Case 14708

Eurorad

Choroidal melanoma

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ISSN: 1563-4086
Section: Head & neck imaging
Area of Interest: Eyes
Procedure: Education
Imaging Technique: MR
Imaging Technique: PET-CT
Imaging Technique: CT
Special Focus: Pathology Case Type: Clinical Cases
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Figueroa, Ramon E. MD. FACR
Patient: 50 years, male

Clinical History:

A 43-year-old male patient presented to trauma services with loss of consciousness after being trampled by a horse. No focal neurological deficit was observed. Pupils were equal and reactive to light, with intact extraocular muscle movements. Fundoscopy, however, showed a subretinal mass in the left eye.
Imaging Findings:

Emergency room head CT without contrast was initially reported as a left globe superior temporal quadrant subretinal haemorrhage with intact scleral margins (Figure 1). Intracranial contents were normal. Fundoscopic examination by an ophthalmologist showed a subretinal mass prompting further investigation.
Orbital MRI with and without contrast showed a para-midline left globe superior temporal quadrant choroid layer lesion slightly T1 hyperintense prior to contrast injection and with homogeneous enhancement after. This favored the diagnosis of choroidal melanoma rather than haemorrhage (Figures 2 and 3).
PET CT showed no hypermetabolic lesion or systemic disease (Figure 4).
Biopsy for histopathology, however, confirmed the presence of a melanoma, which was treated with an intraocular radioactive brachytherapy plate.
Discussion:

The uvea is a highly vascular pigmented layer between the retina (inner) and sclera (outer), divided into the iris (anterior), ciliary body and choroid (posterior) (Figure 5).
Malignant uveal melanoma (MUM) is the most common primary tumour of the globe in adults [1]. MUM is most frequently seen in men around the age of 60. Risk factors include caucasians with fair skin and light iris color. Ultraviolet light has not been associated with MUM, except in certain occupations such as arc welders.
MUM arises from melanocytes within the uvea [2].
It is classified into anterior uveal if the tumour arises from the iris (3%), and posterior uveal when it originates from the choroid (90%) or ciliary body (7%) [3, 4]. For this reason MUM is frequently called "choroidal melanoma". Iris melanomas occur most frequently in the inferior quadrants (45%).
Ophthalmoscopic examination shows the typical appearance of a pigmented dome or mushroom-shaped mass. A, B and Doppler ultrasound modes are the most common diagnostic tests, which may diagnose >95% of cases. Additional tests include fluorescein angiography, optical coherence tomography, autofluorescence and Indocyanine green angiography, when needed.
CT identifies most MUM as hyperdense, elevated mushroom shaped choroidal lesions with post-contrast

enhancement.
MRI is the modality of choice for MUM mapping, since it is more sensitive and specific than ultrasound in detection of extra-ocular extension [3]. The tumour is characteristically hyperintense on T1 weighted images, high signal on FLAIR sequences and hypointense on T2 weighted images compared to the vitreous humor, due to the paramagnetic properties of melanin (short T1 and T2 relaxation times). MUM exhibits different patterns of enhancement which seem to correlate with the degree of malignancy and extraocular extension, being helpful to monitor response to therapy. Buerk et al. [5] identified three patterns of enhancement—0% to 20%, 20% to 50%, and >50%. More aggressive lesions showed stronger, rapid enhancement (>50%).
In the AJCC TNM staging for posterior uveal melanoma, T is classified based on tumour basal width and thickness and subdivided further to reflect ciliary body involvement and extra-scleral extension. 5-year survival is estimated to be 100% for patients with T1 tumours, 90.4% in T2 and 50% in T3, T3a or T4. FNAC /biopsy are definitive when a diagnosis cannot be established by clinical or imaging findings alone. Treatment includes brachytherapy, laser photocoagulation, photodynamic therapy, transpupillary thermotherapy (TTT), local tumor resection or even enucleation in cases of diffuse melanoma /extraocular extension.
Differential Diagnosis List: Malignant Uveal Melanoma,also known as Choroidal melanoma, Choroidal detachment, Choroidal nevus, Choroidal haemangioma, Uveal metastases, Amelanotic melanoma

