Pinealoma

Pinealoma is a tumor of the pineal gland. This gland is a small midline structure located rostro-dorsal to the superior colliculus and between the thalamic bodies. It produces the serotonin derivative melatonin, which is a hormone that plays a role in regulating circadian rhythms. The most common tumors found in the pineal gland include germinomas and teratomas. Due to disruption of melatonin secretion, a pinealoma can cause insomnia. Enlargement of the gland can also compress the vertical gaze center located in the superior colliculus causing paralysis of upward gaze and Parinaud’s syndrome. Compression of the aqueduct of Sylvius in the third ventricle can also lead to obstructive hydrocephalus.

PLAY PICMONIC

Pathophysiology

Melatonin
Melon-tonic
Melatonin is a serotonin derivative that plays an important role in regulating circadian rhythms. This hormone is secreted by the pineal gland.

Superior Colliculi
Soup Cauliflower
The superior colliculus is a structure of the midbrain that plays an important role in directing eye movements. This region houses the vertical gaze center and disruption can lead to paralysis of upward gaze.

Obstructs Cerebral Aqueduct
Obstructed Aqueducts
The pineal gland is located near the cerebral aqueduct and can cause compression, leading to hydrocephalus.

Signs and Symptoms

Obstructive Hydrocephalus
Hydras
Hydrocephalus is a medical condition characterized by abnormal accumulation of CSF in the ventricles of the brain, causing increased intracranial pressures. Obstruction of the cerebral aqueduct leads to hydrocephalus in pinealomas.

Vomiting
Vomit
As pinealomas are tumors which compress surrounding areas of the brain and intracranial structures, patients can develop vomiting. This is a common neurologic response to increased intracranial pressure and mass.

Parinaud's Syndrome
Pear-nut Eyes
Parinaud's syndrome refers to a group of eye movement abnormalities and pupil dysfunction caused by lesions of the upper midbrain. Eye movement abnormalities include paralysis of upward gaze, pseudo-Argyll Robertson pupils, nystagmus, eyelid retraction, and conjugate downward gaze.

Paralysis of Upward Gaze
Wheelchair Up-arrow Eyes
Paralysis of upward gaze refers to the inability to move the eyes in an upward position, caused by damage to the vertical gaze center of the superior colliculus.

Setting Sun Sign

Sun Setting Eyelids

Setting-sun sign is a phrase commonly used to describe conjugate downward gaze, commonly seen in Parinaud's syndrome, often caused by damage to the dorsal midbrain.

Increased Beta-hCG

Up-arrow Pregnant Beta-fish

Pinealomas are associated with causing interruptions of hypothalamic inhibition pathways and can have elevated beta hCG secretion. beta hCG is a hormone normally produced during pregnancy, and is a pituitary analogue of luteinizing hormone. When beta hCG is present at high levels, it can act on LH receptors and lead to increase sex hormone production.

Precocious Puberty

Pubescent-baby

This term refers to an unusually early presentation of puberty. Pinealomas are associated with causing interruptions of hypothalamic inhibition pathways and can have elevated beta hCG secretion. Elevated beta hCG levels lead to Leydig cell stimulation and increased production of sex hormones, causing precocious puberty.