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Case Report

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It's All in the History

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Abstract

We discuss the case of an 84-year old left-handed lady who presented to the emergency department with dysphasia, for whom CT neuroimaging showed a left-sided, posterior intraventricular meningioma. A closer analysis of the temporal profile of symptoms from the history unmasked dual underlying pathologies, the second of which was acute ischaemic stroke, which was subsequently confirmed on MRI. We highlight several learning points from this clinical case and emphasize the crucial importance of revisiting the clinical history when interpreting neuroimaging and constructing appropriate differential diagnoses.

Case Presentation

An 84-year old left-handed lady was brought to the emergency department with dysphasia. The stroke physicians reviewed her shortly after arrival and as a CT head scan had revealed a left-sided intraventricular, homogeneously enhancing mass (Figure 1), a stroke was thought unlikely; she was subsequently referred to the neurology team.

Figure 1: Contrast-enhanced CT brain scan (axial section) showing an avidly enhancing, homogeneous, left-sided posterior intraventricular mass. CT – Computed Tomography

We reviewed her with her husband present, who had helped clarify the history. For one month, she had experienced gradually progressive episodic word-finding difficulties and occasionally said 'nonsense words.' This occurred in association with mild, episodic, left-sided temporal, featureless headaches, but with no other neurological symptoms. Importantly, they had noted a sudden, profound deterioration in language production and interpretation, which started one day prior and had prompted admission. There was no weakness and no reported visual or bulbar disturbances. With the exception of gastro-oesophageal reflux disease, for which she was on oral lansoprazole 15mg once daily, and gallstones, past medical and drug histories were otherwise unremarkable. She had never smoked, consumed minimal alcohol, was driving and remained independent with her activities of daily living.

On examination, there was a predominantly expressive dysphasia with a receptive component. She had right-sided visual and tactile sensory inattention, and a mild tandem gait ataxia. The remainder of the neurological examination was normal and there was no papilloedema. The scalp was non-tender and both temporal arteries were pulsatile. Chest auscultation demonstrated a pan-systolic murmur, loudest at the apex, but breath sounds were normal. Abdomen and calves were soft and non-tender. She was systemically well with no peripheral stigmata of endocarditis and vital signs were normal.

The following bloods were normal: full blood count, urea and electrolytes, liver function, bone profile, C-reactive protein, and plasma glucose. A 12-lead ECG and chest X-ray showed normal sinus rhythm and mild cardiomegaly with clear lung fields, respectively. A gadolinium contrast-enhanced MRI brain scan (Figure 2A-D) confirmed a homogeneously enhancing left-sided meningioma and no haemorrhage. Although radiological evidence of stroke was initially not reported, we reviewed the diffusion-weighted imaging (DWI) and Apparent Diffusion Co-efficient (ADC) sequences (Figures 2C and 2D) given our high index of suspicion of stroke (*sudden* deterioration in language manifesting as expressive and receptive dysphasia). Indeed, there was evidence of restricted diffusion within the left inferior parietal region, which supported acute ischaemic stroke. The patient was commenced on aspirin 300mg orally once daily, a statin and referred via the stroke pathway. Carotid Doppler imaging was subsequently normal and a transthoracic echo showed a posterior mitral valve prolapse.

