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Case report

Spontaneous resolution of acute cranial subdural hematomas

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Abstract

Acute cranial subdural hematoma (SDH) represents a common consequence of traumatic brain injury. The vast majority of acute SDHs larger than 10 mm in thickness require immediate surgical evacuation. In rare occasions, however, spontaneous resolution may occur. In our current communication, we present four cases of spontaneous resolution of acute cranial SDH. Further more, the proposed theories explaining spontaneous resolution of acute SDH, as well as, clinical parameters and imaging characteristics that might predict such phenomenon, are also reviewed. The possibility of spontaneous resolution of an acute SDH, although remote, may impact the decision making process regarding the management of these patients under certain conditions.

Keywords: Acute; Redistribution; Spontaneous resolution; Subdural hematoma; Cranial; MRI

1. Introduction

Acute subdural hematomas (SDH) represent a common consequence of head injuries. Emergent surgical evacuation is recommended in the vast majority of the acute SDH cases and definitely in those greater than 10 mm in thickness [1–4]. Contrariwise, surgical decompression of a thin rim acute SDH of 3 mm or less in diameter is unlikely to improve the patient's condition [4–6]. However, a controversial group of patients regarding their surgical or conservative management are those with an acute SDH of 5–10 mm in thickness with Glasgow Coma Scale score of 9–13 [4]. Moreover, in rare occasions spontaneous resolution of an acute SDH has been reported [7–29]. The time required for spontaneous resolution of the acute SDH in the previously reported cases ranged between a few hours and a few days after injuries [7–19,22–28]. A similar phenomenon of spontaneous resolution has been well described in patients with chronic SDHs [30–32].

In our current communication, we report a series of four adult patients with post-traumatic acute SDH, which were spontaneously resolved. With this opportunity, we review the pertinent literature with emphasis on the pathophysiologic mechanisms implicated in the resolution of acute SDH.

1.1. Case 1

Following a high speed motor vehicle accident, a 29-year-old male was transferred to our institution with GCS score of 8. The patient's laboratory results were within normal limits. A head CT scan, obtained upon admission, showed left fronto-parietal subarachnoid hemorrhage with no evidence of SDH.

An intra-parenchymal intracranial pressure (ICP) monitor was inserted in the left frontal area. The patient was admitted to the neuro-intensive care unit.

Approximately 6 h later another head CT scan was obtained, which demonstrated a 1.8 cm left-sided fronto-temporal SDH with a 2 cm midline shift (Fig. 1). The patient's neurological status, however, was unchanged. His ICP was approximately 40 mmHg while his cerebral perfusion pressure was 60–70 mmHg. In consideration of emergent surgical

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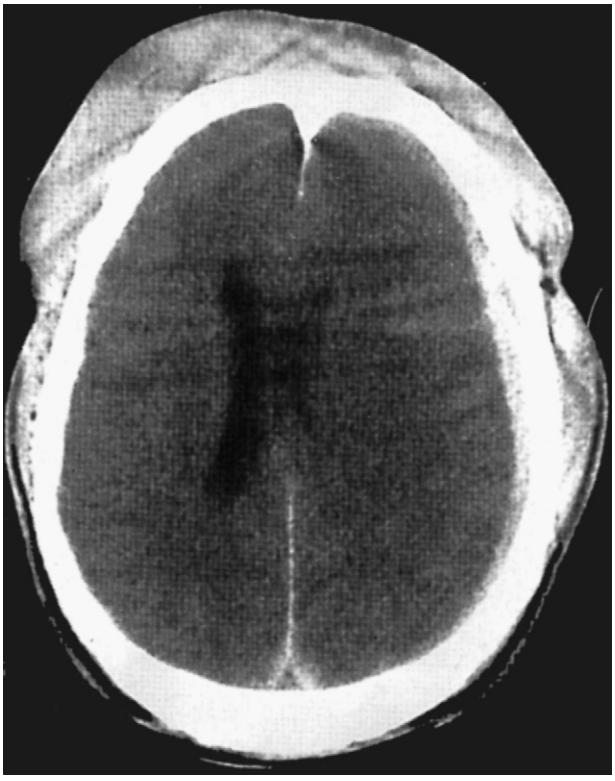

Fig. 1. Head CT scan obtained 6 h after admission, demonstrates a left-sided acute subdural hematoma (1.8 cm in its largest diameter). Note also the effacement of the left lateral ventricle and the midline structure shift.

