

Reversal of Symptomatic Cerebral Vasospasm after Aneurysmal Subarachnoid Hemorrhage by Continuous

Lumbar Drainage: Evidence on Study of Perfusion Computed Tomography

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Introduction

Symptomatic cerebral

vasospasm, also called delayed neurological deficit (DIND) is one of the devastating complications after aneurysmal subarachnoid hemorrhage (SAH). Studies have shown lumbar drainage (LD) is a safe and effective way to clear the subarachnoid hemorrhage and reduce the incidence of vasospasm1. However, whether lumbar drainage could be a therapeutic modality in DIND is unknown. Our aim is to compare the change of cerebral perfusion of the patients suffering from DIND before and after lumbar drainage by using perfusion computed tomography.

Methods

During a 1.5-year period, between 2010 January and 2011 July 54 patients with aneurysmal SAH were treated at our center. All patients had perfusion computed tomography (CTP) and CT angiography (CTA) at diagnosis, on the day DIND developed and then three days after LD. Changes of cerebral blood flow (CBF) and mean transit time (MTT) was analyzed and correlated with outcome.

Results

During a 1.5-year period, there were 54 patients with aSAH treated at our hospital. Forty one (76%) sustained Fisher grade III or IV SAH, and 18 (44%) of them developed delayed ischemic neurological deficit (DIND). Ten patients (55.5%) failed triple H therapy, and three of them were excluded.

All patients suffered from perfusion impairment. There were six patients developed angiographic vasospasm. One patient did no have evidence of vascular constriction also suffered from perfusion deficit, which implied the large vascular constriction is not the culprit of perfusion impairment. After lumbar drainage, the degree of angiographic vasospasm was relieved partially in five patients. The degree of vasospasm remained unchanged in one patient. Nonetheless, all patients experienced perfusion improvement.

The change of MTT reaches statistical significance (2.365e-10). The mean shortening of MTT is 0.967 seconds, and the 95 percent confidence interval is (0.717; 1.218). The change of CBF reaches statistical significance, too (6.522e-16). The mean improvement of CBF is 8.109 ml/100g/min, and the 95 percent confidence interval is (6.667; 9.551). (Paired t-test)













Conclusions The pathophysiology of DIND is complex and vascular constriction could only plays a partial role. Lumbar drainage could improve the perfusion of the patients suffer from DIND and may also reverse vasospasm. It could also benefit the patients without angiographic vasospasm.



No.6, 73M, Fisher III, WFNS

IV, BA-SCA an.

References

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