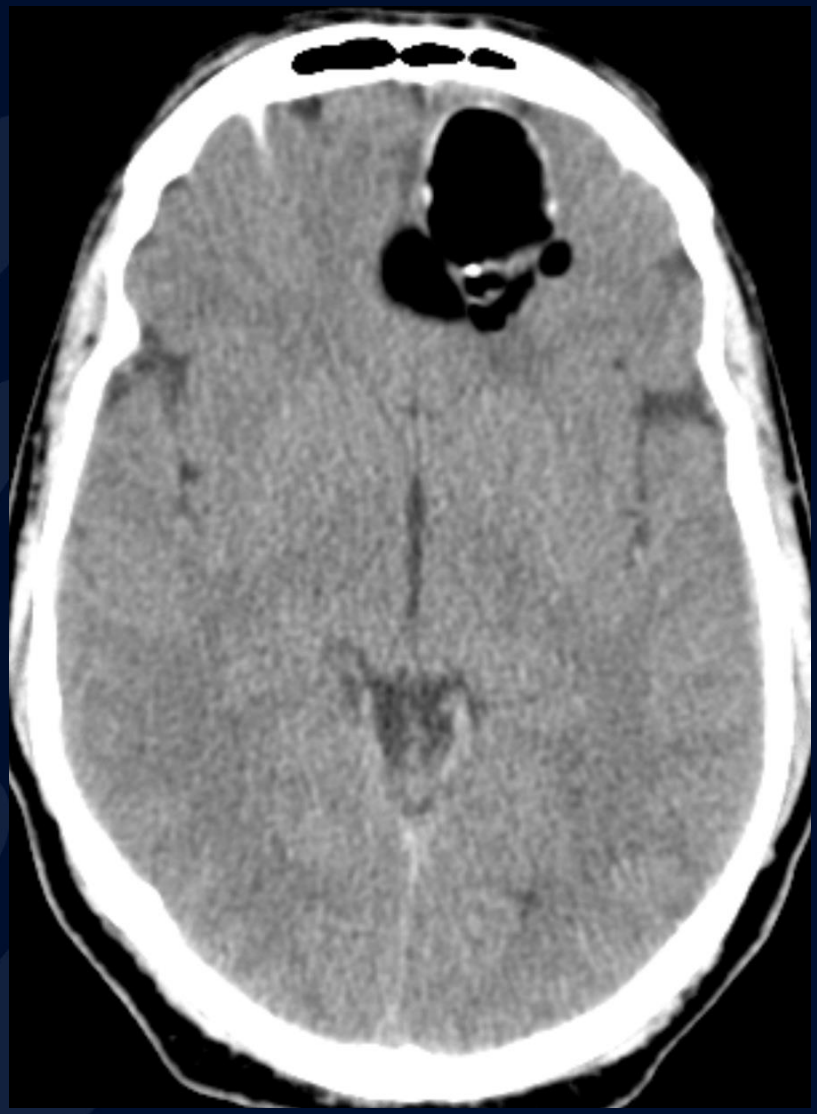
42-year-old male with headache

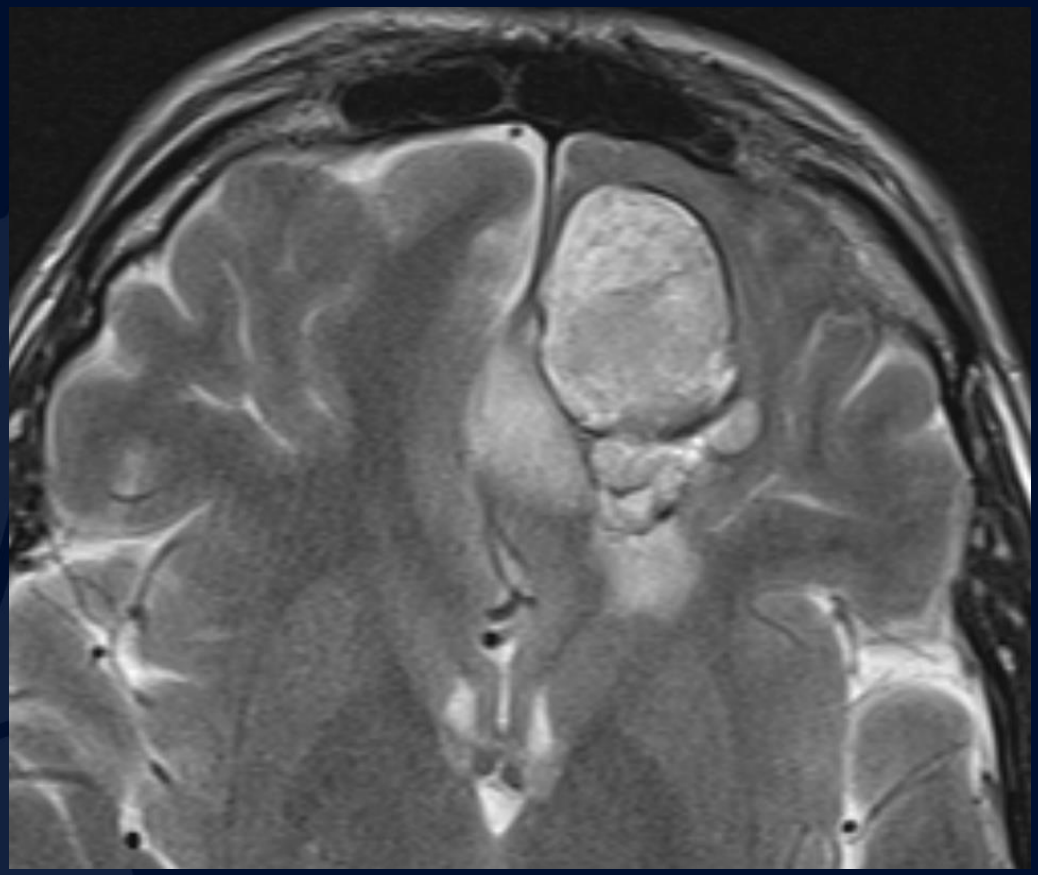
Keerthana Sharma Anand, MBBS
Clifford Yang, MD

