The case underscores the importance of recognising nuanced presentations of cerebrovascular events and the necessity for standardised diagnostic criteria and assessment tools for transient speech impairments resembling Broca's aphasia. Further research into the mechanisms underlying these transient events, utilising advanced imaging techniques, such as diffusion-weighted MRI (DWI), may be warranted to facilitate early recognition and appropriate management in clinical practice.

Keywords: Broca's aphasia; expressive aphasia; transient ischaemic attack; minor stroke

Introduction

Minor stroke and transient ischaemic attack (TIA) often pose diagnostic dilemmas, particularly when presenting with atypical symptoms like speech impairment, amidst inconclusive imaging findings. This ambiguity underscores the need for clarifying the definitions of minor strokes and TIAs. While TIAs by definition last less than 24 h, prolonged symptoms lasting up to 2–3 weeks, in the absence of acute imaging abnormalities, may denote a minor stroke [1]. The term 'acute ischaemic cerebrovascular syndrome' occasionally encompasses both TIA and minor stroke, but the distinction between them lacks clinical significance, as diagnostic and management strategies remain akin, with no indication for thrombectomy or thrombolysis [1]. Isolated speech difficulties, although rare (incidence of 5.1%), warrant attention in minor strokes or TIAs; however, features characteristic of Broca's aphasia are infrequently observed [2]. Recognition of such nuances amidst cerebrovascular events is pivotal for precise diagnosis and prompt intervention, underscoring the pivotal role of clinical acumen in navigating diagnostic uncertainties.

Case report

A 62-year-old Caucasian male, farmer by profession, presented to the emergency department (ED) accompanied by his son-in-law, complaining of speech difficulties. He reported a gradual

onset of speech problems over the preceding week, characterised by word-finding difficulties and an inability to express himself adequately. There were no associated symptoms of limb weakness, headache, visual disturbances, chest pain, palpitations, or dysphagia reported. The patient's medical history was unremarkable, with no history of smoking or alcohol consumption.

Upon clinical examination, the patient appeared alert and oriented with an abbreviated mental test-4 (AMT-4) score of 4/4. He exhibited hesitant and non-fluent speech, struggling to find appropriate words during conversation suggestive of Broca's aphasia (expressive aphasia). The remainder of the neurological examination was within normal limits, with intact reflexes and cranial nerves.

Due to suspicion of a cerebrovascular event, a computed tomography (CT) scan of the brain was conducted in the ED, revealing no acute abnormalities. Routine blood tests (Table 1) and electrocardiogram (ECG) results were unremarkable. Following consultation with the specialist stroke team, the patient was transferred to a stroke services-equipped facility for further assessment.

Subsequent magnetic resonance imaging (MRI) of the brain, performed within 6 days of symptom onset and 3 days after initial presentation in the ED, indicated minor periventricular high signal changes consistent with ischaemic small vessel disease. Additionally, an incidental finding of previously established lacunar infarct in the left caudate nucleus was identified, although no

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Table 1. Investigations results for the patient showing urea and electrolytes and lipid profile.

Test Name	Units	Normal range	Results
Urea	mmol/l	2.5–7.8	9.7
Creatinine	umol/l	59–104	116
Glucose	mmol/l	3.0–6.0	5.5
Cholesterol	mmol/l	< 5.2	4.7
Triglycerides	mmol/l	< 1.7	3.0
HDL	mmol/l	> 1.0	1.0
LDL	mmol/l	< 2.6	2.3
non-HDL Chol	mmol/l	< 3.4	3.7
Total HDL	mmol/mmol	No standard reference range	4.7
HbA1C (IFCC)	mmol/mol	20–41	36
Haemoglobin	g/l	132–170	138
C-Reactive Protein	mg/l	0–5	2.2

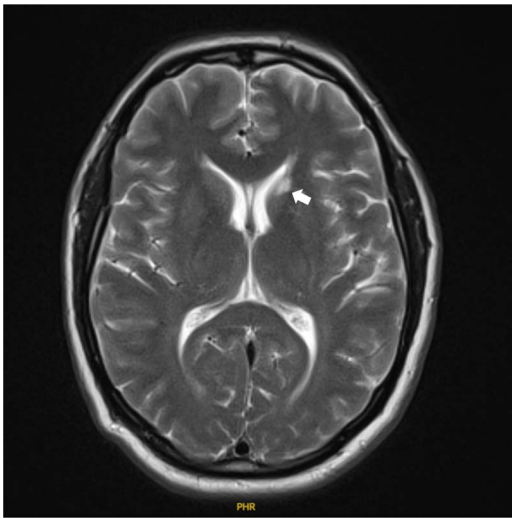


Figure 1. Axial view MRI Brain showing established infarct in the left caudate nucleus (white arrowhead). Note the absence of any acute lesion in Broca's area despite the patient's presenting symptoms of expressive aphasia.

acute infarct or intracranial abnormality was observed. Notably, there was no involvement of Broca's area on the MRI scan, despite the presence of an established lacunar infarct, which had never previously manifested (Fig. 1).

Further evaluation included a carotid doppler study, revealing a 37 × 6 mm area of soft atheromatous plaque within the right common carotid artery (CCA). Moreover, no significant carotid artery stenosis was identified on the scan (Fig. 2).

