

Structure and Location of the Pineal Gland: Its Development and Symmetry

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Perspective

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DESCRIPTION

In the majority of vertebrates' brains, the pineal gland, also known as the conarium or epiphysis cerebri, is a small endocrine gland. The pineal organ produces melatonin, a serotonin determined chemical which regulates rest designs in both circadian and occasional cycles. The gland's name comes from its resemblance to a pine cone. The pineal organ is situated in the epithalamus, close to the focal point of the cerebrum, between the two sides of the equator, wrapped up a depression where the two parts of the thalamus join. It is one of the circumventricular organs that secrete neuroendocrine hormones and have mostly blood-permeable capillaries.

Most vertebrates have a pineal gland, but protochordates, which have a simple pineal homologue, do not have one. The hagfish, considered as a crude vertebrate, has a simple construction viewed as the "pineal same" in the dorsal diencephalon. In certain types of species of land and water and reptiles, the organ is connected to a light-detecting organ, differently called the parietal eye, the pineal eye or the third eye. The pineal gland evolved into a neuroendocrine organ from a type of atrophied photoreceptor, according to a reconstruction of the biological evolution pattern.

Structure and location

The pineal gland is an unpaired structure in the middle of the brain. Because of its pinecone shape, it gets its name. The organ is ruddy dim and about the size of a grain of rice (5-8 mm) in people. The pineal body, also known as the pineal gland, is a part of the epithalamus and is located behind the habenular commissure, between the thalamic bodies that are positioned laterally. It can be found close to the quadrigeminal corpora in the quadrigeminal cistern. It is also behind the third ventricle, and a small pineal recess in the third ventricle that extends into the gland's stalk supplies cerebrospinal fluid to it.

Blood supply: The pineal gland, unlike the majority of the mammalian brain, is not isolated from the body by the blood-brain barrier system. Instead, it receives abundant blood flow from the choroidal branches of the posterior cerebral artery, second only to the kidney.

Nerve supply: The pineal organ gets a thoughtful innervation from the predominant cervical ganglion. There is also a parasympathetic innervation coming from the otic and pterygopalatine ganglia. In addition, the pineal stalk is used by some nerve fibers to enter the pineal gland (central innervation). Additionally, nerve fibers containing the neuropeptide PACAP are sent to the gland by neurons in the trigeminal ganglion.

Development

The human pineal organ fills in size until around 1-2 years old, staying stable from there on, despite the fact that its weight increments steadily from adolescence onwards. Pineal tumors have been linked to precocious puberty, and it is believed that children's high levels of melatonin prevent them from developing their sexuality. At the point when adolescence shows up, melatonin creation is diminished.

Symmetry

In the zebrafish, the pineal gland exhibits a left-sided bias rather than straddling the midline. A subtle anatomical asymmetry is accompanied by functional cerebral dominance in humans.