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Minimally invasive surgery for evacuating the intracerebral hematoma in early stages decreased secondary damages to the internal capsule in dog model of ICH-Observed by diffusion tensor imaging

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Diffusion tensor imaging was used to observe the effects of performing early minimally invasive surgery (MIS) on internal capsule in dog model of intracerebral hemorrhage (ICH). Twenty-five male dogs were selected to prepare an ICH model, and then they were randomly distributed into a model control group (MC group, 5 dogs) or a minimally invasive surgery group (MIS group, 20 dogs). In the MIS group, the intracerebral hematoma was evacuated by stereotactic minimally invasive procedures over 6 hours (5 dogs), 12 hours (5 dogs), 18 hours (5 dogs), or 24 hours (5 dogs) following successful induction of intracerebral hemorrhage. All the animals were sacrificed within two weeks after the hematoma was surgically evacuated. The neurological deficit score and diffusion tensor imaging (DTI) were observed before and after the MIS. The perihematomal blood-brain-barrier (BBB) permeability and the brain water content (BWC) were measured two weeks after the hematoma was surgically evacuated. The DTI demonstrated that integrity of the internal capsule restored largely after surgery and the fractional anisotropy (FA) values of the internal capsule on the hematoma side increased significantly as compared with those in the MC group or those before surgery in the same group. The postoperative ratios of FA values of each MIS subgroup increased compared with the MC group and those before surgery in the same subgroup preoperative. The neurological deficit score, the perihematomal BBB permeability and the BWC of each MIS subgroup decreased significantly compared to the MC group. The 6-12 hour group displayed a more favorable result.

Biography

Guofeng Wu has completed his PhD in 2010 from Fudan University. He is the Director of the Emergency Department of the Affiliated Hospital, Guizhou Medical University, the Vice-chairman of the Guizhou Stroke Association. He has published more than 20 papers in related journals.

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