Persistent headache: a case of post-traumatic cerebral venous thrombosis

Introduction

Post-traumatic cerebral venous thrombosis is a rare and often misunderstood complication. Only a few reports have described an association between cerebral venous thrombosis (as a complication of a head injury) and an intraparenchymal haemorrhage.

This article presents a case of a 32-year-old man with persistent headache after a head trauma. Computed tomography without contrast showed haemorrhage in the right cerebral lobe and no fracture lines. Computed tomography angiography showed cerebral venous thrombosis. Despite the intraparenchymal haemorrhage, anticoagulant therapy was started and the patient's clinical condition progressively improved.

Discussion

Dural sinus or cerebral venous thrombosis is rare and causes 0.5–1% of all strokes (Weimar, 2014). Clinical presentation is variable and often subacute. As shown in this case report, the prevalent symptom is headache which affects almost 90% of patients with cerebral venous thrombosis (Cumurciuc et al, 2005).

There are numerous predisposing factors for cerebral venous thrombosis including pregnancy, use of oral contraceptives, coagulation disorders, tumours, head trauma and neurosurgical operations (Dmytriw et al, 2018). However, cerebral venous thrombosis as a complication of a head injury is a rare clinical entity that is often underdiagnosed. The most frequent site of post-traumatic cerebral venous thrombosis is the superior sagittal sinus and in most cases the pathology

Figure 1. Computed tomography with contrast showed a suspected right cerebellar haemorrhage and hyperdensity of the sigmoid sinus.

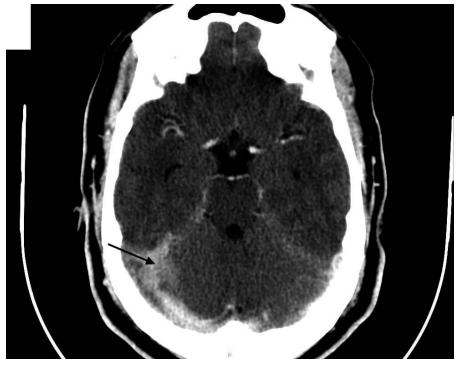
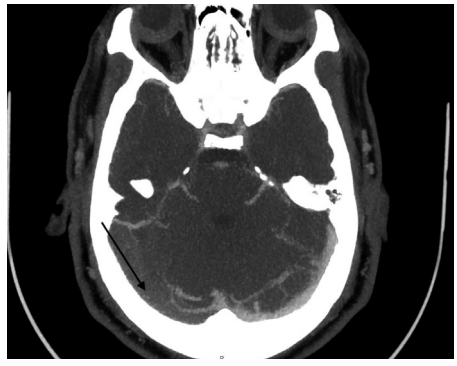


Figure 2. Computed tomography angiography showed thrombosis of right transverse sinus.



Dr Mattia Brunori, 4th Year Resident, Division of Internal Medicine, Department of Medical and Surgical Sciences, S. Orsola- Malpighi University Hospital, Bologna, Italy

Dr Ilaria Lazzari, 4th Year Resident, Division of Internal Medicine, Department of Medical and Surgical Sciences, S. Orsola- Malpighi University Hospital, Bologna, Italy

Dr Guerino Recinella, 4th Year Resident, Division of Internal Medicine, Department of Medical and Surgical Sciences, S. Orsola- Malpighi University Hospital, 40138, Bologna, Italy

Dr Giovanni Puddu, Specialty Doctor, Division of Internal Medicine, Department of Medical and Surgical Sciences, S. Orsola- Malpighi University Hospital, Bologna, Italy

Professor Marco Zoli, Professor of Internal Medicine, Division of Internal Medicine, Department of Medical and Surgical Sciences, S. Orsola- Malpighi University Hospital, Bologna, Italy

Correspondence to: Dr G Recinella (gueri.reci@gmail.com)

CASE REPORT

A 32-year-old man with no significant anamnestic diseases and not receiving any chronic drug therapy reported a non-concussive head injury as a result of an accident at work (he was hit on the head by a wooden platform, which had fallen from a height of 4 m). A week later he presented to the emergency department with persistent headache and pain in the cervical spine. Radiographs of the cervical spine and computed tomography of the brain without contrast showed no vertebral fractures and no parenchymal encephalic lesions. The patient was discharged with symptomatic therapy and recommended to wear a cervical collar.

A few days later, he re-presented to the emergency department with recurrence of intense pulsing headache in the right temporoparietal area associated with tinnitus. Repeat brain computed tomography showed a suspected right cerebellar haemorrhage and no fracture lines (*Figure 1*).

