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Authors

Carmona, Ruben
Tuan, August
Hughes, Tudor H
[et al.](#)

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Cerebral fat embolism syndrome following revision of right total hip arthroplasty

Ruben Carmona, August Tuan, Tudor H Hughes, Stephen M Dorros

Department of Radiology,
University of California San
Diego, San Diego, California,
USA

Correspondence to
Professor Stephen M Dorros,
sdorros@ucsd.edu

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DESCRIPTION

A 74-year-old man underwent an uncomplicated right total hip arthroplasty revision. Postoperatively, the patient had no focal neurological deficits. Twelve hours later, his mental status declined and he was subsequently intubated. He had roving eyes, decerebrate posturing and minor grimacing to noxious stimuli. He never developed a petechial rash. EEG was unremarkable for seizure activity, transoesophageal echocardiography was negative for cardioembolic sources or interatrial septal defects, and neck CT angiography demonstrated no vascular abnormalities. Head CT was unremarkable and diffusion-weighted images (DWI) of the brain showed multiple foci of restricted diffusion, compatible with acute/subacute infarcts (figure 1A–C). The initial T2*-weighted gradient echo MRI (GRE) was normal (figure 1D); however, 3 days later the same sequence showed areas of susceptibility, compatible with diffuse microhaemorrhages (figure 1E). The patient's clinical course and imaging findings were consistent with cerebral fat embolism (CFE) and the diagnosis was made. CFE occurs in 0.5–3.5% of long bone fractures. Fortunately, some patients recover completely with

supportive care.¹ Hyperintensities on DWI reflect areas of cytotoxic oedema from microinfarcts. DWI findings have been reported in patients following emergency surgery due to hip fracture² and in the absence of intracardiac shunts,³ but rarely after

Learning points

- ▶ Cerebral fat embolism is demonstrated by the classic 'starfield' pattern on diffusion-weighted imaging. The differential diagnosis includes acute embolic infarction, vasculitis and posterior reversible encephalopathy syndrome.
- ▶ T2*-weighted gradient echo MRI is also a sensitive method to detect cerebral fat emboli, which are demonstrated by areas of susceptibility that are compatible with microhaemorrhages.
- ▶ Cerebral fat embolism syndrome, while known to occur in patients with acute traumatic long bone fractures, may also occur following elective orthopaedic surgeries.

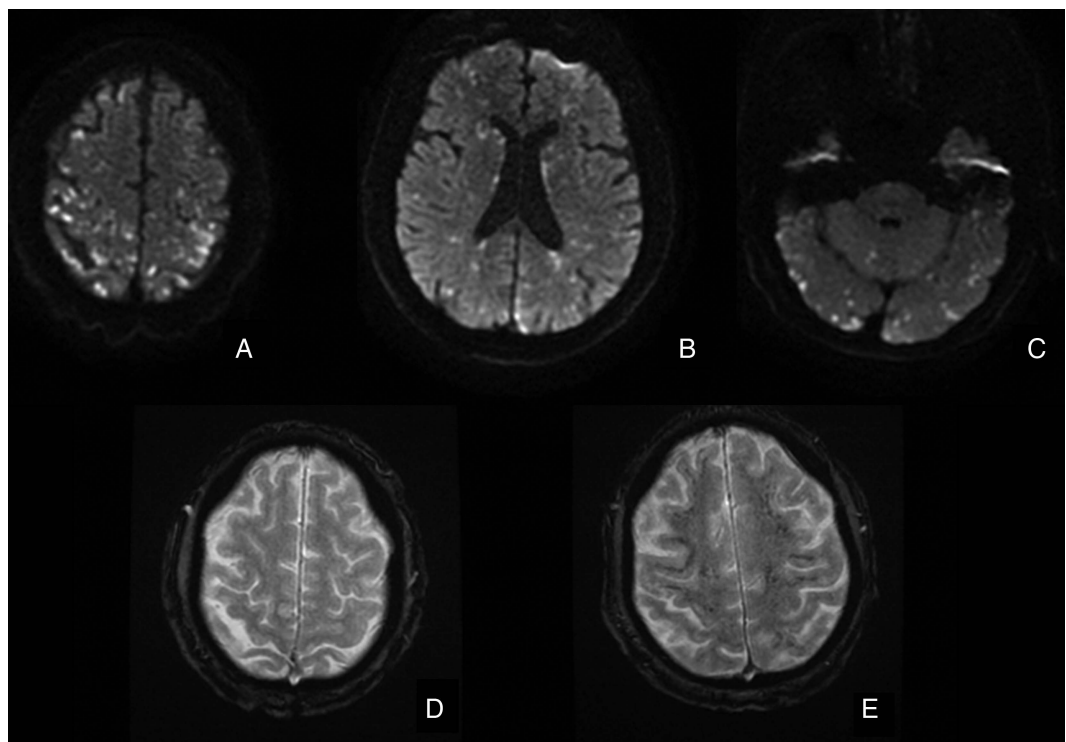


Figure 1 MRI of the cerebral fat embolism. Diffusion-weighted MRI performed on postoperative day (POD) 1 show multiple bilateral and symmetric foci of restricted diffusion throughout the cerebrum and cerebellum, compatible with acute/subacute infarcts (A–C). T2*-weighted gradient echo MRI on POD1 is normal (D). A repeat T2*-weighted gradient echo MRI performed on POD3 shows a new foci of susceptibility in the bilateral subcortical white matter, compatible with diffuse microhaemorrhages (E).



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elective hip revision. GRE findings have only been identified several weeks after surgery.¹ We present images in the acute post-operative period. There are two theories regarding the aetiology of CFE: one involves an embolic passage via pulmonary capillaries, and the other hypothesises inflammatory processes due to free fatty acid formation.³

Contributors RC and AT collected the clinical history, acquired the images and prepared the manuscript. THH and SMD conceptualised the work, interpreted the images and finalised the manuscript.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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