

S21 Medical Imaging Used to Diagnose and Treat Pituitary Adenoma

1. Define Pituitary Adenoma and how imaging modalities can help with diagnoses
2. Describe the treatments associated with Pituitary Adenoma

What is a Pituitary Adenoma?

-Pituitary Adenomas are benign (non-cancerous) tumors that arise from the pituitary gland at the base of the skull. Growth of the tumor begins on the anterior surface of the pituitary but in rare cases, can grow posterior. The cause of this growth is widely unknown but has been linked to genetic mutations. Due to the nature of the pituitary gland which controls our body's growth functions, these tumors can pose a serious risk.

Two classifications of Adenomas:

1. Microadenoma (<1 cm in diameter)

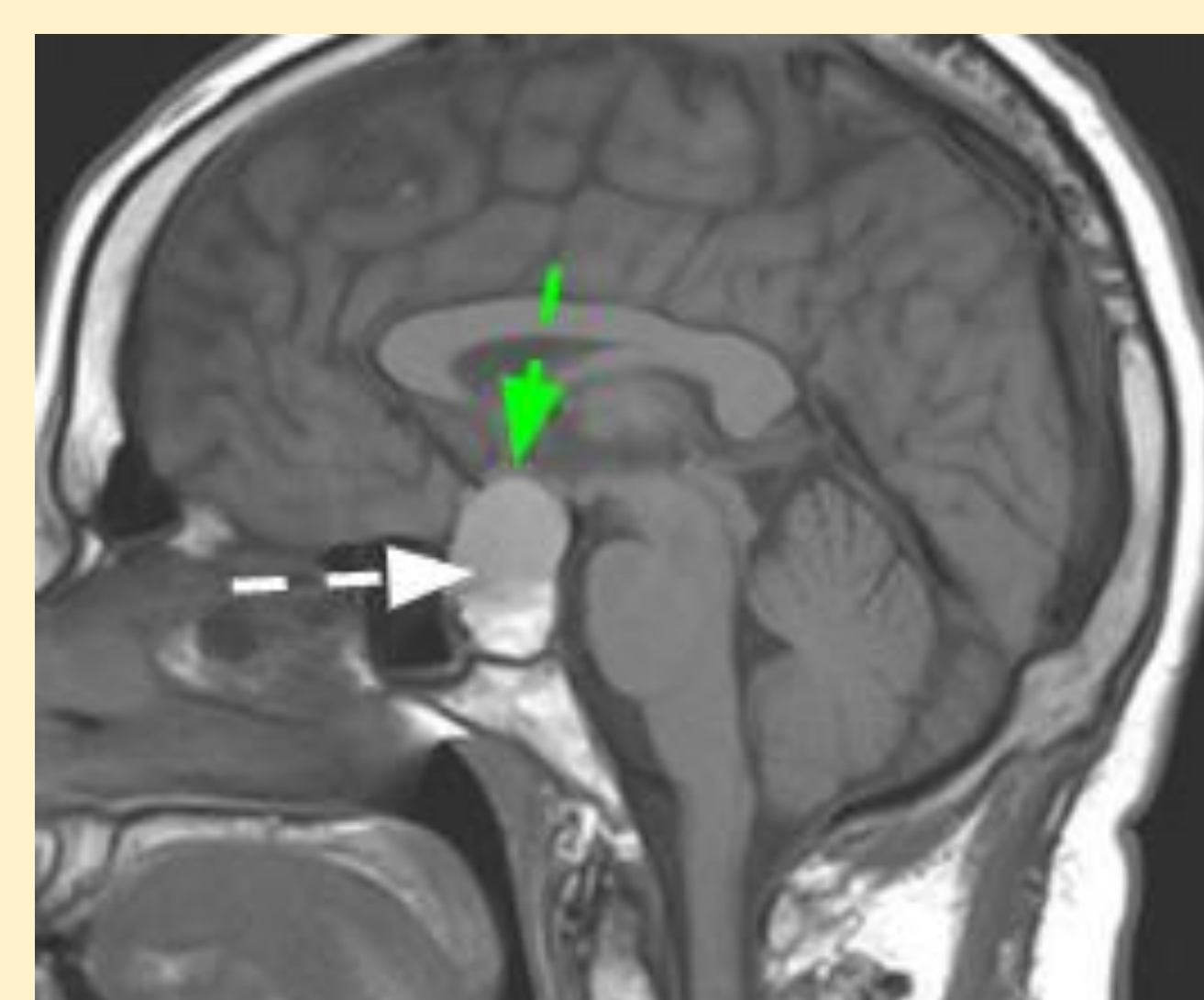
- Microadenomas pose a very small risk of injury to the patient. They can create small hormone imbalances in the brain but will often go undetected.

2. Macroadenoma (>1 cm in diameter)

- Macroadenomas pose a large risk on the patient. At this size, the tumor can press against sensitive structures of the brain such as optic and cranial nerves. This pressure can lead to intense headaches and vision loss. This amount of growth also causes excessive hormone secretion which can damage the functions of brain.