UCONN HEALTH
RADIOLOGY



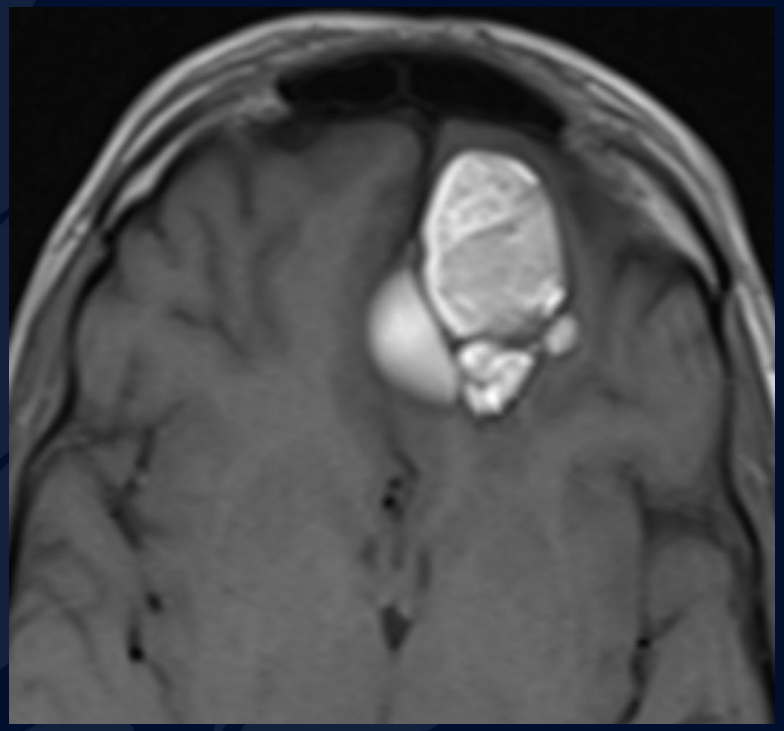
NECT Axial

UCONN HEALTH
RADIOLOGY

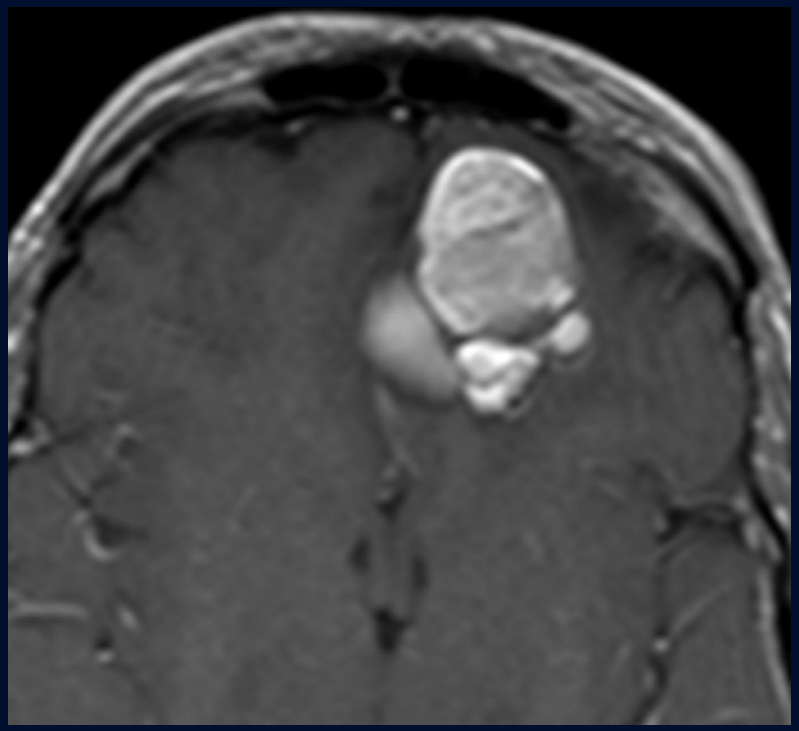


T2 Axial

UCONN HEALTH
RADIOLOGY



T1 Axial



T1 Axial Post Contrast

