

Mouse subarachnoid hemorrhage (SAH) models are becoming increasingly important. We aimed to report and discuss the detailed technical-surgical approach and difficulties associated with the circle of Willis perforation (cWp) model, with reference to the existing literature.

Methods: First, the cWp model was reproduced using ddY mice following scarification at 0 h, Days 1, 2, and 3 after SAH. Second, C57BL/6 mice were subjected to SAH with histological examination on Days 1, 2, and 3. Sham-operated mice were sacrificed on Day 2. Neurological performance, amount of subarachnoid blood, cerebral vasospasm (CVS), and neuronal injury were assessed. Relevant articles found in the MEDLINE database were reviewed.

Results: Induction of SAH was successfully reproduced. The volume of subarachnoid blood decreased with time due to resorption. Neurological performance was worse in SAH compared with sham. Signs of CVS could be confirmed on Days 2 and 3, but not Day 1. The cumulative number of microthrombi was significantly higher on Days 2 and 3, but not Day 1. Apoptotic and degenerative neurons were found in the cortex and hippocampal area. Our review of the literature revealed the cWp model to be the most frequently used. The present findings largely confirmed previously published results. However, detailed technical-surgical description and its discussion were sparse, which we provide here.

Conclusions: The current study provides additional useful information characterizing the cWp model. This model may be of first choice at present, as important pathologies can be reproduced and most findings in the literature are based on it ¹⁾.

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Muroi C, Fujioka M, Okuchi K, Fandino J, Keller E, Sakamoto Y, Mishima K, Iwasaki K, Fujiwara M. Filament perforation model for mouse subarachnoid hemorrhage: surgical-technical considerations. *Br J Neurosurg*. 2014 Dec;28(6):722-32. doi: 10.3109/02688697.2014.918579. Epub 2014 May 19. PMID: 24842082.

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