

USING THE STEREOTACTIC METHOD FOR NEUROENDOCRINE INVESTIGATION

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The stereotactic method, developed by the English scientists V. Horsley and R. H. Clarke, is one of the most important stages in the development of experimental and clinical neurosurgery. It demonstrates the successful integration of brain anatomy, analytical geometry and neurosurgery, building on the achievements of precision mechanics. The stereotactic method comprises a set of techniques and devices that enable the minimally traumatic implantation of electrodes into the brain. This is based on the prior determination of the coordinates of a specific brain structure and the subsequent insertion of an instrument into the brain. The main methodological principle of the insertion of a stereotactic instrument into the brain is to combine the coordinates of a central nervous system structure, as determined using a stereotactic atlas, with the coordinates of the stereotactic instrument. Using this method ensures strictly localised, low-trauma impact on brain structures, which is essential both in experiments and in clinical practice. However, if we move beyond a purely technical approach and analyse the scientific information obtained using this method, it is worth noting that, in neurobiology, it is not only a highly effective method of brain research, but also a fruitful scientific discipline known as stereotaxis.

By combining precise electrode implantation with controlled destruction, electrical stimulation, and the administration of various pharmacological agents into different brain structures, data was obtained on the localisation of centres that regulate many physiological functions, as well as the peculiarities of their connections with other formations of the central nervous system.

The stereotactic method is often used in neuroendocrinological studies. To increase the accuracy of electrode insertion and localised destruction of the structures that regulate the pituitary-thyroid system, we designed a device that makes it possible to deliver controlled destruction to the hypothalamic structures that regulate the synthesis and secretion of neurohormones. The results of the study using the stereotactic method will be presented in more detail in the report.

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