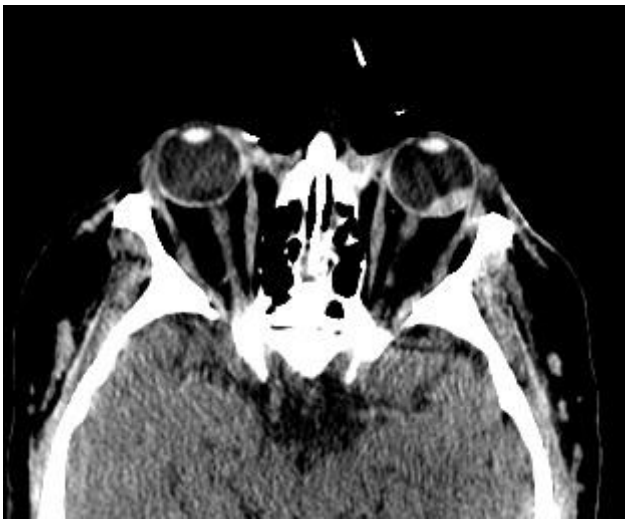
Final Diagnosis: Malignant Uveal Melanoma,also known as Choroidal melanoma

References:

Singh P, Singh A. (2012) Choroidal melanoma. Oman J Ophthalmol 5(1):3-9 (PMID: 22557869)
Tarlan B, K?ratl? H (2016) Uveal Melanoma: Current Trends in Diagnosis and Management. Turk J Ophthalmol 46(3):123-137 (PMID: 27800275)
Uduma FU, Titalom K. (2011) Intra-orbital malignant melanoma: role of MR imaging (a case report and literature review). Glob J Health Sci Dec 29;4(1):253-8 (PMID: 22980115)
Shields CL, Kaliki S, Furuta M, Mashayekhi A, Shields JA. (2012) Clinical spectrum and prognosis of uveal melanoma based on age at presentation in 8,033 cases. Retina Jul;32(7):1363-72. (PMID: 22466491)
Buerk BM, Pulido JS, Chiong I, Folberg R, Edward DP, Duffy MT, Thulborn KR. (2004) Vascular perfusion of choroidal melanoma by 3.0 tesla magnetic resonance imaging. Trans Am Ophthalmol Soc 2004;102:209-15 (PMID: 15747759)

