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Atlanto-occipital catheterization of young rats for long-term drug delivery into the lumbar subarachnoid space combined with *in vivo* testing and electrophysiology *in situ*

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Highlights

- A method of lumbar catheterization of young rats (3-week-old) is described.
- The high catheterization success rate was demonstrated for young rats (about 80%).
- No adverse effects on peripheral sensitivity, animal locomotion or anxiety were found after spinal catheterization.
- Whole-cell recordings from sensory interneurons *in situ* are demonstrated following spinal treatment with genetic material *in vivo*.
- The technique is feasible and useful for studies both *in vivo* and *in situ*.

Abstract

BACKGROUND: Catheterization has been widely used in neuroscience and pain research for local drug delivery. Though different modifications were developed, the use of young animals for spinal catheterization remains limited because of a little success rate. A reliable technique is needed to catheterize young animals aimed for *in vivo* testing combined with spinal cord electrophysiology, often limited by animal age, to facilitate pain research.

NEW METHOD: We describe intrathecal catheterization of young rats (3-week-old) through atlanto-occipital approach for long-lasting drug delivery into the lumbar subarachnoid space. The technique represents a surgical approach of minimized invasiveness that requires PE-10 catheter and few equipment of standard laboratory use.

RESULTS: Behavioral assessments revealed that spinal catheterization does not change peripheral sensitivity of different modalities (thermal and mechanical) and gives no rise to locomotive deficit or anxiety-like behavior in young rats. The long-term administration of

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