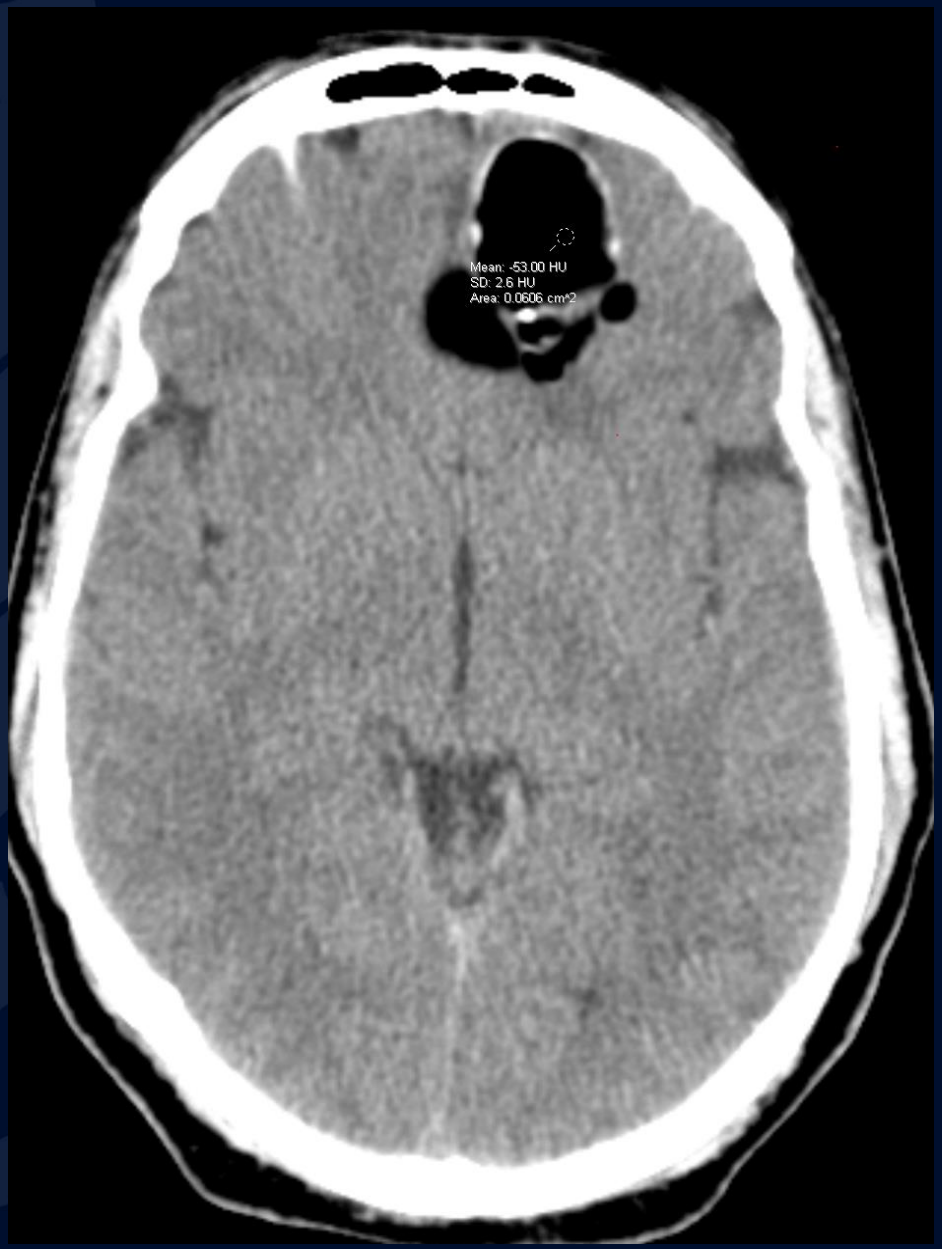
UCONN HEALTH
RADIOLOGY

?

UCONN
HEALTH
RADIOLOGY

Intracranial Dermoid Cyst

UCONN HEALTH
RADIOLOGY



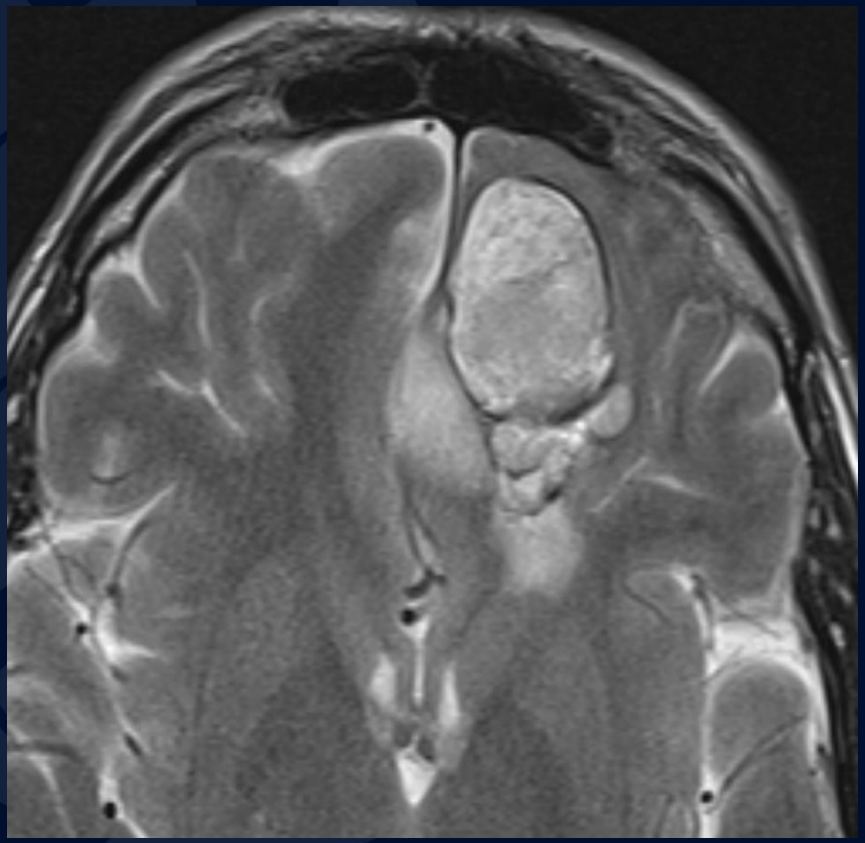
CT Axial

Lobulated, low attenuating mass with fat density (-53 HU) seen in the frontal lobe.

Although dermoid cysts do not contain adipose tissue, cholesterol and sebaceous secretions have the density of fat.

Also seen is a rim of calcification in the wall of the cyst.