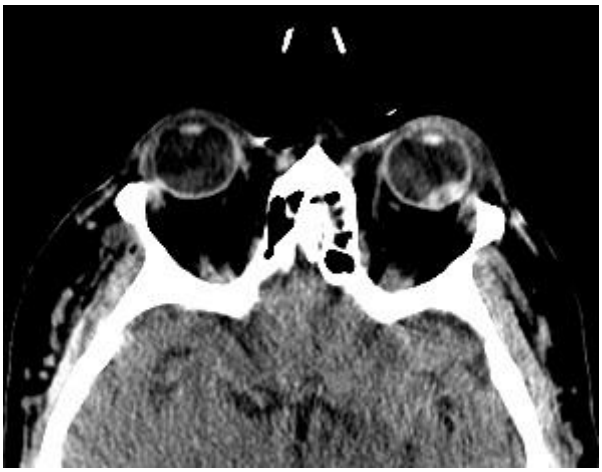
Figure 1

a



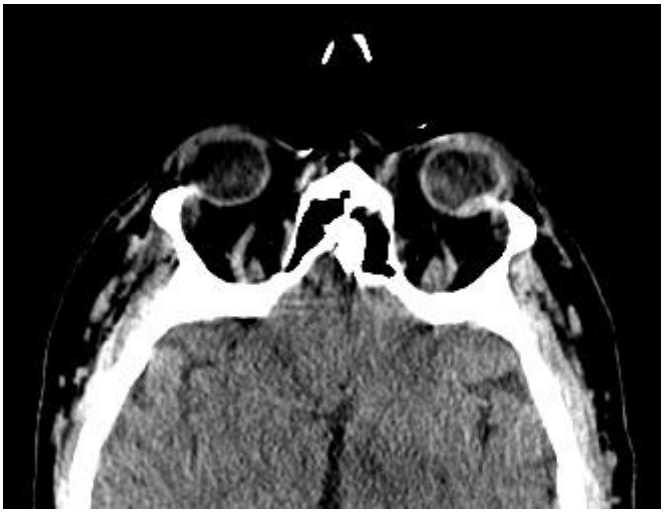
Description: Emergency room head CT without contrast reported a left temporal quadrant subretinal haemorrhage with intact left globe scleral margins.
Intracranial compartment was normal. **Origin:** Augusta University

b



Description: Emergency room head CT without contrast reported a left temporal quadrant subretinal haemorrhage with intact left globe scleral margins.
Intracranial compartment was normal. **Origin:** Augusta University

c



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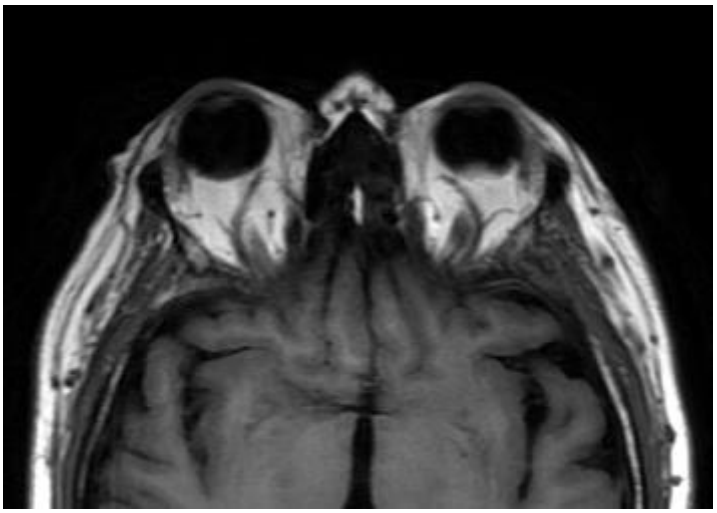
Intracranial compartment was normal. **Origin:** Augusta University

