

Video Article

Focal cerebral ischemia model in rat

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Abstract

1. Wistar albino rats from house colony of SPF vivarium of SIU-University of Antioquia, Medellin- Colombia, are kept in a 12:12 h dark:light cycle and received food and water ad libitum. Animals are handled following the Colombian normative (Law 84 of 1989 and resolution 8430 of 1993) and the European Union (86/609/EEC) guidelines. Special care is taken to minimize animal suffering and to reduce the number of animals used. Middle cerebral artery occlusion (MCAO) and reperfusion, was adopted from previous studies 1,2,8 with slight modifications. 2. Before to the surgery procedure, nylon monofilaments 4/0 must be rounded in the tip using a flame, so that the head to be 1 / 3 larger than the cylindrical body of nylon and folded with a notch at 17 mm of length. To increase adhesion to the endothelial surface for preventing early reperfusion, the nylon is placed in poly-L lysine (0.1% [wt/vol], in deionized water) and dried in oven at 37 C. 3. Rats are anesthetized with a mixture of ketamine (60 mg/kg) and xylazine (5 mg/kg) intraperitoneally injected plus a subcutaneous atropine administration (100 µg/kg). The animals are placed in supine position and the ventral cervical region is shaved and disinfected. The extremities are fixed and the animals maintained in surgical plane by inhalatory anesthesia (2% Isoflurane in 96% oxygen). 4. A cervicotomy of 3,0 cm. is realized. The skin, subcutaneous tissue and muscle fascia are incised to visualize the submandibular salivary glands and lymphoid nodules. The sternomastoid muscles right is retracted laterally under which one observes the omohyoid muscles, which is separated by roma divulsion to visualize the right common carotid artery (CCA) and the vagus nerve. 5. To isolate the CCA (common carotid artery) passing a latex strap around it, as well as isolating the branches of the external carotid artery (ECA) and the internal carotid artery (ICA). To observe the ascending pharyngeal artery, superior thyroid and occipital artery branches of the ECA, which are electrocoagulated with a bipolar electrocautery. After, the pterygopalatin artery, the first branch of the ICA is isolate and electrocouagulated optionally. 6. The distal portion the ECA is ligated with nylon 6/0 and cut. The CCA and ICA are temporary clamping with micro clamp on latex bands. The filament is introduced from the right ECA through a small puncture and advanced into the right ICA. A loose 8/0 suture is tied around the proximal right ECA (stump) to prevent bleeding and dislodgment. 7. The clamp from the ICA is removed and the monofilament is gently advanced until the notch. The length of progression varies between 17-19 mm, which corresponds to the distance from the ECA to the origin of the middle cerebral artery (MCA). The intraluminal filament blocks the blood flow in the specific territory of the MCA. 8. Finally, the clamp on the CCA is removed. The incision is closed leaving protrude at least 1.0 cm of the monofilament. After, 60 minutes gently retracts the most of the monofilament length allowing the reperfusion, but do not completely remove it. Subcutaneous Meperidine analgesia is administered at 25 - 50 mg / kg, and post-operative observation must be done. Neurological score is performed to the 6 hours after anesthesia effects.

Disclosures

No conflicts of interest declared.