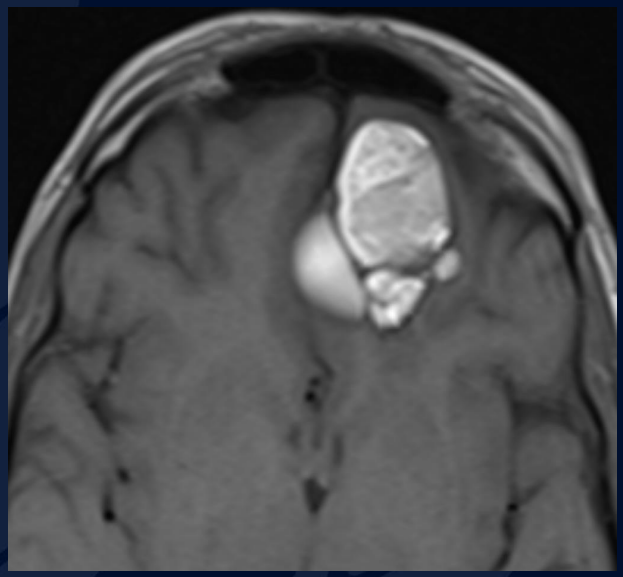
UCONN HEALTH
RADIOLOGY

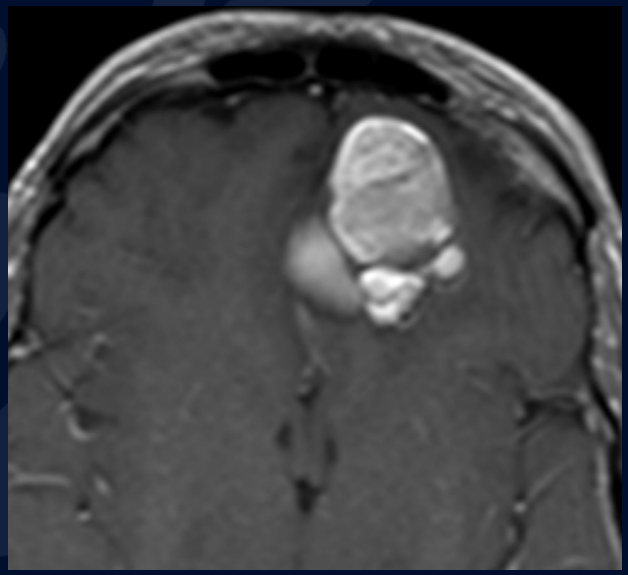


T2 Axial

Unruptured cyst that is heterogenous and hyperintense in appearance.
Black line at the cyst periphery is probably due to calcium and not chemical shift artifact.
This appearance is typical for a dermoid cyst.

UCONN HEALTH
RADIOLOGY





T1 Pre and Post Contrast

Similar appearance on T1 sequences showing unruptured, hyperintense cyst.

Although enhancement is difficult to determine given hyperintense pre T1 signal, no enhancement is seen.

UCONN HEALTH
RADIOLOGY

Intracranial Dermoid Cyst

Definition:
Benign ectodermal cyst with squamous epithelial lining containing dermal elements, hair follicles, sweat and sebaceous glands.

Pathology: Developmental anomaly when embryonic ectoderm is trapped within neural tube during closure. Can also arise from traumatic/ iatrogenic implantation.

Associated conditions:
- Goldenhar syndrome (oculoauriculovertebral dysplasia): can have cranial and ocular dermoids
- Klippel Feil syndrome (KFS): associated with intracranial or spinal dermoid and epidermoid cysts.

UCONN HEALTH
RADIOLOGY

Imaging Findings

Location: Midline or paracentral. Most commonly seen in sellar, suprasellar, frontonasal regions and posterior fossa.
Extracranial sites include orbit and spine.
May have fistulous connections to overlying skin.

