

Lamina terminalis function

Inferior to the anterior communicating artery was the safer region to open due to the lack of perforating arteries. A working distance of approximately 1 cm can be expected through the LT ¹⁾.

Experience may suggest that hypothalamic dysfunctions should be reminded as a possible, although rare, complication following the opening of the lamina terminalis. This clinical condition, if not properly managed, may contribute to trigger severe life-threatening complications ²⁾.

Signals detected by taste receptors, peripheral osmo-sodium, volume receptors, and arterial/cardiopulmonary baroreceptors reach the [nucleus of the solitary tract](#) (NTS) by the VIIth, IXth, and Xth cranial nerves. The other main brain entry of the information related to fluid and cardiovascular balance are the [lamina terminalis](#) (LT) and one of the sensory circumventricular organs (CVOs), the [area postrema](#) (AP).

The LT, consisting of the median preoptic nucleus (MnPO) and the other two sensory CVOs—i.e., [subfornical organ](#) (SFO) and organum vasculosum of the lamina terminalis (OVLT)—is recognized as a site in the brain that is crucial for the physiological regulation of hydroelectrolyte balance.

The mechanisms involved in cardiovascular regulation, such as vascular tone, fluid volume and blood osmolarity, are quite often mediated by signals circulating in the periphery, such as angiotensin II and sodium concentration. Research has identified areas within the lamina terminalis (LT), specifically the sensory circumventricular organs (CVOs), the subfornical organ and the organum vasculosum of the lamina terminalis, as playing crucial roles detecting and integrating information derived from these circulating signals. The median preoptic nucleus (MnPO) is a third integrative structure within the LT that influences cardiovascular homeostasis, although to date, its role is not as clearly elucidated. More recent studies have demonstrated that the CVOs are not only essential in the detection of traditional cardiovascular signals but also signals primarily considered to be important in the regulation of metabolic, reproductive and inflammatory processes that have now also been implicated in cardiovascular regulation. In this review, we highlight the critical roles played by the LT in the detection and integration of circulating signals that provide critical feedback control information contributing to cardiovascular regulation ³⁾.

Castañeyra-Perdomo et al. speculates on the connection between the development of the medial preoptic area, the organum vasculosum of the lamina terminalis and olfactory bulbs with Kallmann syndrome, since the anteroventral third ventricle region is crucial for the normal development of these structures and its connection with the olfactory nerves and sexual maturation ⁴⁾.

¹⁾

Tubbs RS, Nguyen HS, Loukas M, Cohen-Gadol AA. Anatomic study of the lamina terminalis: neurosurgical relevance in approaching lesions within and around the third ventricle. *Childs Nerv Syst.* 2012 Aug;28(8):1149-56. doi: 10.1007/s00381-012-1831-8. Epub 2012 Jun 8. Review. PubMed PMID: 22678496.

²⁾

Spallone A, Izzo C, Giannone C. Hypothalamic dysfunctions as a late consequence of surgical opening of the lamina terminalis. A controversial hypothesis. *Neuro Endocrinol Lett.* 2012;33(6):590-6. PubMed PMID: 23160226.

³⁾

Cancelliere NM, Black EA, Ferguson AV. Neurohumoral Integration of Cardiovascular Function by the Lamina Terminalis. *Curr Hypertens Rep*. 2015 Dec;17(12):93. doi: 10.1007/s11906-015-0602-9. Review. PubMed PMID: 26531751.

4)

Castañeyra-Perdomo A, Castañeyra-Ruiz L, González-Marrero I, Castañeyra-Ruiz A, González-Toledo JM, de Paz-Carmona H, Castañeyra-Ruiz M, Carmona-Calero EM. What is relationship between the medial preoptic area, the organum vasculosum of the lamina terminalis and Kallmann syndrome? *Med Hypotheses*. 2013 Aug;81(2):219-21. doi: 10.1016/j.mehy.2013.04.046. Epub 2013 May 20. PubMed PMID: 23702295.

From:

<https://neurosurgerywiki.com/wiki/> - **Neurosurgery Wiki**

Permanent link:

https://neurosurgerywiki.com/wiki/doku.php?id=lamina_terminalis_function

Last update: **2024/06/07 02:51**