Microadenoma

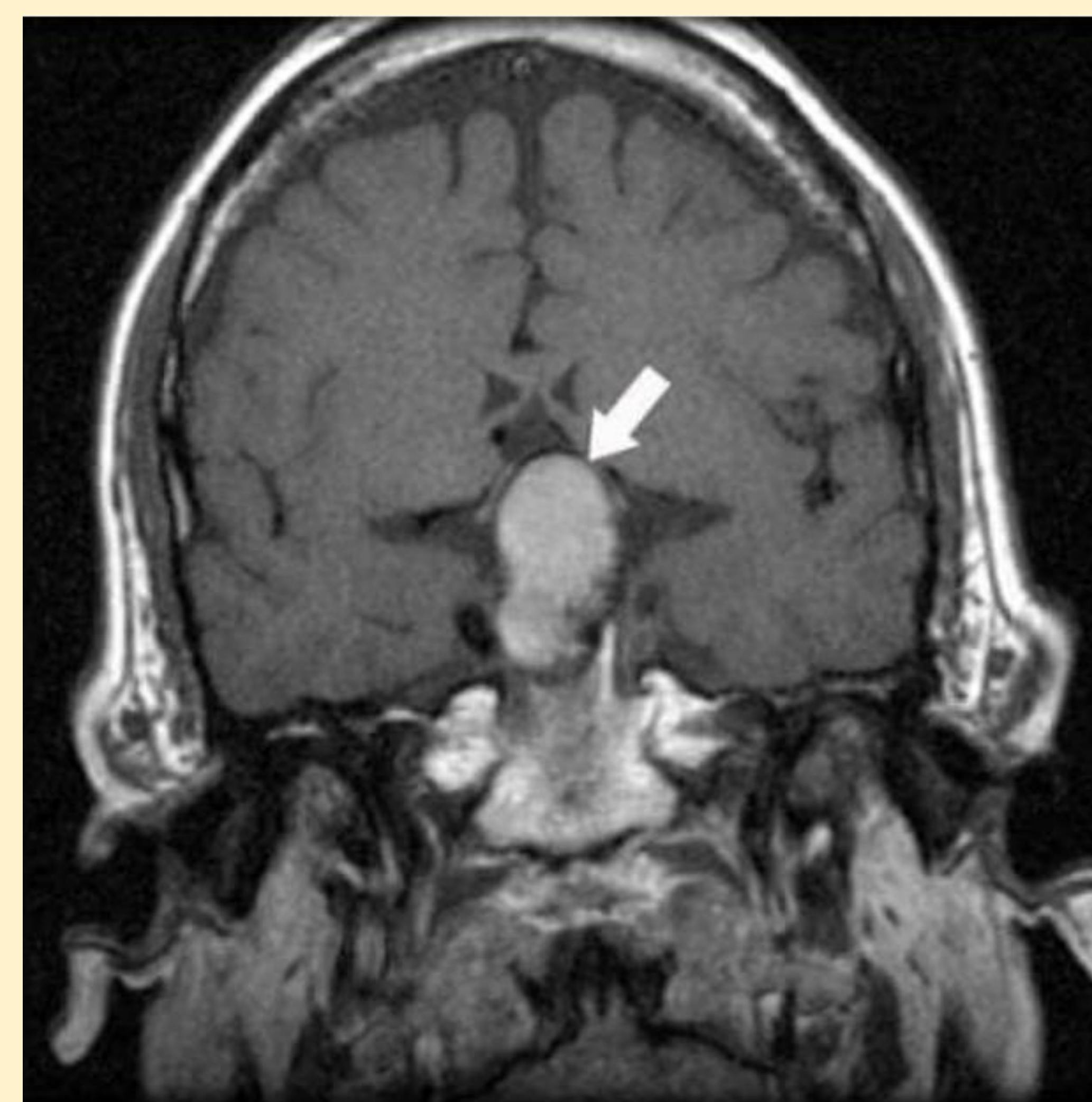


Macroadenoma

What imaging modalities are best for diagnosing pituitary adenomas?

MRI: The use of magnetic resonance can create a detailed image of the brain in which the adenoma can be identified. This modality can also be used to determine the size and location of the tumor. The use of non-ionizing radiation in this modality is very useful. It allows patients to receive regular checkups to track growth and spreading of the tumor without receiving an ionizing dose.

CT: While not as detailed as MRI, CT can also provide identification of these tumors. This modality is typically only used for larger tumors as they become an increased threat to the patient. The scan will create a full map of the brain, giving surgeons better information if planning a surgery is needed.



How can we treat pituitary adenomas?

The Goal: To restore proper hormone level and function of pituitary if possible. If not possible the goal is the prevent further damage to the pituitary gland and surrounding anatomy.

Nonsurgical: No treatment, watch and wait, and medication. This is most common in small pituitary adenoma with little to no growth rate. These treatments are also preferred for adenoma that have little to no effect on the hormones released from the pituitary.

Radiation Therapy: Uses 3D models made from CT scans to pinpoint tumors and treat them with localized high energy radiation. The goal for using Radiation therapy on pituitary adenomas is the slow or stop the growth, and to prevent the adenoma from making harmful hormones,

Endoscopic Trans-nasal Transsphenoidal Surgery: Uses MRI and magnets to help the neurosurgeon to track the location of the endoscope as it travels through the nasal cavities and the sphenoidal sinus to the adenoma for removal.

