



PITUITARY TUMORS

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This overview will help you understand your neurosurgeon, and you will understand better what treatment your doctor is recommending for you. The Pituitary Gland is very unique and like no other, complex hormonal controls and critical in many ways to the whole body, you should take time to make questions to better understand it.

PITUITARY TUMORS

The pituitary gland is a small structure attached to the base of the brain (behind the nose), where it is protected by a part of the skull called the sphenoid bone. A normal pituitary gland is about the size and shape of a kidney bean and is responsible for controlling and coordinating: 1) growth and development; 2) the function of various body organs (i.e. kidneys, breasts and uterus); and 3) the function of other glands (i.e. thyroid, gonads, and adrenal glands).



The pituitary gland performs these functions by releasing several signaling hormones that, in turn, control the activities of other organs. The function of the pituitary is analogous to a household thermostat. The thermostat constantly measures the temperature in the house and sends signals to the heater to turn on or off to maintain a steady, comfortable temperature. The pituitary gland constantly monitors body functions and sends signals to remote organs and glands to control their function and maintain the appropriate environment. The ideal "thermostat" setting depends on many factors such as level of activity, gender, body habitus, and others.

The pituitary gland itself, is connected to and controlled by the hypothalamus, a region of the brain located just above the pituitary. The pituitary and hypothalamus

work together to regulate the daily functions of the body, as well as play an essential role in growth, development and reproduction. The hypothalamus and pituitary comprise the neuroendocrine system.

The pituitary gland has two distinct parts, the "anterior pituitary" is closest to the front of the head, while the "posterior pituitary" is closest to the back of the head. These parts contain different cells and release different hormones and thus are responsible for different control duties. The anterior pituitary is formed from the same tissue as the pharynx (the upper part of the mouth). The posterior pituitary develops from the bottom portion of the brain, and is directly connected to the hypothalamus.

REGIONS OF THE PITUITARY

The anterior pituitary represents approximately 80 percent of the pituitary gland, and is composed of the anterior lobe and the intermediate zone. The anterior lobe is responsible for the majority of the signaling hormones released into the blood stream. The specific hormones include growth hormone (GH), thyroid stimulating hormone (TSH), adrenocorticotropic hormone (ACTH), follicle stimulating hormone (FSH), leutinizing hormone (LH), melanocyte stimulating hormone (MSH), and endorphin (beta-END).

The posterior pituitary develops very early in life and does not make any hormones of its own. Instead, it contains the nerve endings of brain cells (neurons) that arise from the hypothalamus. These neurons produce vasopressin and oxytocin that are then transported down the pituitary stalk into which attaches the posterior pituitary to the hypothalamus. They are stored for later release into the bloodstream.

Pituitary Adenomas

Pituitary adenomas are benign tumors (meaning that they are non-cancerous) that arise within the anterior pituitary. Although it can be frightening to have a tumor beneath the brain, it is important to note that these tumors are generally non-aggressive, non-cancerous and non-metastatic do not spread to other parts of the body. Adenomas are basically growths found on or within the pituitary gland. These tumors are quite common and represent about 10-15 percent of all intracranial tumors. Adenomas are by far the most common disease affecting the pituitary, and are usually found in people in their 30s or 40s. Most of these tumors can be successfully treated.

Pituitary tumors can vary in size and behavior. Tumors smaller than 10 mm are called "microadenomas," and often secrete anterior pituitary hormones. These smaller, functional adenomas are usually detected earlier because the increased levels of hormones cause abnormal changes in the body. Approximately 50 percent of pituitary adenomas are diagnosed when they are smaller than 5 mm in size. Adenomas larger than 10 mm (the size of a dime) are called "macroadenomas," and usually do not secrete hormones. These tumors are often

discovered as they produce symptoms by compressing nearby brain or cranial nerve structures.

The symptoms of a pituitary tumor generally result from endocrine dysfunction. The dysfunction can be either overproduction of signaling hormones as is the case with acromegaly (giantism) and growth hormone, or the result of underproduction of signaling hormones as in hypothyroidism. Because of its strategic location within the skull, tumors of the pituitary can compress important brain structures as they enlarge. The most common circumstance involves compression of the optic nerves leading to a gradual loss of vision. The visual loss usually begins with a deterioration of lateral peripheral vision on both sides.

When a pituitary tumor is suspected, endocrinologic testing (hormone testing of the blood and urine) and imaging studies of the brain (MRI is the most useful) are necessary. Ophthalmologic testing (vision testing) is also an important part of the evaluation.

Treatment for pituitary tumors includes conservative measure with observation, serial imaging, and/or medications, or surgical resection. There are two main surgical approaches:

- 1) the trans-sphenoidal approach (an approach that involves making an incision in the upper gum line or nasal cavity and attacking the tumor through the base of the skull); or
- 2) transcranial approach (through the upper part of the skull).

The trans-sphenoidal approach is usually the procedure of choice because it is less invasive, has fewer side effects, and patients generally recover more quickly. Patients can often leave the hospital four days after surgery. In certain cases, the use of endoscopic surgery (a technique that uses small fiberoptic tubes to visualize the tumor) may further decrease the length of hospitalization.