AMSER Case of the Month: November 2022

77-Year-Old Female with New Onset Confusion and Slurred Speech

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Patient Presentation

- HPI: Patient with history of pituitary macroadenoma with a prolonged hospital course due to bilateral lower extremity cellulitis and AMS.
  - On hospital day 24, patient developed a worsening neurological exam, inability to follow commands as well as asymmetric reactive pupils (L>R).
  - Ultimately requiring emergent intubation.

Pertinent Labs

- Complete blood count:
  - Hemoglobin: 8.6 (low)
  - Hematocrit: 28.2 (low)
  - INR: 14.6 (high)
  - PTT: 63 seconds (high)
- Prolactin: 79.7 (high)

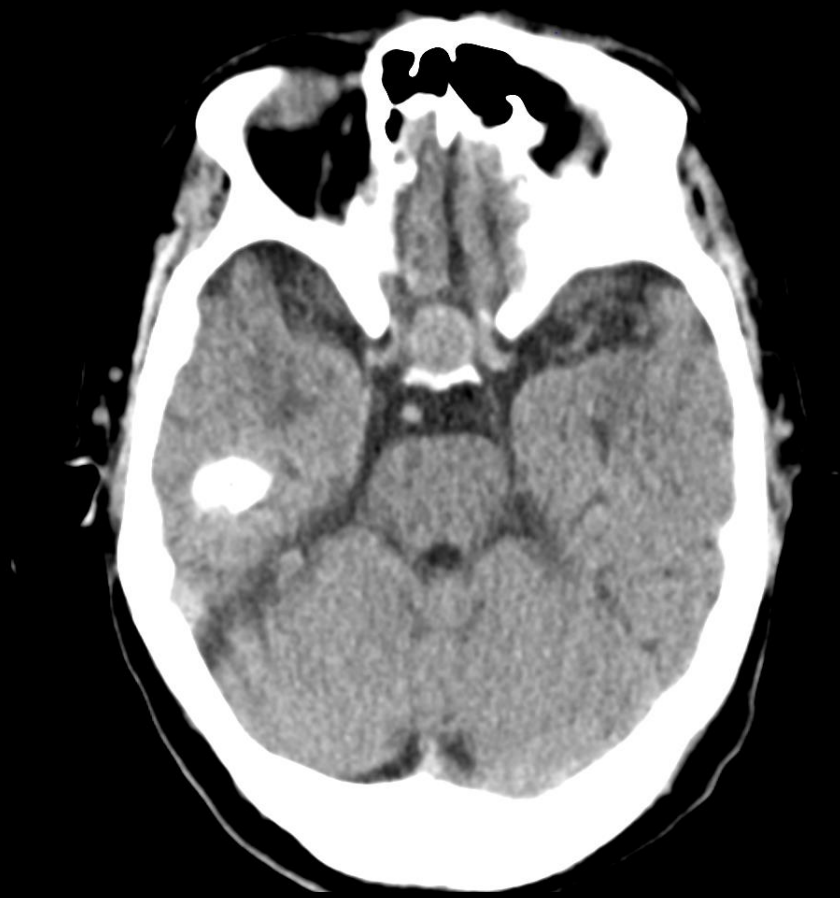
What Imaging Should We Order?

