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Isolated infarct of the corpus callosum: About a case

Sara Habib Chorfa, Soumia El Graini, Kenza Sidki, Firdaous Touarssa, Mohamed Jiddane

ABSTRACT

We report here the case of an isolated corpus callosum (CC) infarct in a 48-year-old woman. Characteristics of this unusual condition are illustrated by magnetic resonance imaging (MRI). We discuss the clinical signs of this rare entity and the more important differential diagnoses.

Keywords: Corpus callosum, Infarct, MRI

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INTRODUCTION

Infarctions of the corpus callosum (CC) are most often associated with cortical or subcortical ischemic damage [1]. Although its frequency is not precisely known, the occurrence of an isolated infarction of the corpus callosum is a rare event. This rarity makes its recognition difficult, especially since imaging aspects can be misleading and lead to diagnostic errors or invasive procedures [2].

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The study of the corpus callosum is always done, initially, in the median sagittal plane, in a T1 or T2 weighted sequence depending on the team. The search for restriction of diffusion, neovascularization on perfusion imaging, and tumor spectrum can be of decisive help. Tractography is of interest in malformative anomalies, traumatic damage, and tumor [1].

The objective of this work is to present the imaging appearance of an isolated infarction of the corpus callosum, to consider the main differential diagnoses and to discuss the clinical particularities.

CASE REPORT

We report here the case of an isolated corpus callosum infarct in a 48-year-old woman with a history of arterial hypertension and hyperlipidemia, hospitalized for sudden onset crural monoparesis with mutism. The clinical examination showed anterograde amnesia, temporospatial disorientation, right hemiparesis, and frontal syndrome (dysexecutive syndrome with impaired judgment, urinary incontinence). There was no impairment of the cranial pairs. The brain MRI showed a subacute infarction of the corpus callosum on complete occlusion of the right distal branches of A2 (Figure 1A–E).

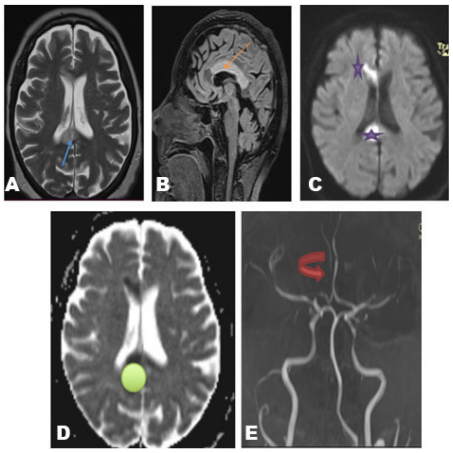

Figure 1: (A, B) (blue and orange arrow): Range in T2 hypersignal and flair with diffusion restriction (C: purples stars) and low apparent coefficient diffusion (ACD) (D: green circle) of the right cingulate gyrus and the trunk of the corpus callosum related to subacute infarction. On the 3D time of flight (TOF) angiography sequence (E: red curved arrow): occlusion of the distal segment of right A2.

DISCUSSION

The corpus callosum is the most important inter-hemispheric commissure of the central nervous system. Technical imaging, in particular magnetic resonance imaging (MRI), allows a diagnostic approach and follow-up of the pathology of the corpus callosum which is dominated by damage, demyelinating, and vascular. Other causes of corpus callosum involvement may be metabolic, traumatic, tumoral, toxic, and micellar causes.

Acute infarction of the corpus callosum is often manifested by two very distinct clinical pictures: on the one hand, a syndrome of classic dysconnection of the corpus callosum made of ideomotor apraxia of the left hand and constructive apraxia, signs related to the interruption inter-hemispherical beams. And on the other hand, a gait disorder of the frontal type (small steps, U-turn on a pivot, abduction of the arms, etc.).

Involvement of the anterior part of the corpus callosum is often associated with infarction of the columns of the fornix, manifested clinically by anterograde amnesia, a consequence of the interruption of the hippocampo-mammillo-thalamo-cortical circuit. Posterior to the corpus callosum is a cause of foreign hand syndrome. This syndrome corresponds to the occurrence, outside of visual control, of involuntary movements of the non-dominant upper limb. This member is perceived as foreign and an intermanual conflict may result [2].

Computed tomography (CT) misses 76% of the positive cases on the MRI carried out 24 hours from the onset of symptoms. Magnetic resonance imaging, in particular flair, diffusion, perfusion, and spectroscopy sequences allow the diagnosis by showing hypersignal flair and diffusion of the corpus callosum (CC) with collapse of blood flow and volume at this level and a significant lactate peak in spectroscopy [3].

Differential diagnosis focuses on neoplastic lesions with a clear predominance of glioblastomas (GBM) and lymphomas. Primary lymphoma and glioblastoma multiforme have a particular tropism for the periventricular white matter and the corpus callosum. These lesions take on the contrast and readily include areas of necrosis (essentially in the event of underlying immunosuppression for the lymphoma). In MRI spectroscopy, these lesions include an elevation of the choline peak and often a peak of lactates and lipids [4]. On perfusion imaging, glioblastoma usually shows increased blood flow. In addition, these richly cellular lesions are often hyperintense on diffusion imaging with a decrease in the apparent diffusion coefficient.

CONCLUSION

The involvement of the corpus callosum can stem from various causes and presents challenges in clinical diagnosis due to its variable nature. It is rarely isolated, often associated with other cerebromedullary lesions. Brain MRI, possibly supplemented by spinal MRI, constitutes the reference examination for the exploration of the corpus callosum and for the study of the different pathologies that may affect it.

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Author Contributions

Sara Habib Chorfa – Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Soumia El Graini – Acquisition of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Kenza Sidki – Acquisition of data, Analysis of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Firdaous Touarssa – Acquisition of data, Analysis of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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Authors declare no conflict of interest.

Data Availability
All relevant data are within the paper and its Supporting Information files.

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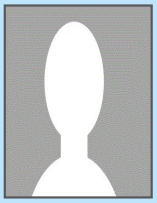

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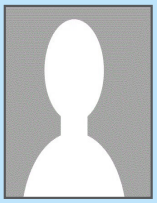

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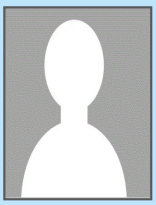

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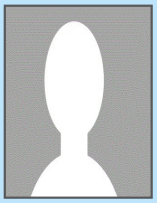

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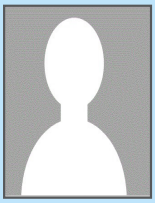

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