

Dec 15, 2022

Deep hind paw incision model

DOI

<https://dx.doi.org/10.17504/protocols.io.j8nlkw9k5l5r/v1>

Fanglin Lu¹

¹MD, MS



Fanglin Lu

Create & collaborate more with a free account

Edit and publish protocols, collaborate in communities, share insights through comments, and track progress with run records.

Create free account

OPEN  ACCESS



DOI: <https://dx.doi.org/10.17504/protocols.io.j8nlkw9k5l5r/v1>

Protocol Citation: Fanglin Lu 2022. Deep hind paw incision model. **protocols.io**
<https://dx.doi.org/10.17504/protocols.io.j8nlkw9k5l5r/v1>

Manuscript citation:

Lu F, Kato J, Toramaru T, Sugai M, Zhang M, Morisaki H. Objective and Quantitative Evaluation of Spontaneous Pain-Like Behaviors Using Dynamic Weight-Bearing System in Mouse Models of Postsurgical Pain. J Pain Res. 2022 Jun 2;15:1601-1612. doi: 10.2147/JPR.S359220. eCollection 2022.

License: This is an open access protocol distributed under the terms of the **Creative Commons Attribution License**, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited

Protocol status: Working

We use this protocol and it's working

Created: December 10, 2022

Last Modified: December 15, 2022

Protocol Integer ID: 73825

Keywords: rat model of incisional pain, deep hind paw incision model, incisional pain, postoperative pain, data anesthesia, consciousness recovery, rat model, pain

Abstract

The deep hind paw incision model is established to evaluate postoperative pain. Based on TJ Brennan's rat model of incisional pain (1996), several modifications are made. This protocol outlines the procedures from a to data anesthesia to consciousness recovery.

Image Attribution

Department of Anesthesiology, Keio University School of Medicine, Tokyo, Japan

Guidelines

Please follow the Animal Research: Reporting of In Vivo Experiments (ARRIVE) guidelines.

Materials

Disinfection:

- 10% povidone–iodine solution (popiyodon solution 10%; Yoshida Pharmaceutical Co., Ltd., Saitama, Japan)
- Drapes
- Cotton buds

Surgery:

- 5mL syringe for plantar-flexion position
- Scalpal blades for incision
- Double-ended micro spatula
- Iris forceps (curved)
- Dumont forceps (angled 90°)

Suture:

- Micro-Adson forceps
- Needle holders
- 6-0 nylon suture with needle
- Operating scissors
- Baramycin ointment (TOYO Pharmaceutical Co., Ltd., Osaka, Japan; catalog number: 672639)

Anesthesia and disinfection

- 1 The mouse placed in a prone position under sevoflurane anesthesia (4 volume% in 1 L/min oxygen) delivered via a nose cone. Sevoflurane inhalation is used, as it is safe, non-invasive, rapid, and easy to control. Adequate anesthetic depth is ascertained by loss of response to tail clamp. 3m
- 2 Keep the ipsilateral paw in plantar-flexion position. Disinfection with 10% povidone-iodine solution. Place a drape. 1m

Note

Plantar-flexion position: We suggest to place a 5mL syringe underneath the ipsilateral paw. Operation on the plantaris muscle will be much easier.

