Frontal traumatic intracerebral hemorrhage

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Unilateral frontal traumatic intracerebral hemorrhage

Bifrontal traumatic intracerebral hemorrhage

Frontal traumatic intracerebral hemorrhage (ICH) is a common result of traumatic brain injury, they are largely clustered in the frontal and temporal lobes.

Older age, anticoagulant use, antiplatelet medication use, and frontal contusion location have been associated with hemorrhagic progression of contusions (HPCs).

Pittella et al. review the literature on cerebral amyloid angiopathy (CAA) -related intracerebral hemorrhage associated with head injury. CAA-related intracerebral hemorrhage after head injury may occur due to a minor trauma, minor and severe falls, or in the setting of a traffic accident. However, even in this last condition, it seems to happen mostly in patients who had a mild to moderate head injury. These facts show that replacement of the contractile components of the arterial tunica media by amyloid renders the affected cerebral blood vessels more vulnerable to head injury associated with acceleration and deceleration, independently of the severity of the dynamic loading acting on the head [1)].

Outcome differences between bilateral and unilateral frontal ICH are not well studied but would be valuable to predict prognosis in clinical practice.

Hung et al. compare the risk of developing delayed ICH after bilateral or unilateral frontal ICH, and second to determine the variables helpful to predicting outcome according to the Glasgow Outcome Scale (GOS). Between January 1993 and December 1997, 694 consecutive patients with traumatic ICH were admitted to the Chang Gung Medical Center within 24 h of the trauma. Patients with ICH in sites other than the frontal lobes were excluded. A total of 161 cases (mean age 46.3+/-20.3 years), including 57 bilateral (mean age 52.5+/-18.7 years) and 104 unilateral (mean age 42.9+/-20.5 years)

traumatic frontal ICH were studied.

Twenty-eight of 57 patients (49%) with bifrontal ICH versus 17 of 104 patients (16%) with unilateral frontal ICH had a further, delayed ICH. In 42 of 45 patients (93%) with delayed ICH, this occurred within 5 days of the initial trauma. Multivariate logistic regression was used to select significant predictors of outcome. They found that delayed ICH ($p<0.001$), age ($p=0.004$) and mechanism of injury ($p=0.001$) explained the worse outcome in patients with bifrontal ICH. The best-fitting logistic regression model included three variables: delayed ICH ($p=0.011$), initial GCS ($p=0.023$), and a sum score of clinical and radiological variables ($p=0.003$). Bifrontal ICH tended to occur in older patients after a fall and was associated with a higher risk of developing delayed ICH or brain stem compression compared to unilateral ICH damage. Using these three variables - delayed ICH, initial GCS, and the sum score - in a logistical regression model is useful to predict outcome in patients with traumatic frontal ICH and may aid patient management [2)].

Case reports

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77 years old who comes to the emergency room for disorientation, loss of control of sphincters and agitation after a casual crash without loss of consciousness the previous day on the occipital region. Cognitive and neurological alterations since then. Intense headache that does not improve with medication and disorientation along with nocturnal agitation.

Patient conscious, alert, oriented in space and person, disoriented in time, coherent and comprehensible language, without signs of aphasia, obey orders, GCS: 14.

CT

Acute right frontal traumatic intracerebral hemorrhage of approximately 46 x 37 x 50 mm (AP x TR x CC) accompanied by moderate perilesional brain edema.

This hematoma is associated with mass effect, causing a midline shift of about 5 mm to the left and partial collapse of the frontal horn of the right ventricle. It is accompanied by subarachnoid hemorrhage in right frontoparietal grooves, small left frontal extraaxial hematic and hyperdense lamina in the cerebral sickle by subdural component.

Frontal cerebral contusions are often the result of sufficient inertial loading and acceleration combined with a sudden stop (i.e., head impact or abrupt change in the direction of the head's movement, which is often referred to as deceleration). This series of events may cause the brain to come into abrupt contact with one or more internal surfaces of the skull. Because the posterior areas within the skull are relatively smooth, primary contusion injuries in the posterior portions of the brain are rare in the absence of direct trauma to the occiput or posterior skull regions. More frequently, however, the anterior and inferior portions of the brain (the frontal poles, orbitofrontal cortex, and anterior temporal lobes) become contused against the bony prominences of the skull (e.g., sphenoid wing and temporal fossa). The expansion (or blossoming) of the contusion may result in extensive frontal edema and hemorrhage either early after injury or even days later and may require neurosurgical intervention.

Functionally, the frontal cortex is known to be involved in numerous cognitive activities, among them, executive control and memory. The construct of executive control encompasses numerous functions, but it is generally defined as the capacity to organize, plan, execute, and change cognitive functions. Executive control is a critical aspect of cognition that is commonly impaired after traumatic brain injury.

In fact, although individuals and clinicians often report or emphasize memory as being a primary

functional concern, executive control dysfunction might be the most disabling aspect of cognitive compromise after brain injury.

The prefrontal cortex is of great importance in the processing of episodic memory. Finally, injury to the frontal cortex may lead to disturbances of mood and behavior.

see Bifrontal cerebral contusion.

Case series

A total of 446 patients with frontal contusions in a high-altitude region were retrospectively reviewed.

Wei et al., combined the patients' head computed tomography (CT) and clinical features for grading. The score determined the treatment and whether or not the bone flap was removed. If the patient's condition deteriorated, and the score was above 1, the patient was surgically treated. At the same time, the risk factors of deterioration were analyzed. Finally, the Glasgow Outcome Scale (GOS) of conservative treatment and surgical treatment groups was analyzed.

Among the 446 patients, 254 were conservatively treated, and 28 worsened and underwent surgical treatment. In total,122 patients received an operation. Logistic regression analysis indicated that scattered hematoma, anterior angle of the ventricle, and hemoglobin concentration were risk factors. The postoperative GOS of conservative treatment and surgical treatment groups was analyzed; the good healing rate of the conservative treatment group was 91.12%, the good healing rate of the retain-bone flap surgical group was 75%, and the good healing rate of the remove-bone flap surgical group was 63.33%.The failure rates of groups were 9.38% and 7.87%, respectively.

The grading system could guide frontal contusion treatment, which could help patients to achieve a good healing rate and reduce the failure rate [3].

1)
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2)
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3)
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