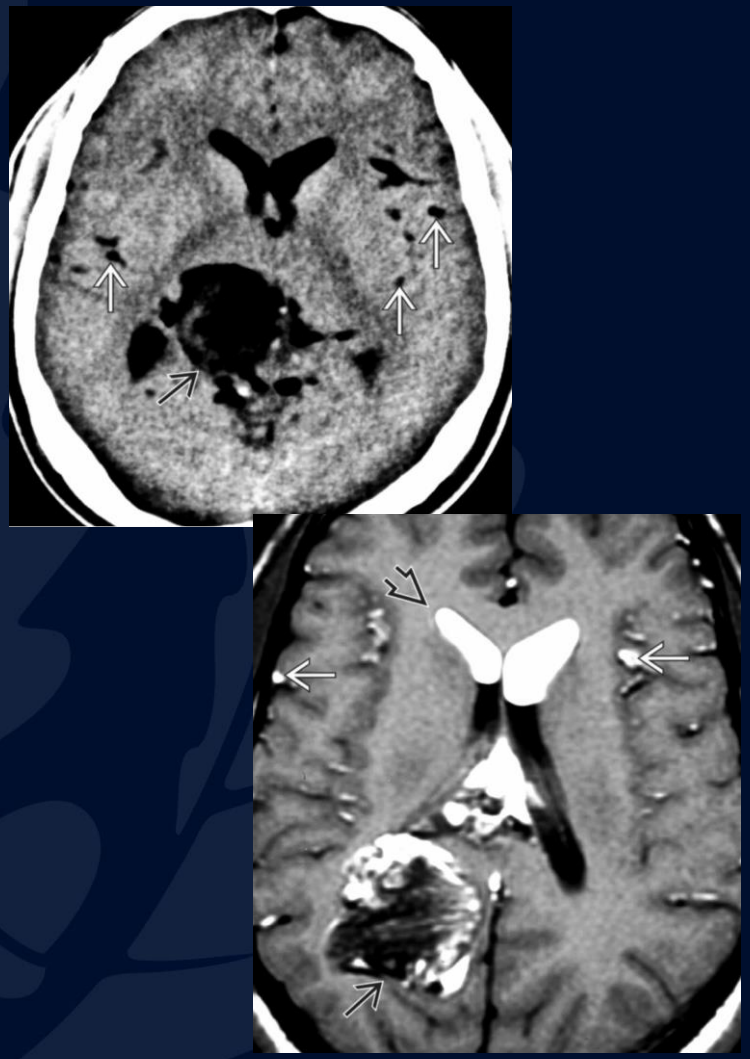
Findings with Unruptured Cyst
CT: Hypodense, lobulated cystic masses, may have calcification of the wall. Hyperdensity only rarely seen with saponification, bleeding or microcalcification.

MRI: MR with fat saturation is the modality of choice for Dx.

- Hyperintense, heterogenous appearance on T1 and T2
- Non-enhancing. Capsule may show mild enhancement.
- Chemical shift artifact may be present.
- Curvilinear hypointensities seen with hair

DWI: Variable. Restriction may occur with more solid content.

UCONN HEALTH
RADIOLOGY



Ruptured Dermoid Cyst

Most common complication of dermoid cyst is cyst rupture. Larger cysts have higher risk of rupture.

Imaging:

- CT: hypodense fat droplets in cisterns and cortical sulci.
- MRI: Hyperintense droplets with fat-fluid level in ventricles. Meningeal thickening may be seen due to aseptic meningitis.

Clinical features: Can cause aseptic meningitis, hydrocephalus, seizures and infarcts (vasospasm due to irritation by fat droplets).

Images from StatDx Dermoid Cyst, Luke L. Linscott, MD; Chang Yueh Ho, MD; Surjith Vattoth, MD, FRCR

UCONN HEALTH
RADIOLOGY

Clinical presentation of Dermoid cysts:

- Most commonly present with headache, rarely seizures.
- Suprasellar masses can cause hypopituitarism, visual defects, diabetes insipidus.
- Hydrocephalus from direct compression or obstructing fat globules after rupture.
- Aseptic meningitis from cyst rupture.
- Recurrent meningitis in case of dermal sinus tract.

Treatment:

- Complete surgical resection. Residual capsule/ contents may lead to recurrence. Rare malignant transformation into squamous cell carcinoma from residual contents.
- Shunt placement for hydrocephalus.

UCONN HEALTH
RADIOLOGY

Differential Diagnoses

- Lipoma: Calcifies less frequently. Dermoids more heterogenous in appearance.
- Epidermoid cyst: Resembles CSF; however unlike CSF, there is restricted diffusion on DWI. Some very dense dermoids can also show restricted diffusion. Epidermoid cysts do not have fat.
- Craniopharyngioma: strongly enhancing, often calcify
- Teratoma: more heterogeneous with solid components that may enhance

References

- Orakcioglu, B., Halatsch, ME., Fortunati, M. *et al.* Intracranial dermoid cysts: variations of radiological and clinical features. *Acta Neurochir (Wien)* **150,** 1227–1234 (2008). https://doi.org/10.1007/s00701-008-0152-x
- Radiopaedia: Intracranial dermoid cyst. https://radiopaedia.org/articles/intracranial-dermoid-cyst-1?lang=us
- Intracranial Dermoid Cyst. Sharma K. Yang C. Radiology Online (2021)
- STATdx: Dermoid Cyst, Luke L. Linscott, MD; Chang Yueh Ho, MD; Surjith Vattoth, MD, FRCR.

UCONN HEALTH
RADIOLOGY