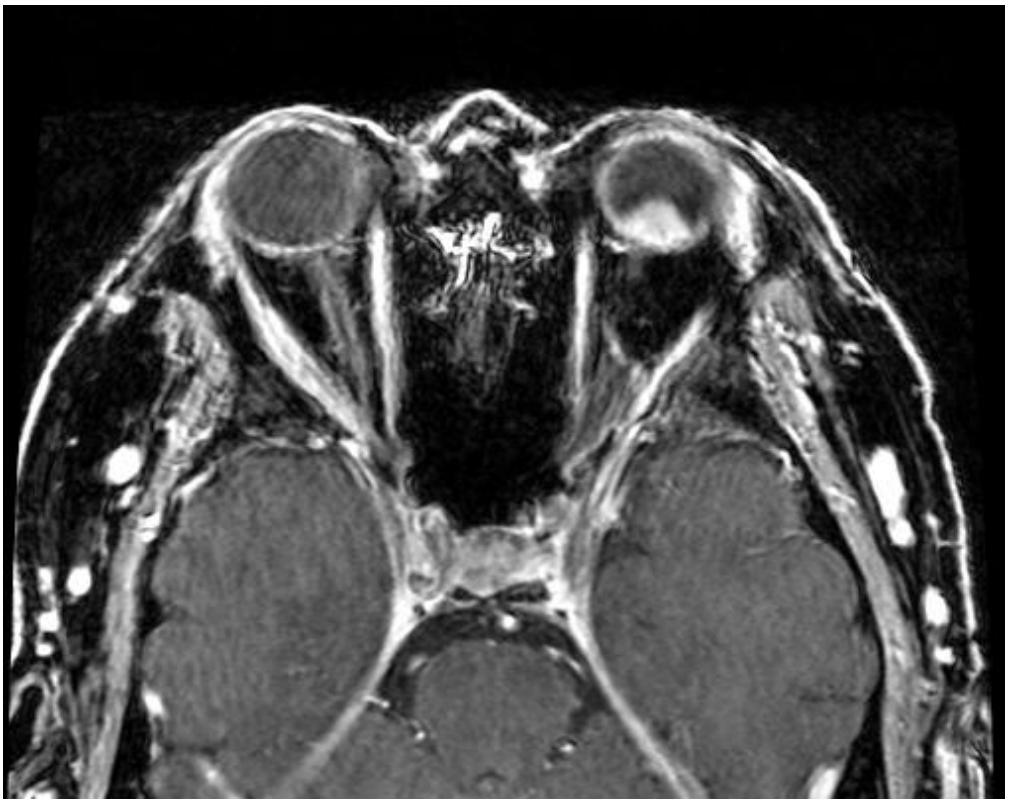
Figure 2

a



Description: There is a left globe superior nasal quadrant choroid layer T1 hyperintense lesion on axial T1 images without contrast. **Origin:** Augusta University

