

Ovariectomy (Oophorectomy)

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Method Article

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Abstract

Ovariectomy is an important surgery protocol studying the effects of female hormones on small animal metabolism.

Equipment

- Hood
- Surgery desk
- Surgical operation boards (6) wrapped with absorbent underpads (Rolls, 20'x100'; Catalog No. 14-206-64; Fisher Scientific, Pittsburgh, PA USA)
- High intensity surgery light (Model 11201; Burton Medical Products Corporation, Van Nuys, CA USA)
- Halothane vaporizer (Model 100H; Ohio Medical Products, a Division of Airco, Inc., Madison, WI USA), halothane (prescription is needed; Halocarbon Laboratories, River Edge, NJ USA), and a glass desiccator for halothane anesthesia.
- Oxygen tank (Breathing quality; Generic brand)
- Fan (Generic brand)
- Autoclave/Dryer (Napco Model 9000-D; Precision Scientific, Inc., Chicago, IL USA; represented by Fisher Scientific), autoclavable tapes (Catalog No. 11-848-10; Fisher Scientific), and autoclavable wrapping (24x24 inches; Catalog No. 11-890-2; Fisher Scientific)
- Dry glass bead sterilizer (Steri 350; Inotech Biosystems Int'l, Inc., Rockville, MD USA, 1-800-635-4070)
- Kimwipes paper (Catalog No. 06-666A; Fisher Scientific)
- Fresh D.I. water
- Surgical instruments such as 12 cm blunt/blunt scissors, Adson forceps, and Graefe forceps (Fine Science Tools USA, Inc., Foster City, CA USA, 1-800-521-2109, www.finescience.com)
- Autoclip wound closing system (Catalog No. 01-804 applicator, 01-804-5 nonsterile wound clips, and 01-804-15 remover; Fisher Scientific, Pittsburgh, PA USA)

Procedure

The two ovaries are small, round, irregular-shaped organs found on each side of the abdomen, a little below the kidney. Each ovary is attached to one uterine horn of the bicornuate uterus via a highly convoluted and tightly packed Fallopian tube (oviduct). In old rats the ovary is often totally obscured by fat, but this usually acts as a landmark since this fat is freely moveable. Fat attached to the midline spinal muscles is not freely moveable.

1. Fast the rat for 16 h.
2. Take out the sterilized surgical instruments from the Autoclave and set up the surgery table. Turn on the surgical lights. Turn on the hood. Pour halothane into the vaporizer and glass desiccator. Switch on the pressure regulator on the oxygen tank. Set halothane vaporizer to 2 (2.0% halothane in 2.0 L oxygen/min at 1 ATM, 760 mmHg).
3. Use thick gloves to take the rat out of cage and put it into a container with a lid. Put the rat into a glass desiccator with vaporized halothane inside under the hood. Watch carefully not to over-anesthetize the rat.
4. After the breathing rate of the rat slows down, take out the rat from the desiccator, and lay it on its ventral surface with its tail towards the investigator on the operating board.
5. The mouth and nose of the rat are inserted into the syringe tube attached to the halothane vaporizer. A folded gauze sponge is dipped with D.I. water and placed on the mouth of the rat.
6. Shave the both sides of flanks near the hump of the rat.
7. Wrap the hair with paper towel and throw it away. Clean the abdomen and flank with 2 wet and 1 dry Kimwipers.
8. Sterilize the both sides of flanks with a Betadine dipped gauze sponge. Wash the Betadine away with D.I. water dipped and dry Kimwipers.
9. Prepare a pair of sterile surgical gloves for

the surgeon. 10. Cut the left flank skin layer with Adson forceps (in surgeon's left hand) and 12 cm straight blunt/blunt scissors (in surgeon's right hand) along the abdominal line. Then nick cut the muscle layer with 12 cm straight sharp/sharp scissors to form a small hole. 11. Use Graefe forceps to find the ovaries surrounded by a variable amount of fat. 12. Pull out the ovary through the muscle incision by grasping the periovarian fat. The ovary itself must not be touched otherwise small pieces may become detached and will reimplant and carry on normal function. 13. Use 12 cm blunt/blunt scissors to cut the junction between the Fallopian tube and the uterine horn, together with all accompanying blood vessels and fat. Return the horn into the abdominal cavity. 14. Bleeding is usually slight and inconsequential and soon stops of its own accord. There is rarely any necessity to observe haemostasis or ligate the blood vessels during the operation. 15. Use Autoclip wound closing system to close the incision. 16. Do the same procedure steps from 10 to 15 to the right side. 17. Place the rat back into the cage. Check its health status several hours later, and so as the following several days.

Timing

10-15 minutes per rat

Troubleshooting

Watch carefully not to over-anesthetize the rat. Check its health status several hours later, and so as the following several days.

References

Zou, W., Noh, S.K., Owen, K.O., & Koo, S.I. (2005) Dietary carnitine enhances the lymphatic absorption of fat and a-tocopherol in ovariectomized rats. *J. Nutr.* 135: 753-756.

"<http://jn.nutrition.org/content/135/4/753.full>":<http://jn.nutrition.org/content/135/4/753.full> Waynforth, H.B. & Flecknell, P.A. (1992) *Experimental and surgical technique in the rat* (second ed.), pp. 206-209, 264-273. Academic Press, San Diego, CA.

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