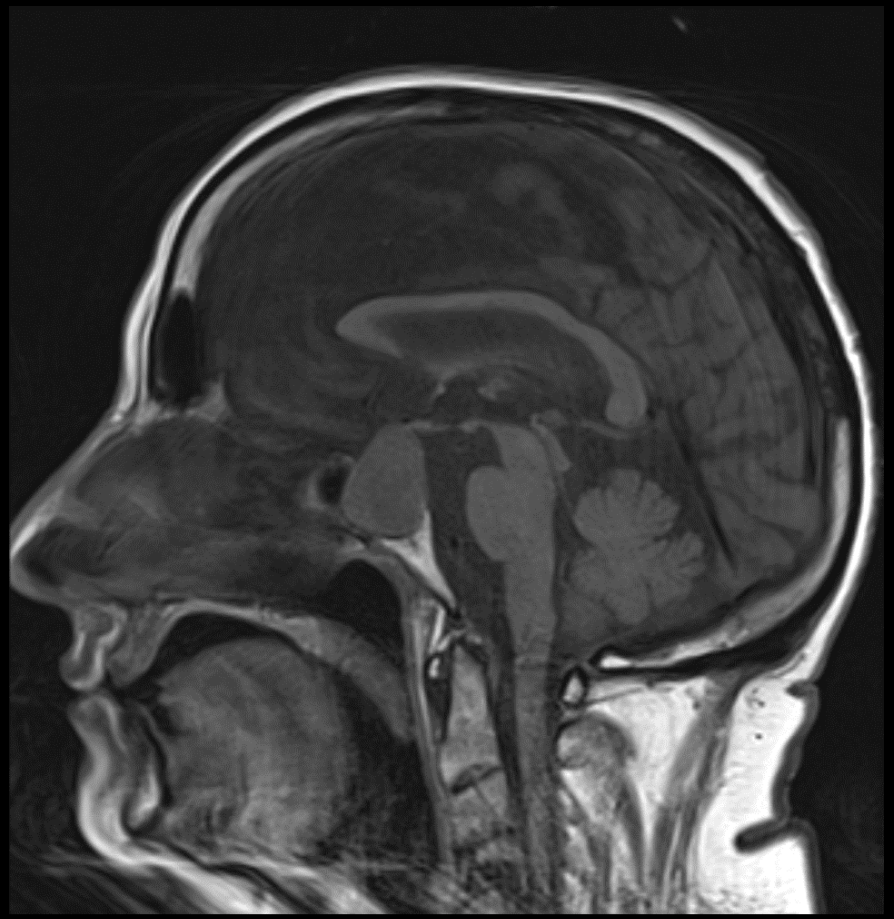
Select the applicable ACR Appropriateness Criteria

Procedure	Appropriateness Category	Relative Radiation Level
MRI sella without and with IV contrast	Usually Appropriate	O
MRI sella without IV contrast	Usually Appropriate	O
CT sella without IV contrast	May Be Appropriate (Disagreement)	☢☢☢
CT sella with IV contrast	May Be Appropriate	☢☢☢
MRI sella with IV contrast	May Be Appropriate	O
CTA head with IV contrast	Usually Not Appropriate	☢☢☢
CT sella without and with IV contrast	Usually Not Appropriate	☢☢☢
MRA head with IV contrast	Usually Not Appropriate	O
MRA head without and with IV contrast	Usually Not Appropriate	O
MRA head without IV contrast	Usually Not Appropriate	O
Radiography sella	Usually Not Appropriate	☢
Venous sampling petrosal sinus	Usually Not Appropriate	Varies

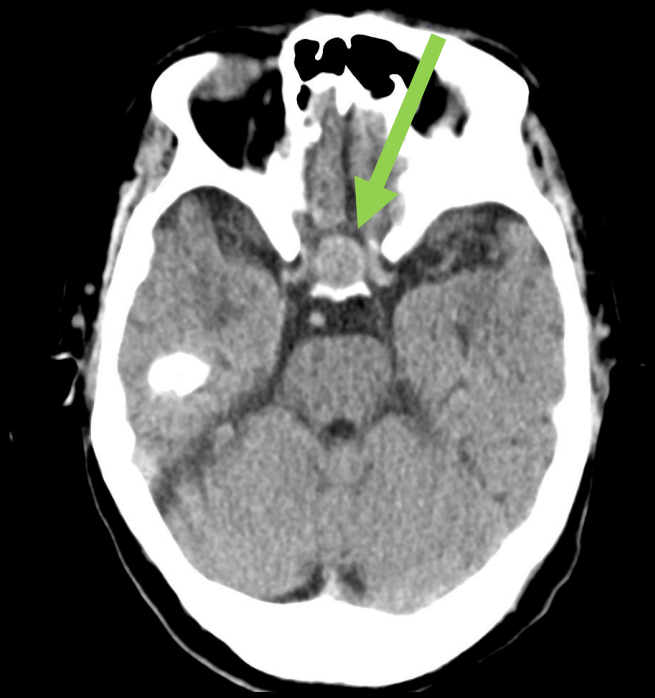
This imaging modality was ordered by neurosurgery upon consultation

