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Olfactory bulbectomy

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We use this protocol and it's working

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Abstract

Bilateral olfactory bulbectomy (OBX) involves the surgical removal of both olfactory bulbs. It is a classic animal model for studying major depression. Below we describe the protocol for performing an OBX in rats.

Guidelines

Rats should be randomly assigned to one of two surgical groups, sham or OBX injury, and receive post-surgical care. Do everything possible to reduce animal suffering. Before or during the experiment, animals showing signs of suffering must be examined immediately by a veterinarian and, if necessary, euthanized.

Materials

Ketamine
Xylazine
Sterile saline
Benzalkonium chloride
Iodopovidone
Microdrill
Cannula connected to a distilled water pump
Hemostatic sponge
Hartmann's solution
Surgical instruments
Syringes
Cotton balls and gauze

Before start

Verify availability of equipment, anesthesia, and necessary supplies.

1 Anesthetize the rats via intraperitoneal injection of a ketamine/xylazine cocktail (0.75 ml ketamine + 0.25 ml xylazine + 5 ml sterile saline), at a dose of 0.125 ml per 20 g of body weight.

2 Once anesthetized, shave the head and perform asepsis using benzalkonium chloride and iodopovidone.

3 Make a 1 cm midline incision on the skull from the forehead to the dorsum of the nose. Uncover the aponeurosis and periosteum to reach the bone.

4 Drill two holes (2 mm diameter) with a microdrill, located 8 mm anterior to the bregma and 1 mm from the midline of the frontal bone.

5 Aspirate the olfactory bulbs using a sterile cannula connected to a distilled water pump, taking care not to cause damage to the prefrontal cortex. For the sham group, perform the same surgery except that the olfactory bulbs are not removed.

6 To prevent blood loss, fill the holes with hemostatic sponge (Spongostan, Ethicon, Inc. USA), suture continuously and cover with iodopovidone.

7 Post-surgery, administer 4 ml of Hartmann's solution (PiSA, México) via subcutaneous injection. House the rats in pairs (Sham/OBX) in their respective cages to recover for four weeks.

8 At the end of the recovery period and behavioral testing, verify that the removal of the olfactory bulbs is complete and that there is no damage to the prefrontal cortex.

Protocol references

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