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LETTER TO THE EDITORS

Decompressive hemicraniectomy followed by endovascular thrombosuction in a patient with cerebral venous thrombosis

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Dear Sirs,

Heparin is the primary acute therapy for cerebral venous thrombosis (CVT) [1], but in a subset of patients, endovascular treatment (ET) or decompressive craniotomy (DC) can be considered. ET is often reserved for patients with a severe course of the disease or who deteriorate despite heparin treatment, although data from randomised studies regarding its efficacy are lacking [2]. Small case series suggest that DC can be life-saving in patients with impending transtentorial herniation due to space-occupying lesions [3, 4]. The combined use of ET and DC in a single patient has only been described once [5]. This case report describes a second patient treated with both DC and ET.

A 37-year-old woman was admitted with a generalized tonic-clonic seizure. She had been suffering from a progressive headache and vomiting since 1 week. On examination she was comatose [Glasgow Coma Scale (GCS) E1M5V1]. Her pupils were equal and responsive to light. Plantar reflexes were extensor bilaterally.

CT-scan of the brain (Fig. 1a) revealed a left frontal hemorrhagic infarct surrounded by a zone of hypodensity and early signs of transtentorial herniation. CT-venography (CT-v) showed thrombosis of the left transverse and superior sagittal sinuses (Fig. 1b). The patient was started on low-molecular weight heparin (nadroparin, 5,700 IU twice daily). One hour later she deteriorated (E1M1V1). Because of impending herniation, an emergency left-sided decompressive hemicraniectomy was performed. Despite an uncomplicated procedure her clinical condition only slightly improved after surgery (E1M3Vtube) and she was transferred to a university hospital specialized in CVT. In the following 2 days she barely improved and, therefore, decision for endovascular treatment was made. Thrombolysis was considered too hazardous because of the recent operation, and therefore thrombosuction was performed using an Angiojet catheter. After the procedure, the sinuses were recanalised, but both the superior sagittal and transverse sinus reoccluded the next day. In the following days her consciousness gradually improved (E4M6V3). Initially she was severely disabled with aphasia and a hemiparesis. Three months later, however, she had only a mild aphasia and was independent in all daily activities (modified Ranking Scale 2).

Evidence supporting the efficacy of endovascular thrombolysis or decompressive hemicraniectomy in CVT is limited. No randomised studies on ET were identified by the a authors of a Cochrane review [2]. A systematic analysis of 72 case series concluded that ET appears to be

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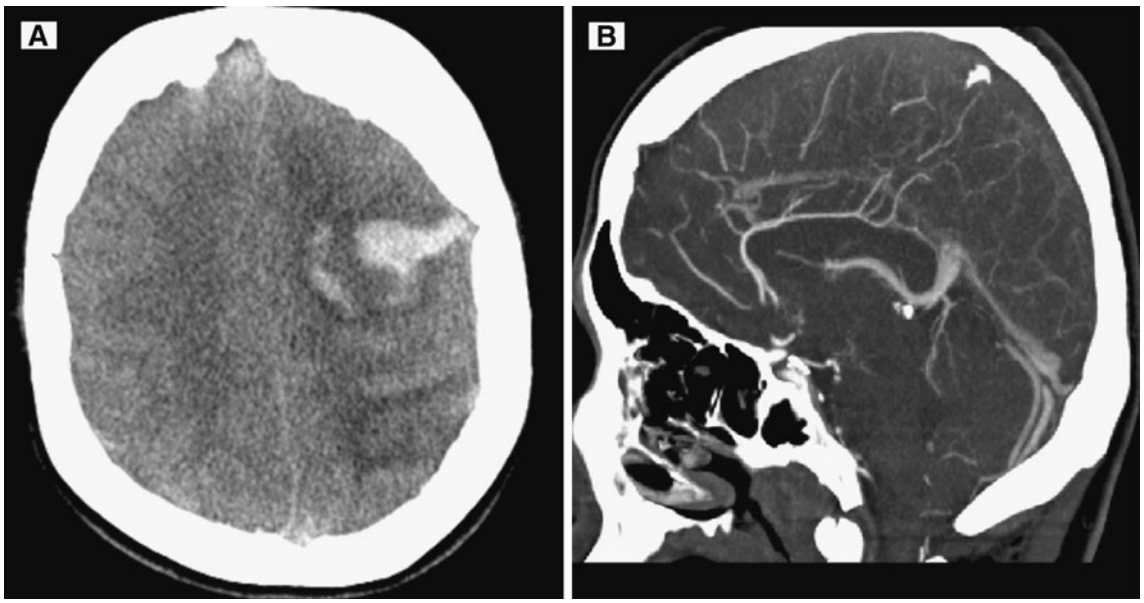

Fig. 1 **a** admission CT-scan showing left hemispheric haemorrhage surrounded by a zone of hypodensity due to venous infarction. **b** CT-venography showing occlusion of the superior sagittal sinus

reasonably safe and can be considered in severe cases that do not respond to heparin therapy [6]. Patients with impending transtentorial herniation, however, do not appear to benefit from endovascular thrombolysis. Probably the effect of endovascular treatment comes too late and cannot prevent further brainstem compression [7]. In such cases, successful results of DC have been reported [3, 4, 8].

The combination of ET and DC has been reported once before in a case report [5]. Despite successful recanalisation of the major sinuses after local thrombolysis, the patient clinically deteriorated. Decompressive hemicraniectomy in that patient eventually resulted in improvement of the patient's condition and at 3 months she had a favourable outcome. In a single center cohort of CVT patients, one patient also underwent both ET and DC, but no specific details on this patient are provided [9].

In our patient, hemicraniectomy was performed first to arrest impending herniation. Since she remained comatose after the procedure, mechanical thrombectomy was performed subsequently. The fact that the patient recovered despite reocclusion of the major sinuses is not easily explained. Possibly, the temporary opening of the sinuses may have restored venous flow sufficiently to prevent further infarction or haemorrhage. It is also possible that the endovascular treatment did not influence the clinical evolution after the hemicraniectomy. In patients treated with heparin only there is, surprisingly, no clear correlation between recanalisation and clinical outcome [10].

In summary, the combination of decompressive hemicraniectomy and endovascular thrombectomy in our patient appeared to be safe and resulted in a good clinical outcome.

Conflict of interest None.

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