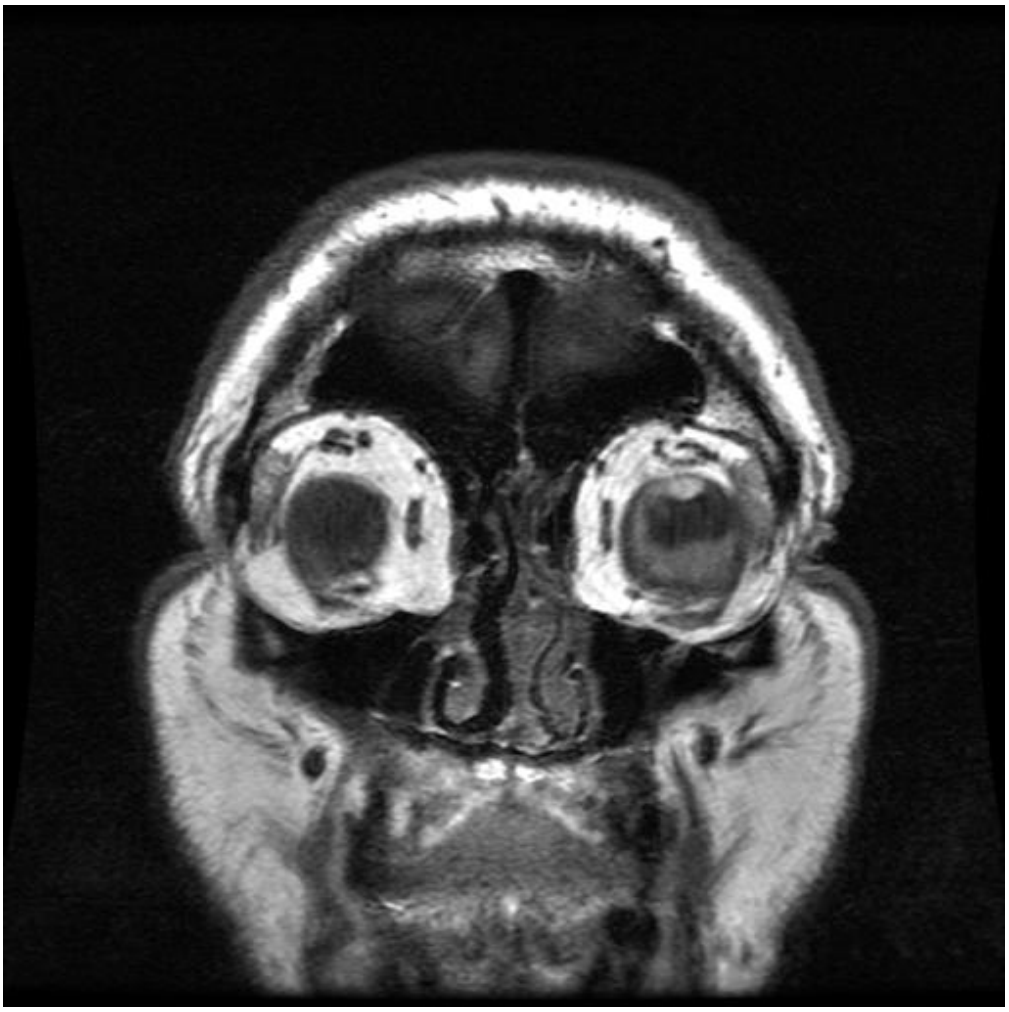
b



Description: Lesion shows further T1 hyperintensity from gadolinium enhancement on post contrast T1 axial images. **Origin:** Augusta University