Findings prior to neurological decline (unlabeled)



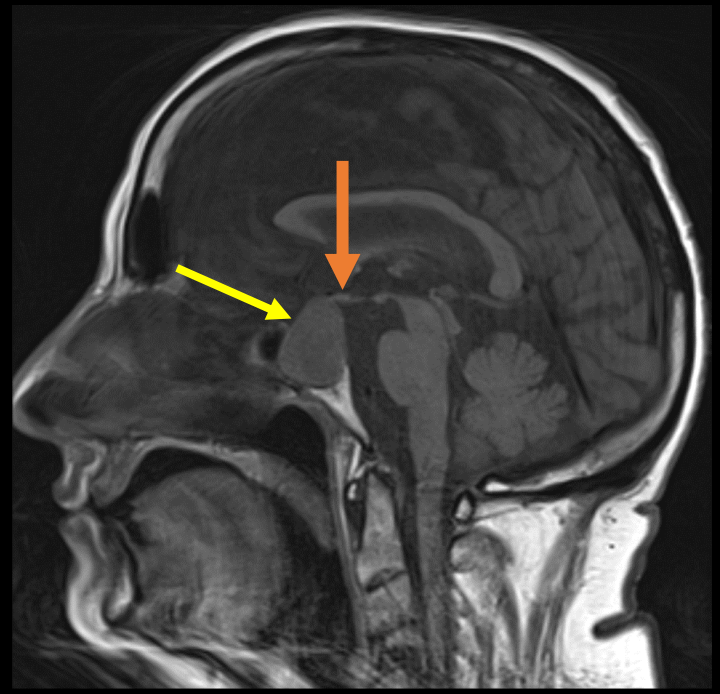


Findings prior to neurological decline (labeled)



Non contrasted CT

Initial CT shows a slightly hyperdense well circumscribed sellar lesion (green arrow).



T1 sagittal non contrast MRI

Following MRI shows a solid homogenous sellar mass in the pituitary fossa with suprasellar extension (yellow arrow). This is likely a macroadenoma with compression of the optic chiasm (orange arrow).