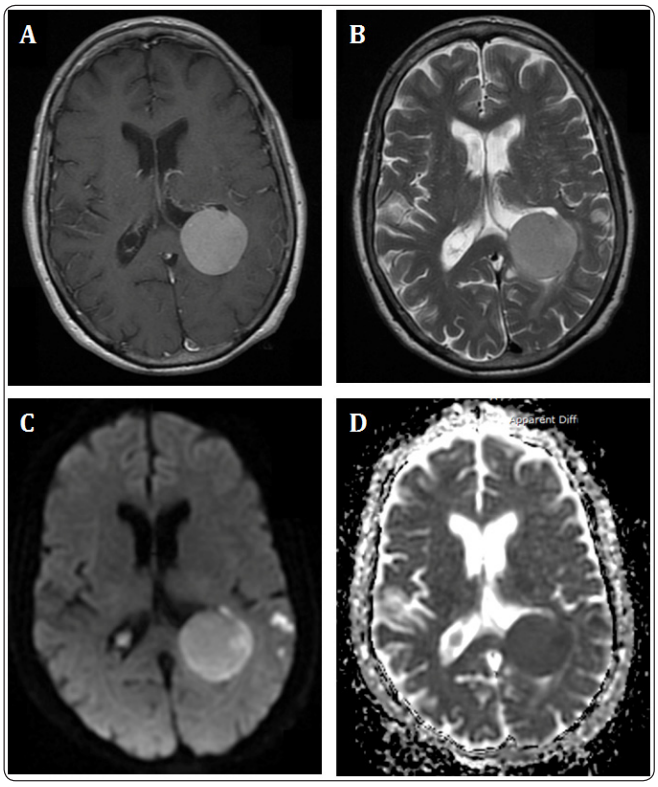

Figure 2: Axial sections of a gadolinium contrast-enhanced MRI brain scan. **A and B)** T1-weighted and T2-weighted sequences, respectively, showing a well-demarcated uniformly enhancing meningioma distending the posterior horn of the left lateral ventricle. **C and D)** DWI and ADC sequences, respectively, showing restricted diffusion within the left inferior parietal cortex, consistent with an infarct. MRI - Magnetic Resonance Imaging. DWI – Diffusion-weighted imaging. ADC – Apparent Diffusion Co-efficient.

Discussion

We believe this case highlights several important learning points. Patients can have dual (or more) pathologies, which bring to mind Hickam's dictum (a counter-argument to Occam's razor and principle of parsimony): "Patients can have as many diseases as they damn well please" [1]. The formulation of a diagnosis should not refrain clinicians from making more, particularly if the story doesn't robustly fit a singular one. The presence of a slow-growing meningioma would be expected to produce a gradual progression of symptoms. This neoplasm may have explained the patient's one-month history of progressive word-finding difficulties, and maybe her headache, but not the sudden profound deterioration in language– a vascular cause most likely accounted for the latter.

Up to 73% of left-handers display left hemispheric language dominance, so although the left-sided meningioma may have explained the patient's dysphasia, and right-sided inattention, the history helped unmask both underlying pathologies [2]. The DWI and ADC images confirmed restricted diffusion, suggestive of infarction, within the left inferior parietal cortex. Despite the profound sudden decline in expressive and receptive language function the patient had experienced, the volume of infarction seemed relatively modest. Extensive evidence from neuroimaging studies, namely large-scale structural and functional connectivity analyses have shown that the inferior parietal lobe (particularly the angular gyrus) represents a key network hub that interconnects multiple cortical domains sub-serving different sensory, motor and higher associational modalities [3-6]. Thus, this clinical-radiological discrepancy can be explained by this representing a strategic infarction, given the critical role the inferior parietal lobe plays in the processing of language [7,8].

Sudden neurological deficits maximal or near maximal at onset is a stroke until proven otherwise, which remains a clinical diagnosis [9]. The sensitivity of a non-contrast CT head scan for acute ischaemic stroke is as low as 40% and a normal scan should not prevent the diagnosis of stroke being made. Although MRI brain scans, specifically DWI sequences, have greater sensitivities for acute ischaemic strokes than CT, this is still not bullet-proof [10,11]. A recent meta-analysis revealed a pooled-prevalence of DWI-negative acute ischaemic strokes of 6.8%, although posterior ischaemic strokes had five times the odds of DWI-negative scans than anterior territory ischaemic strokes [11]. Thus, it is important not to restrict emphasis to the findings of the clinical examination and initial CT (or even MRI) neuroimaging, but to revisit the history when formulating the appropriate differential diagnoses.

Conclusions

The history represents the cornerstone of the practice of clinical medicine and arguably contributes the greatest information towards making a sensible diagnosis. This is particularly crucial in the case of stroke and outlines the importance of clarifying the precise spatiotemporal pattern of events that triggers presentation to healthcare providers. However, with increasing access to advanced investigative and neuroimaging modalities, it can be easy to lose grasp of the paramount importance of clinical acumen and the traditional art of history taking.

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SE drafted the initial manuscript and subsequent revisions. MR: Manuscript revisions. Written consent was obtained from the patient.

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