

Images of the month 1: Ischaemic stroke due to pulmonary arteriovenous fistula

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ABSTRACT

A 38-year-old man was admitted to the hospital due to a ‘suddenly developed right hemiplegia, unconsciousness and gaze to the right’. Pulmonary arteriovenous fistulas (PAVFs) are rare but an important cause of stroke in young people, which is easy to be clinically neglected. Therefore, for young patients with pulmonary diseases and cerebral infarction, the possibility of PAVF should be considered.

KEYWORDS: ischaemic stroke, pulmonary arteriovenous fistula, right-to-left shunt

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Case presentation

A 38-year-old man was admitted to the hospital due to a ‘suddenly developed right hemiplegia, unconsciousness and gaze to the right’. The patient had a 19-year history of recurrent pulmonary embolism. A neurological examination showed delirium and the right limb was plegic (grade 0). No obvious abnormality was found in the rest of the nervous system. Computed tomography (CT) of the head showed a high density of the left middle cerebral artery and swelling of left cerebral hemisphere (Fig 1a). Pulmonary angiography demonstrated a pulmonary arteriovenous fistula (PAVF) in the left bronchial artery (Fig 1b). Digital subtraction angiography (DSA) showed occlusion of the left internal carotid artery (Fig 1c). Laboratory examinations revealed abnormal coagulation, such as D-dimer of 20 µg/mL, activated partial thrombin time of 34.0 seconds and prothrombin time of 14.7 seconds. He was not tested for the thrombophilia gene. During the period of hospitalisation, the patient received comprehensive treatment, including vascular intervention therapy, reduce cranial pressure, lowering blood lipid, nerve rehabilitation and so on. Sadly, despite treatments, the patient died as a result of cerebral herniation.

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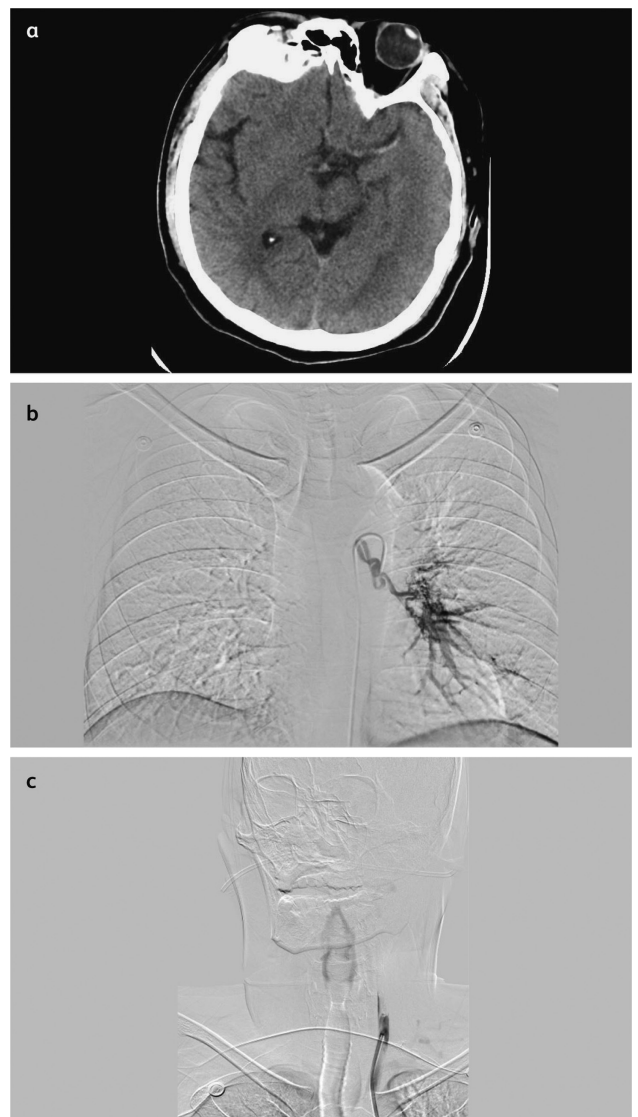


Fig 1. a) Computed tomography of the head showing high density of left middle cerebral artery and swelling of left cerebral hemisphere. b) Pulmonary angiography demonstrating a pulmonary arteriovenous fistula in the left bronchial artery. c) Digital subtraction angiography revealing occlusion of the left internal carotid artery.

Discussion

Right-to-left shunt (RLS) is considered to be the main cause of death in young and middle-aged patients with ischaemic stroke. RLS can be divided into intracardiac and extracardiac types. The former includes patent foramen ovale, atrial septal defect and ventricular septal defect, the latter includes PAVF, patent ductus arteriosus and so on. Among them, ischaemic stroke due to PAVF is rare, so there is a lack of clinical awareness and vigilance.¹ PAVF, a vessel malformation connecting the pulmonary circulation to the systemic circulation while bypassing the pulmonary capillaries, can cause paradoxical cerebral infarction.²

Pulmonary artery digital angiography is the gold standard for diagnosing PAVF, which can provide information such as the size and number of lesion sites. Multi-detector row CT enhancement can not only reveal the lesion itself and corresponding blood vessels but also detect smaller lesions, and can be used to interpret peripheral and complex PAVF more accurately.⁴ In this case, the patient had abnormal coagulation and pulmonary angiography showed PAVF in the left bronchial artery. Therefore, the patient had cerebral infarction due to an RLS formed by PAVF.

A study has shown that patients with ischaemic stroke due to PAVF are 15 years younger than patients with routine stroke. Patients who died were 13 years younger than those who died after routine stroke, overall losing 9 extra healthy life-years per patient.³

PAVFs are rare but an important cause of stroke in young people, which is easy to be clinically neglected. Therefore, for young

patients with pulmonary diseases and cerebral infarction, the possibility of PAVF should be considered. ■

References

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