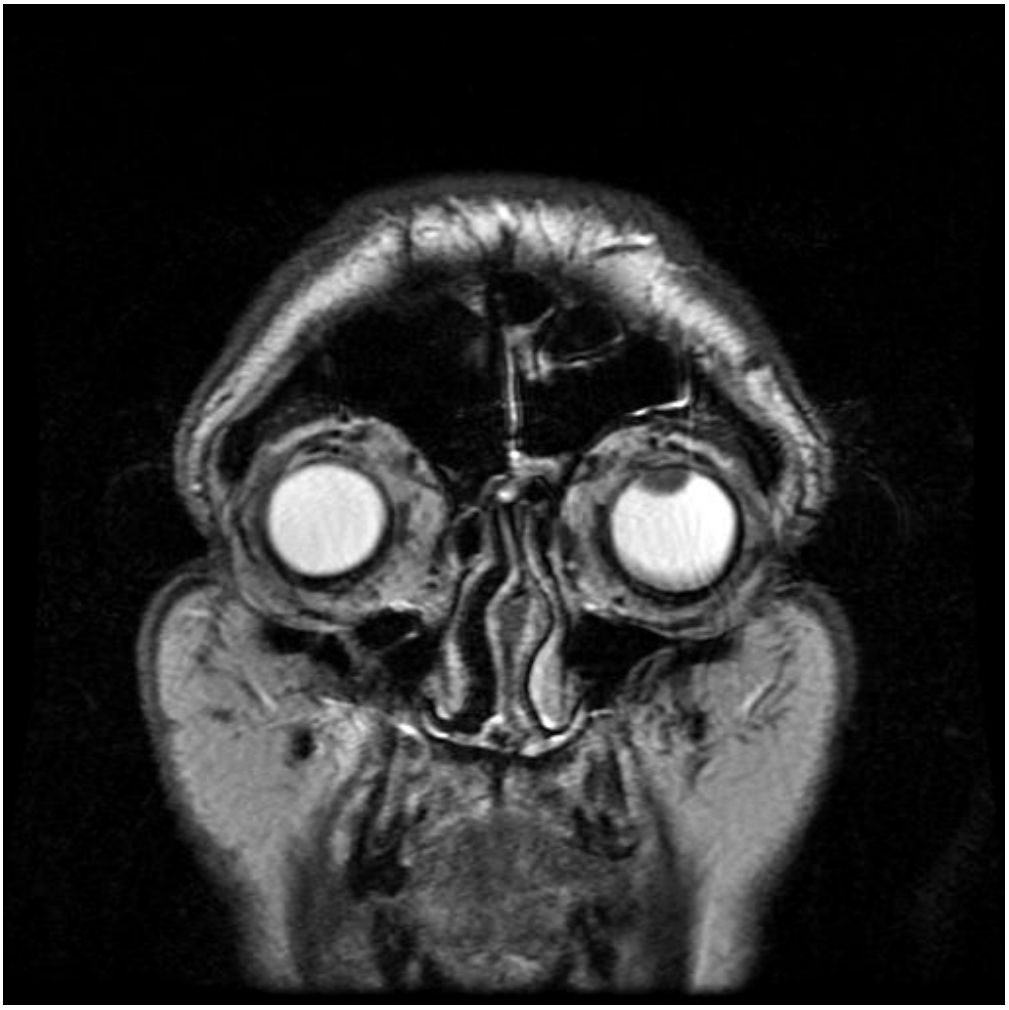
Figure 3

a



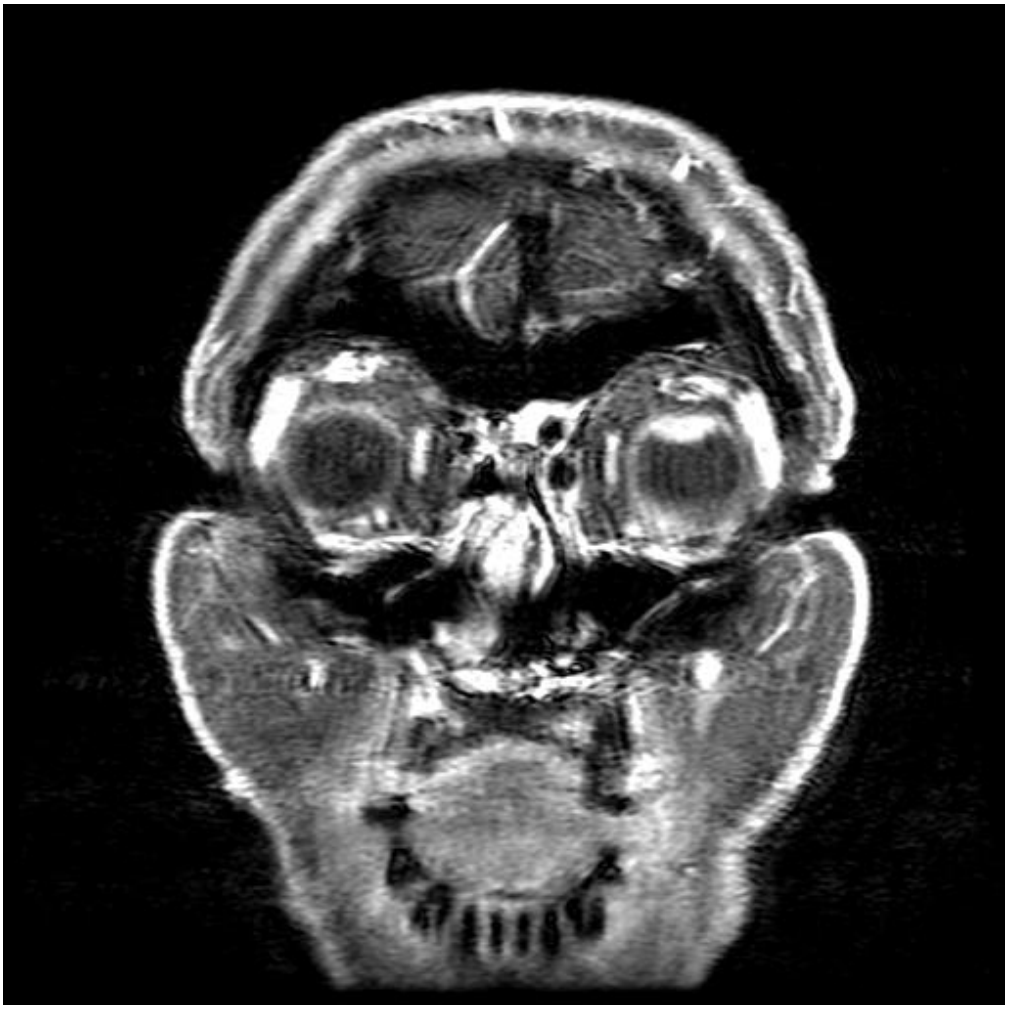
Description: Coronal T1 image prior to contrast shows hyperintense behavior of the left globe superior nasal quadrant choroid layer lesion. **Origin:** Augusta University

b



Description: Coronal T2 fat saturated image shows the lesion with hypointense behavior. **Origin:** Augusta University