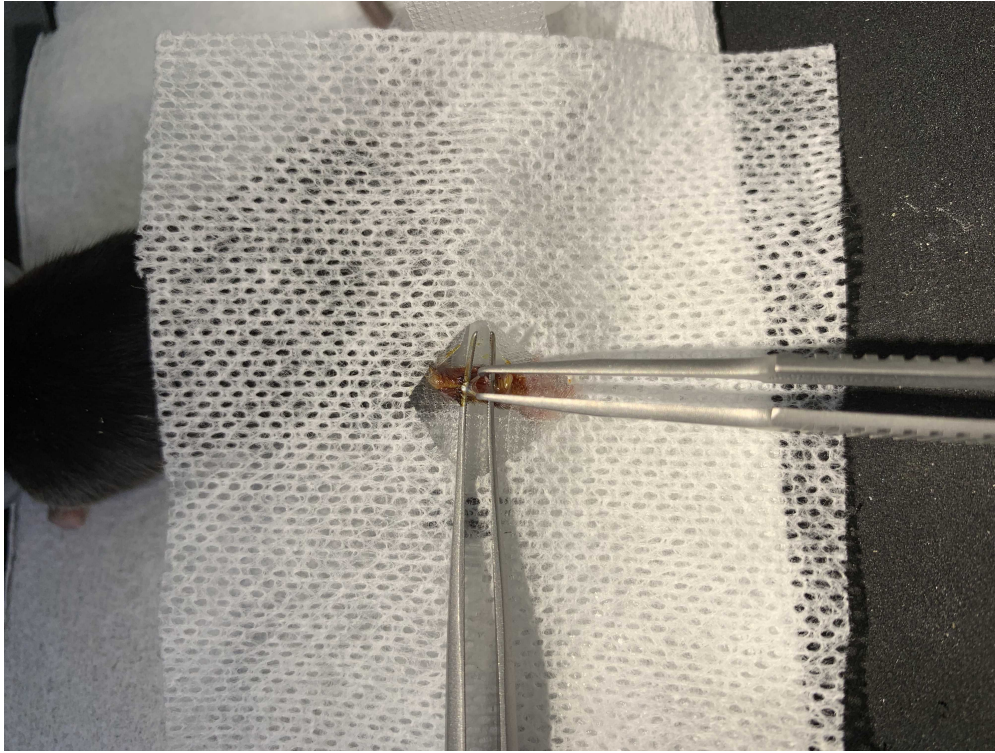
Deep hind paw incision

- 3 Make a 5-mm longitudinal incision through the skin using a scalpel blade, starting 2 mm from the proximal edge of the heel and extending toward the toe. 30s



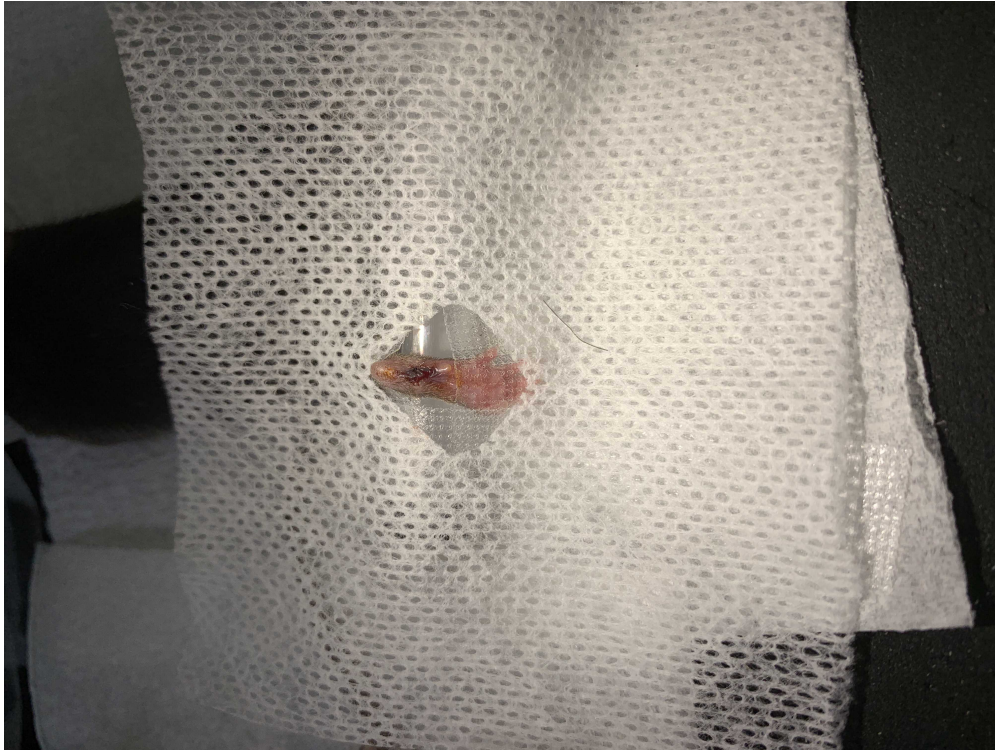
- 4 Elevate the underlying plantaris muscle using curved iris forceps, with the help of a double-ended micro spatula. Incise the fascia and plantaris muscle with angled 90° dumont forceps. Keep the position for 5 min.

5m



- 5 After hemostasis, close the wound using a 6-0 nylon suture and cover it with bacitracin ointment to prevent wound infection.

2m



- 6 Place the mouse in a recovery cage. Once the mouse is fully recovered as it regains the righting reflex and ability to stand, return it to its home cage. Respiratory patterns and reactions to surgical stimulation are continuously monitored during the entire surgical procedure.

5m

Expected result

Tissue swelling (ipsilateral: left).





Sham surgery

8m

- 7 The sham surgery comprises anesthesia, antiseptic preparation, and application of topical antibiotics without skin and muscle incision and elevation.

8m