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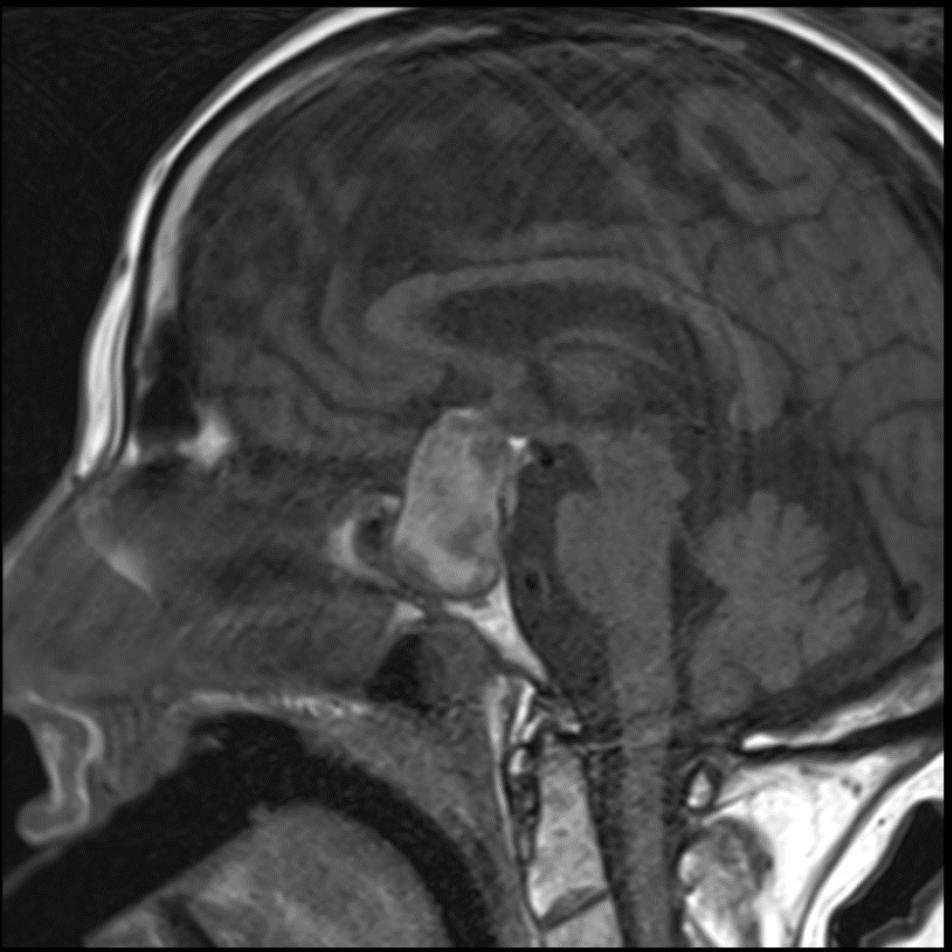
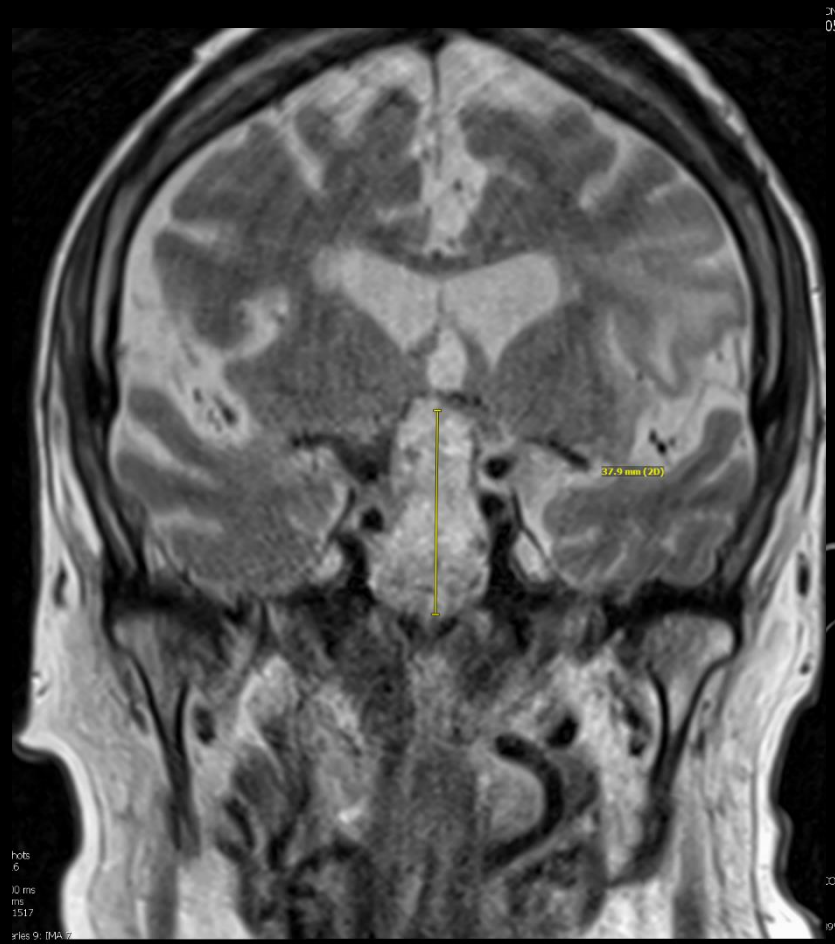
