FIBER TRACT ANATOMY OF THE HYPOTHALAMUS

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Introduction

The hypothalamus has been shown to be a hub for the aggregation cerebrum control of autonomic and endocrine function with continuing emotional and behavior state because of related white matter tracts between brainstem and the cerebrum. However it has been used a target for obesity, behavioral diseases, headaches and movement disorders, the white matter connectivity of the hypothalamus is still incompletely known. Our aim is to define white matter anatomy of the hypothalamic region.
METHODS

12 postmortem human brain specimens were prepared in accordance with Klingler’s method. After studied with the sulcal anatomy, dissections were performed under x6-x40 magnification with a Zeiss Surgical Microscope. Between dissection sessions, the specimens were stored in a 70% alcohol solution. Brain hemispheres were dissected step by step from lateral to medial, medial to lateral, superior to inferior and inferior to superior under operating microscope and three-dimensional images were captured at every stage.
RESULTS

The hypothalamus is located on the undersurface of the brain and lies below the thalamus and above the pituitary gland. The following structures and their relation with the hypothalamus defined anatomically and radiologically. Diagonal band of Broca, the ventral amygdalo-hypothalamic fiber, stria terminalis, fornix are related with the anteromedial part of the hypothalamus; the cingulum, supraoptic commissure, the frontopontine tracts are related with the anterolateral part of hypothalamus; medial longitudinal fasciculus, dorsal longitudinal
fasciculus are related with posteromedial part of the hypothalamus; ansa peduncularis, the postcommissural fornix. The fasciculus mamillaris princeps, the corticospinal tract, the temporoparietooccipitopontine tract, the medial lemniscus, the spinothalamic tract, the mammillotegmental tract and dentorubrothalamic tract, are related with the posterolateral part of the hypothalamus; the fasciculus retroflexus, the mammillothalamic tract are lies superior to inferior part of hypothalamus.

Depression, obsessive compulsive disorder, behavioral disorders associated with the anterior part of the hypothalamus Broca'nın diagonal band, ventral amygdala hipothalamic fiber, supraoptic commissure, cingulum and fornix can be applied to the
target of deep brain stimulation of the anterior hypothalamus, but also for the treatment of lateral obesity can be used as the target point of the medial forebrain band and mamillotegmental pathway located in the lateral nucleus located in the hypothalamus and the pathways associated therewith; corticospinal tract, dentorubrotalamic tract and temporoparietooccipitopontin tract, fascicullary retroflexus, postcommissural fornix are the areas that can be selected as target areas.
DISCUSSION

Hypothalamus is a very important and complex area for neurosurgeons, therefore, we tried to the definition and We hypothesized that the hypothalamus is connected to specific tracts and therefore may have a new target for Epilepsy, obesity, hypertension, depression, headaches, and movement disorders and When DBS planning is performed, the hypothalamus is divided into anterior, posterior, superior, inferior, lateral and medial sections according to the AC-PC line and mamillothalamic tract which we refer to will provide ease for surgical preparation.
SUMMARY POINTS

Understanding the fiber network of hypothalamus can help to define more accurate targets for deep brain stimulation in specific diseases.