Despite the absence of acute stroke findings on imaging, the patient's clinical presentation and imaging results were consistent with a minor stroke or TIA. Following discharge, the patient exhibited complete resolution of speech difficulties upon follow-up in the clinic after four days (i.e. within 10 days of initial symptoms). He was subsequently prescribed clopidogrel 75 mg indefinitely, in addition to a statin, after completing a 14-day course of 300 mg aspirin daily for secondary prevention.

Discussion

The presentation of this case with prominent features of expressive aphasia, commonly known as Broca's aphasia, initially raises

suspicion of a Broca's area stroke. Although data on the precise incidence of pure Broca's aphasia is limited, findings from two trials involving 4141 patients with transient ischaemic attack (TIA) or minor stroke suggest an incidence of approximately 5.1% [2]. Anatomically, Broca's area comprises Brodmann's areas 44 and 45 within the dominant hemisphere's frontal lobe. This region serves as the locus for speech production within the brain's language processing network. Individuals experiencing functional deficits in this area typically exhibit challenges in producing grammatically correct and fluent speech [3].

In the context of our case, the notable symptom of non-fluent, hesitant speech aligns closely with the hallmark characteristics of Broca's aphasia [4]. However, despite these clinical indicators, further imaging studies including CT and MRI scans revealed no evidence of acute infarction within the Broca's area. This absence suggests either a transient vascular compromise that did not manifest as a radiologically confirmed infarct or an alternative cerebrovascular event mimicking expressive aphasia in our patient. The transient nature of the patient's speech impairment, which resolved within 10 days of symptom onset, further supports the notion of a temporary vascular disturbance that spontaneously resolves.

The differential diagnosis for isolated speech impairment includes various types of aphasia, among which anomic aphasia is notable. Anomic aphasia, characterised by difficulty in word finding with fluent speech, differs from non-fluent aphasia, where speech is non-fluent and hesitant [5]. In this case, the patient's presentation of non-fluent speech and word-finding difficulties initially suggested a Broca's aphasia (Expressive aphasia). However, the possibility of anomic aphasia should also be considered, especially if future cases present with similar speech difficulties but without the non-fluent characteristic. Accurate diagnosis between these types of aphasia is crucial, as the underlying aetiology and management may differ. Transient isolated speech impairment, as observed in this case, poses diagnostic challenges, necessitating comprehensive evaluation. In our case, the absence of acute infarction on conventional MRI also highlights the potential utility of using advanced MRI modalities such as diffusion-weighted MRI (DWI) which offers higher sensitivity and specificity and enables earlier detection of acute ischaemic changes that are otherwise missed by conventional MRI sequences [6]. However, our experience underscores the imperative for the establishment of standardised diagnostic criteria and assessment tools tailored specifically for identifying and evaluating cases of transient speech impairment

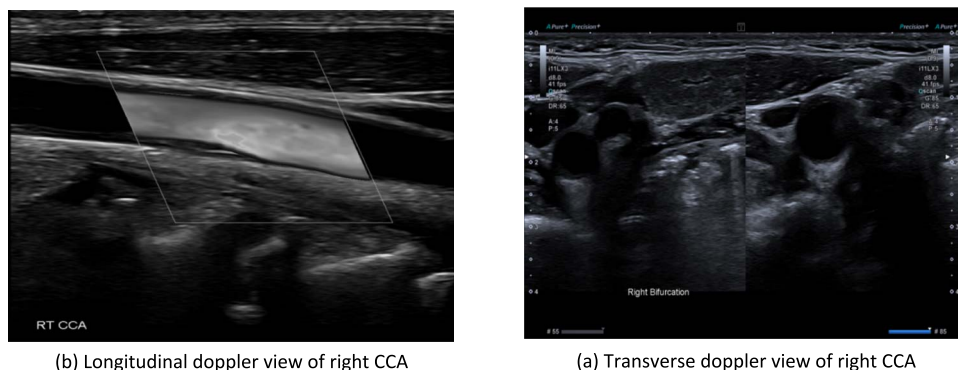


Figure 2. Carotid doppler images demonstrating atheromatous plaque within the right common carotid artery (CCA). (a) Longitudinal view showing a 37 × 6 mm area of soft atheromatous plaque in the right CCA. (b) Transverse view of the right CCA illustrating the extent of the atheromatous plaque. Note the absence of significant carotid artery stenosis in both views.

resembling Broca's aphasia. Such standardisation would facilitate early recognition and appropriate management of these cases in clinical practice.

Moreover, there is a pressing need for further investigation into the underlying mechanisms of transient cerebrovascular compromises leading to isolated speech impairment without radiological evidence of infarction. Advanced imaging modalities, including functional MRI and diffusion tensor imaging, hold promise for elucidating subtle vascular changes associated with these transient events [7]. A deeper understanding of these mechanisms is essential for refining diagnostic strategies and optimising therapeutic interventions for patients presenting with similar clinical manifestations.

Consent

Informed and written consent from the patient was taken before publication.

Guarantor

Sheharyar Hassan Khan.

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Conflict of interest

No conflicts of interest.

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Ethical approval

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