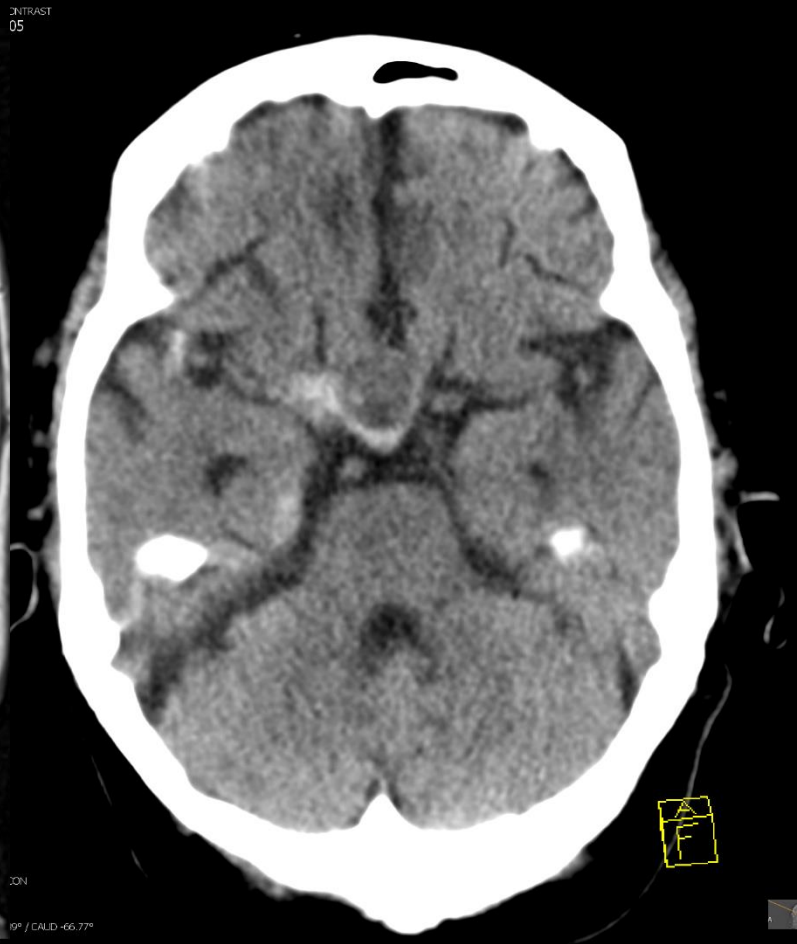
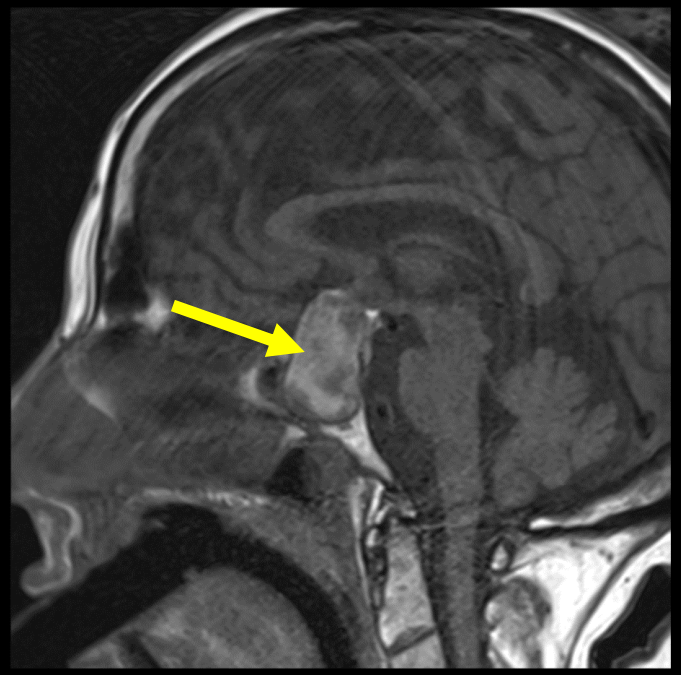
Findings after neurological decline (unlabeled)





