

Jan 08, 2026

Endotracheal Wounding Using Derby Perry Excavator in Wistar Rats

DOI

<https://dx.doi.org/10.17504/protocols.io.ewov1k41ygr2/v1>

Josiah Irma^{1,2}, Arief S. Kartasasmita^{1,3}, Angga Kertiwa³, Irawati Irfani³, Ronny Lesmana^{4,5}, Aziiz Mardanarian Rosdianto^{4,5}, Anglita Yantisetiati⁶, Saraswati Anindita Rizki⁷

¹Doctoral Program in Medical Sciences, Faculty of Medicine, Universitas Padjadjaran, Bandung, Indonesia;

²Ophthalmology Department, Universitas Pelita Harapan, Tangerang, Indonesia;

³Ophthalmology Department, Faculty of Medicine, Universitas Padjadjaran, Bandung, Indonesia;

⁴Department of Biomedical Sciences, Faculty of Medicine, Universitas Padjadjaran, Bandung, Indonesia;

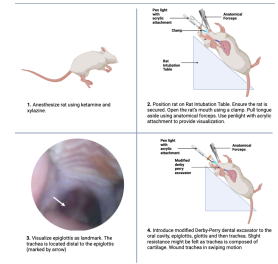
⁵Biological Activity Division, Central Laboratory, Universitas Padjadjaran, Bandung, Indonesia;

⁶Pathology Anatomy Department, Faculty of Medicine, Universitas Padjadjaran, Bandung, Indonesia;

⁷Faculty of Medicine, Universitas Pelita Harapan, Tangerang, Indonesia



Josiah Irma



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.ewov1k41ygr2/v1>

Protocol Citation: Josiah Irma, Arief S. Kartasasmita, Angga Kartiwa, Irawati Irfani, Ronny Lesmana, Aziiz Mardanarian Rosdianto, Anglita Yantisetiati, Saraswati Anindita Rizki 2026. Endotracheal Wounding Using Derby Perry Excavator in Wistar Rats. protocols.io <https://dx.doi.org/10.17504/protocols.io.ewov1k41ygr2/v1>

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: January 06, 2026

Last Modified: January 08, 2026

Protocol Integer ID: 237121

Keywords: Endotracheal Wound, Rattus norvegicus, Wistar Rats, Trachea, Modified Derby Perry Excavator, vivo endotracheal wounding in wistar rat, vivo endotracheal wounding, derby perry excavator in wistar rat, endotracheal wounding, producing endotracheal injury, brush technique in mice, endotracheal injuries in wistar, thickness wound, derby perry dental excavator, brush technique, using derby perry excavator, dental excavator, acrylic attachment, wistar rat, glottis

Abstract

In vivo endotracheal wounding in Wistar rats presents notable technical challenges. Proper animal positioning and adequate illumination are necessary for clear visualization of the glottis and trachea, while selecting an appropriate instrument is critical to avoid perforation or insufficient injury. Although Hillel et al. previously described a wire-brush technique in mice, limited access to this tool motivated the development of alternative approaches. Utilization of a pen light with an acrylic attachment and modified Derby Perry dental excavator provided optimal visualization and generated consistent, controlled partial-thickness wounds. This approach proved to be the most effective technique for producing endotracheal injuries in Wistar rats.

Attachments



SuratCiptaan_EC00202.

3.1MB



SuratCiptaan_EC00202.

3.1MB



Materials

1. Male Wistar Rats (12 weeks old and weighing 200g)
2. Rat Intubation Table (Patented by Josiah Irma, Patent number EC00225045045)
3. Ketamine (PT. Ethica Industry Farmasi, Indonesia)
4. Xylazine
5. Modified Derby Perry Dental Excavator (Patented by Josiah Irma, Patent number EC00225117360; Original Derby Perry Dental Excavator by Bertamed, Indonesia)
6. Pen Light With Acrylic Attachment
7. Micropore Tape
8. Anatomical Forceps
9. Clamp

Methods

- 1 Anesthetize rat using Ketamine and Xylazine.
- 1 Position rat on Rat Intubation Table.
 - 1.1 Ensure the rat's sides are secured, and its body, rear, and front legs are taped using Micropore Tape.
 - 1.2 Position table at 0°
 - 1.3 Attach the rubber to the rat's incisors.
 - 1.4 Tilt tabletop to 60° angle
- 2 Open the rat's mouth using a clamp.
- 3 Pull tongue aside using anatomical forceps.
- 4 Use penlight with acrylic attachment to provide visualization.
- 5 Visualize epiglottis as the landmark. The trachea is located distal to the epiglottis.
- 6 Introduce modified Derby-Perry dental excavator to the oral cavity, epiglottis, glottis and then trachea. Slight resistance might be felt as trachea is composed of cartilage.
- 7 Wound the trachea using a swiping motion.
- 8 Rat was then flipped to pronation position immediately after wounding.





Protocol references

Hillel AT, Namba D, Ding D, Pandian V, Elisseeff JH, Horton MR. An in situ, in vivo murine model for the study of laryngotracheal stenosis. JAMA Otolaryngol Head Neck Surg. 2014;140: 961–966. doi:10.1001/jamaoto.2014.1663