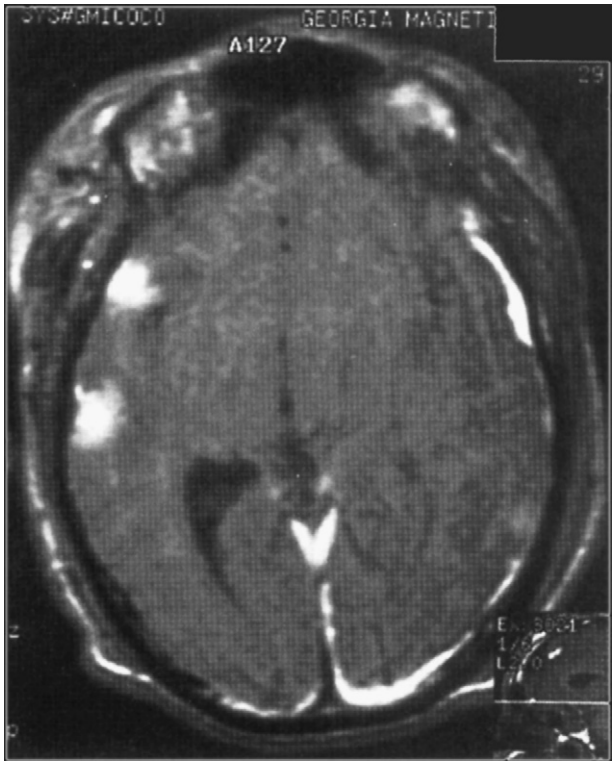

Fig. 3. Brain MRI (axial T_1 WI) demonstrates redistribution of blood in the subdural space formatting a thin layer.

evacuation of the SDH his clotting studies were re-evaluated at that time and were found to be markedly abnormal (INR >2.8). It was elected to monitor the patient closely in an attempt to correct his abnormal clotting studies rather than embarking on immediate surgical intervention. Over the following 12 h, the patient's hematological situation deteriorated and he was noted to display fulminant disseminated intravascular coagulopathy despite all efforts to correct it. To assess the intracranial situation, another head CT scan was obtained approximately 13 h after his initial trauma, which showed the earlier left SDH to be significantly decreased in size (Fig. 2).

A new head CT scan performed 2 days later showed complete resolution of the SDH. He progressively became more alert. Approximately 10 days after his admission, a brain MRI study was done which revealed redistribution of the SDH around the left sylvian fissure, the left side of the tentorium and both hemispheral convexities (Fig. 3). The patient

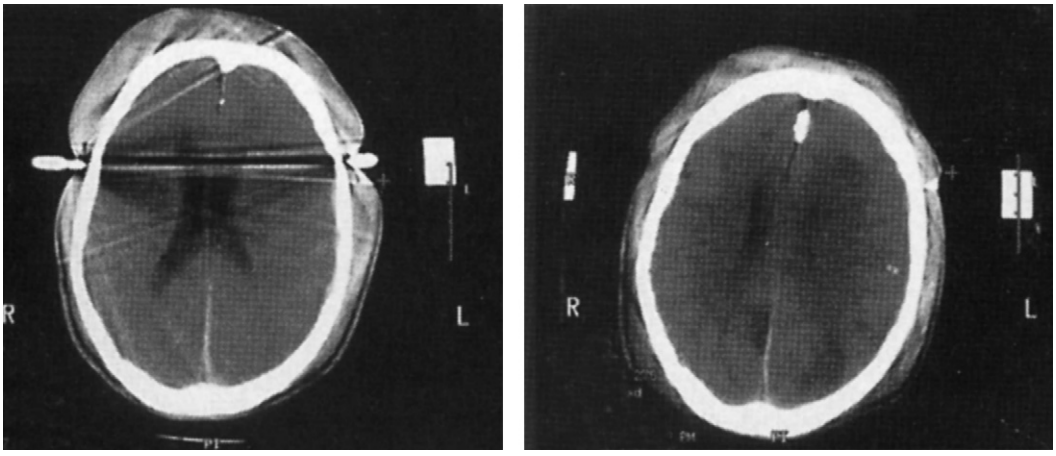

Fig. 2. Head CT scan obtained approximately 6 h later. The previously observed left-sided acute SDH has been significantly decreased in size and the effacement of the ipsilateral ventricle and the midline shift had also been improved.