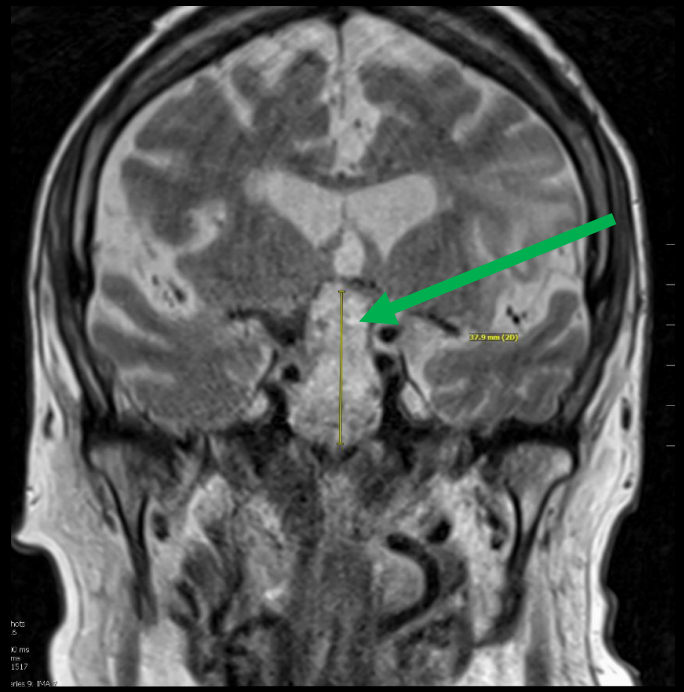


Findings after neurological decline (labeled)



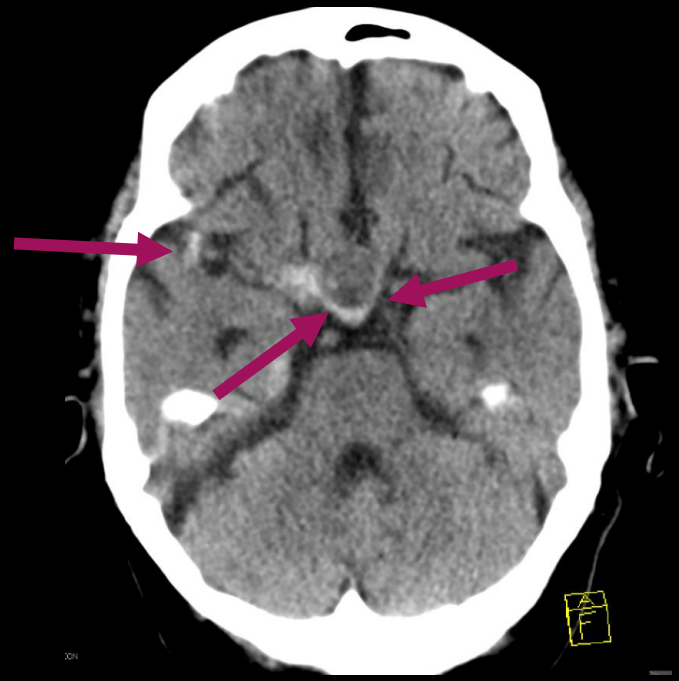
T1 sagittal non contrast enhanced MRI

Interval MRI reveals increase in size of the mass with worsening compression of the optic chiasm and new heterogenous T1 hyperintense signal indicating hemorrhage (yellow arrow).