Computed tomography angiography showed a lack of opacification of the right transverse and sigmoid sinuses and of the proximal part of the ipsilateral jugular vein as a result of thrombosis (*Figure 2*). These examinations confirmed the presence of a small (1 cm) roundish haemorrhagic area on the cerebellar tissue adjacent to the sinus.

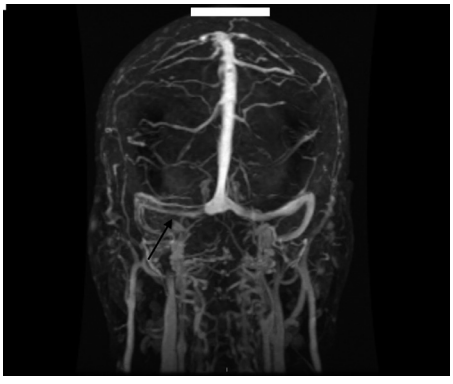
After excluding neurosurgical indications, the patient was transferred to the authors' stroke unit. As anticoagulant therapy was indicated he was started first on low molecular weight heparin and after 3 days was given warfarin.

During the hospital stay the patient's clinical condition progressively improved until the headache symptoms had completely resolved. His vital parameters were always stable.

Cerebral magnetic resonance imaging with contrast was performed 10 days after the start of the treatment which showed stability of the radiological findings.

The patient was discharged. After 3 months, magnetic resonance angiography was performed to guide the possible suspension of anticoagulant therapy, which showed partial recanalization of the cerebral venous system (*Figure 3*). The patient is continuing on anticoagulant therapy.

Figure 3. Magnetic resonance showed a partial recanalization of sigmoid sinuses, right transverse sinus and of the proximal part of the ipsilateral jugular vein.



is associated with the presence of fractures of the cranial theca or haemorrhages adjacent to the walls of the venous sinuses (Fujii et al, 2009).

The normal diagnostic procedure for cerebral venous thrombosis involves computed tomography or magnetic resonance imaging with contrast. However, as seen in this case, a negative computed tomography or magnetic resonance imaging without contrast does not exclude the presence of cerebral venous thrombosis (Linn and Brückmann, 2010).

Contrast investigations are the first choice to diagnose cerebral venous thrombosis. Computed tomography and magnetic resonance imaging with contrast (depending on the experience of the radiologist) can highlight the 'empty delta sign', present in a third of cases, which corresponds to the lack of physiological emptying of the sagittal sinus. This is characterized by a central hypodensity caused by the lack or absence of flow inside the sinus, surrounded by a triangle-shaped contrast impregnation at the back. This radiological sign may appear a few days after the thrombotic phenomenon (Bianchi et al, 1998; Wasay and Azeemuddin, 2005).

In cerebral venous thrombosis the few randomized trials conducted support anticoagulant therapy with intravenous or subcutaneous heparin and warfarin (de Bruijn and Stam, 1999). Direct oral anticoagulants are not yet indicated because there is insufficient evidence and clinical experience. Both the American and the European guidelines suggest that cerebral venous thrombosis should be treated with anticoagulants even in the case of intraparenchymal haemorrhage. This can in fact be caused by the same venous hypertension resulting from the thrombotic obstacle (Einhäupl et al, 2010; Saposnik et al, 2011). Obviously anticoagulation must always be preceded by a careful multidisciplinary evaluation of the patient's stability, and of the dimension and the site of the haemorrhagic lesion.

Anticoagulant therapy should be continued for 3–12 months. There are no randomized controlled trials, prospective controlled studies or case-control studies assessing the optimal duration of oral anticoagulation for the prevention of recurrent cerebral venous thrombosis (Ferro et al, 2017). Furthermore there are no data regarding the specific duration of anticoagulant therapy in the patient with post-traumatic cerebral venous thrombosis. In clinical practice, follow-up imaging is required (Baumgartner et al, 2003) although not all clinicians agree with this. Long-term therapy is recommended in patients with thrombophilia or recurrent cerebral venous thrombosis. **BJHM**

LEARNING POINTS

- Cerebral venous thrombosis as a complication of a head injury is a rare clinical entity that is often underdiagnosed.
- Early diagnosis is essential to allow prompt treatment and improve the patient's prognosis.
- Cerebral venous thrombosis should be treated with anticoagulants even in the presence of intraparenchymal haemorrhage.

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