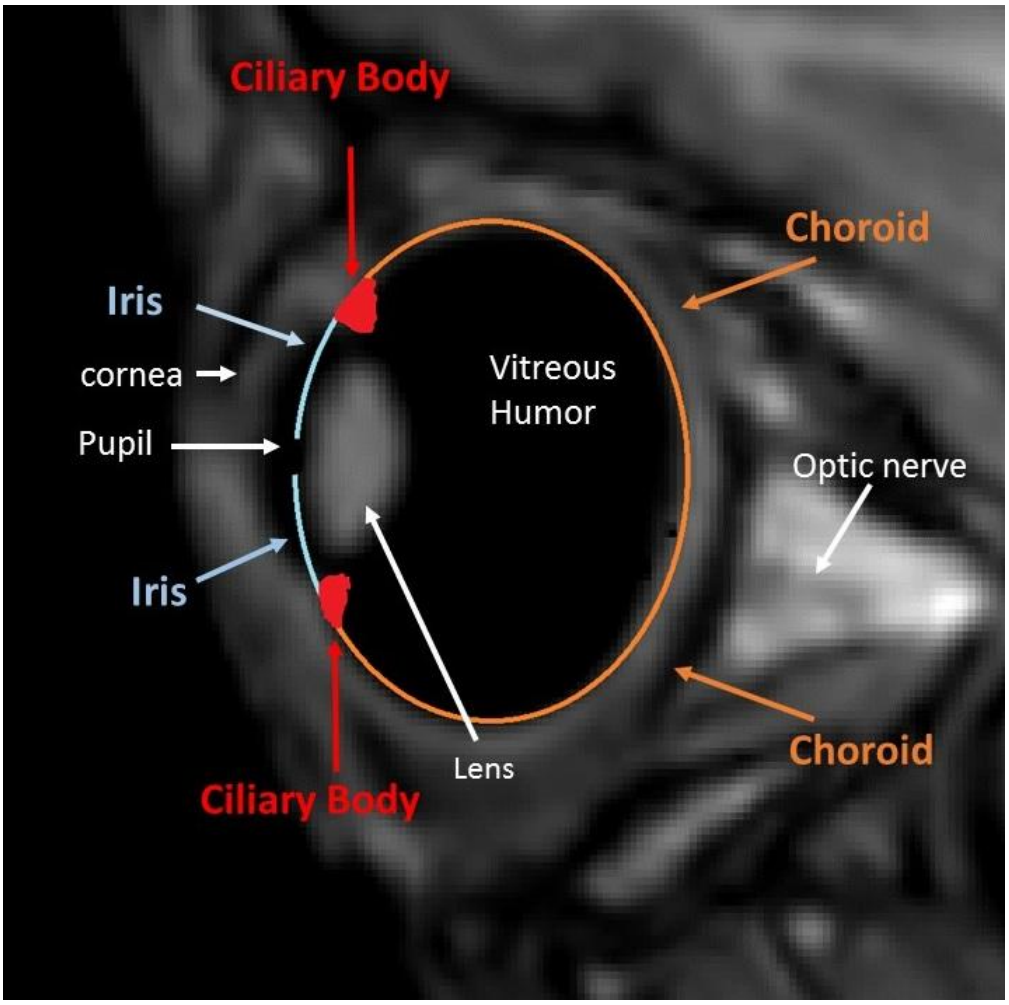
c



Description: Gadolinium enhanced coronal T1 image with fat saturation shows homogeneous lesion enhancement. **Origin:** Augusta University