T2 coronal MRI

Heterogeneous T2 hyperintensity related to edema/hemorrhage within the pituitary macroadenoma, (green arrow).



Non contrast CT head

Interval CT reveals hyperdensity surrounding the sellar mass and extending into the right Sylvian fissure, indicating subarachnoid hemorrhage (purple arrows).

Final Dx:

Pituitary Apoplexy

Case Discussion

- Epidemiology
  - Pituitary apoplexy primarily occurs due to hemorrhagic infarct of the pituitary gland due to pre-existing macroadenoma.
  - Apoplexy has been reported in numerous diseases such as Sheehan's syndrome (pituitary infarction in post-partum women due to hypoperfusion) as well as pituitary macroadenoma.
- Clinical Presentation
  - Headache, vomiting, visual defects/ophthalmoplegia, panhypopituitarism, altered mental status. More common in men with mean age of 57.
    - The most common symptom is headache and is described as sudden, severe, retro-orbital headache
    - Enlargement of a pituitary macroadenoma can compress the optic chiasm and can cause bitemporal hemianopsia and effacement of the anterior 3rd ventricular recess.

Case Discussion

- Pathogenesis
  - Likely related to the excessive growth of a pre-existing adenoma that outgrows its blood supply
    - Pituitary becomes necrotic and hemorrhagic
    - Patient had a known acute Hgb drop, with retrospective retroperitoneal bleed. This created a vascular demand ischemia which led to hemorrhagic insult.
- Imaging
  - CT revealed a sellar mass with suprasellar extension. Patchy intralesional hyperdensity corresponds to blood products. Adjacent subarachnoid hemorrhage extends into right Sylvian fissure.
  - MRI revealed heterogenous T1 and T2 hyperintensity signal corresponding to acute/subacute blood products.
- Predisposing factors
  - Hypertension, diabetes, trauma, surgery, administration of estrogens and anticoagulants

Case Discussion

- Treatment
  - This patient had a macroadenoma and on follow-up head imaging, was shown to have subarachnoid hemorrhages within the right Sylvian fissure and suprasellar cistern. These findings, associated with the clinical presentation of worsening confusion and asymmetric pupils, are consistent with pituitary apoplexy.
  - Typical treatment plans are multidisciplinary and highly individualized
    - Pituitary Apoplexy Score (PAS) has been introduced to determine management
      - Takes into consideration neuroophthalmological parameters and Glasgow Coma Scale
    - Early transsphenoidal decompression if rapid deterioration
    - Conservative management: Hydrocortisone bolus for ophthalmoplegia or oral steroids, hormone replacement

References:

- Albani, A., Ferraù, F., Angileri, F. F., Esposito, F., Granata, F., Ferreri, F., & Cannavò, S. (2016). Multidisciplinary management of pituitary apoplexy. International Journal of Endocrinology, 2016, 1–11. https://doi.org/10.1155/2016/7951536.

- American College of Radiology. ACR Appropriateness Criteria®. Available at https://acsearch.acr.org/list . Accessed August 9, 2022.

- Boellis, A., di Napoli, A., Romano, A., & Bozzao, A. (2014). Pituitary apoplexy: An update on clinical and imaging features. Insights Imaging, 5(6), 753–762. https://doi.org/10.1007/s13244-014-0362-0.

- Herse, P. (2014). Pituitary macroadenoma: A case report and review. Clinical and Experimental Optometry, 97(2), 125–132. https://doi.org/10.1111/cxo.12099.

- Tosaka, M., Sato, N., Hirato, J., Fujimaki, H., Yamaguchi, R., Kohga, H., Hashimoto, K., Yamada, M., Mori, M., Saito, N., & Yoshimoto, Y. (2007). Assessment of hemorrhage in pituitary macroadenoma by T2*-weighted gradient-echo mr imaging. American Journal of Neuroradiology, 28(10), 2023–2029. https://doi.org/10.3174/ajnr.a0692.