Figure 4

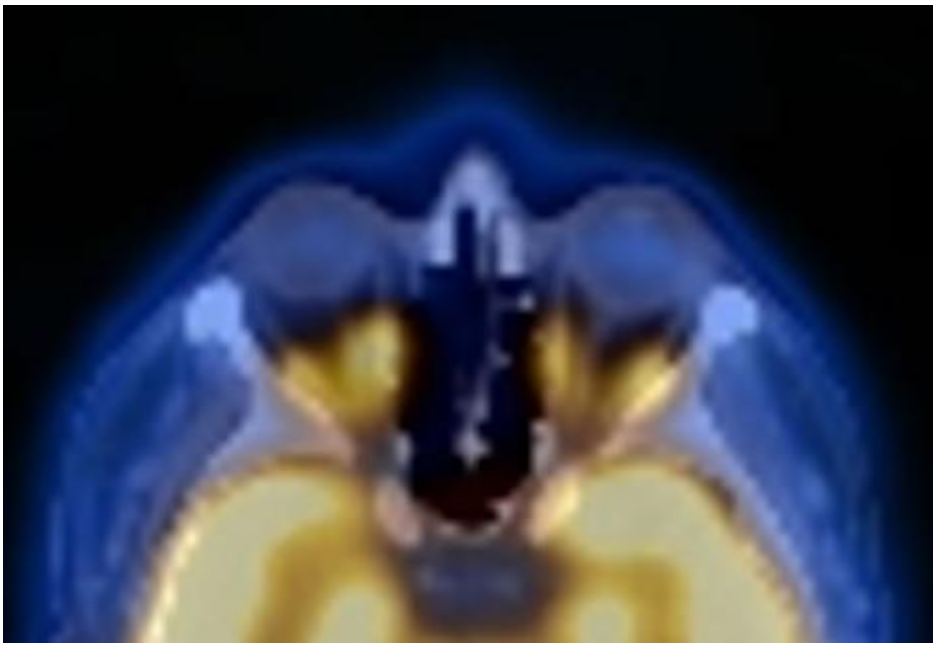
a



Description: Pertinent globe anatomy of the uveal tract: iris (blue arrows), ciliary body (red arrows) and choroid layer (orange arrows). **Origin:** Donato, Angel MD. Neuroradiology,Augusta University, Augusta Georgia, USA.

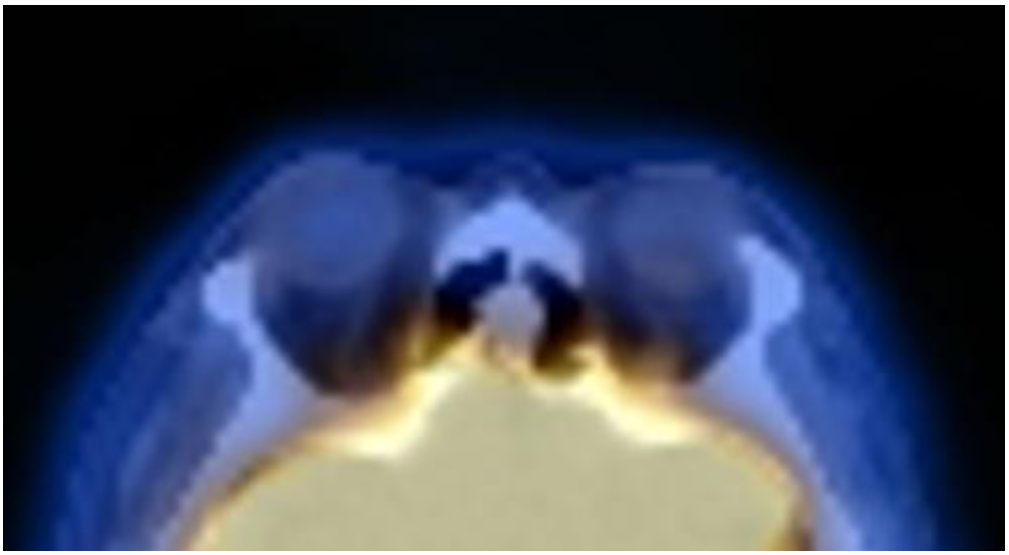
Figure 5

a



Description: PET CT obtained for disease spread assessment shows the left globe subtle anatomic lesion with no hypermetabolic behavior. No systemic disease was detected. **Origin:** Augusta University

b



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