

AMSER Case of the Month

65 year old with worsening headaches with past medical history of recurring meningiomas



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Patient Presentation

- Worsening headaches for last few months. Slight difficulty with concentration. No vision changes or any other focal neuro defects.
- **Past Medical History**: recurrent meningiomas, seizures, hypertension
- **Past Surgical History**: 3 craniotomies, 1 craniectomy
- **Meds**: Celecoxib, levetiracetam, valsartan
- **Family History**: non-significant
- **Social History**: non-significant
- **Physical Exam**: cranial nerves intact, no focal neurological defects

Pertinent Labs

- **CMP/CBC**: within normal limits (wnl)
- **TSH**: wnl
- **BMP**: wnl
- **HCG**: negative

What Imaging Should We Order?

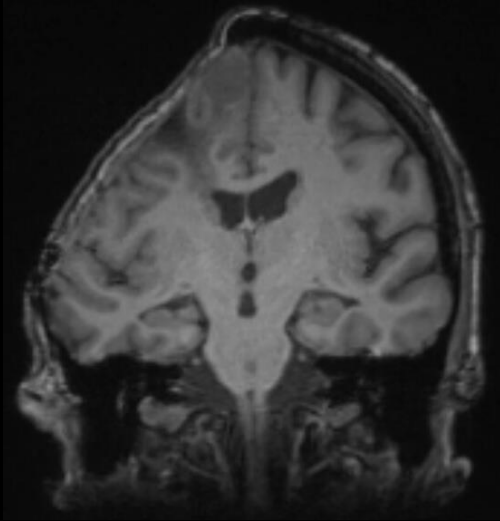
Select the applicable ACR Appropriateness Criteria

Variant 7:

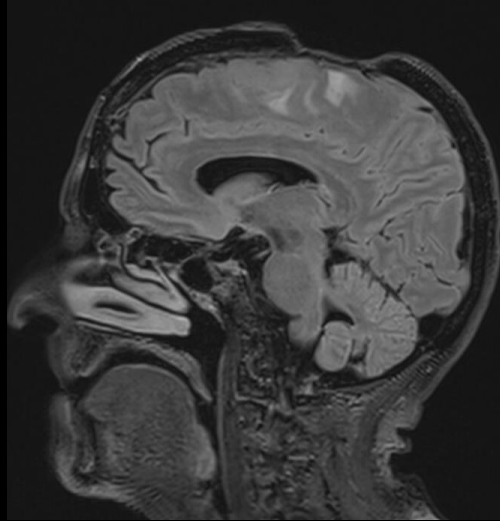
Headache with one or more of the following “red flags”: increasing frequency or severity, fever or neurologic deficit, history of cancer or immunocompromise, older age (>50 years) of onset, or posttraumatic onset. Initial imaging.

Procedure	Appropriateness Category	Relative Radiation Level
MRI head without and with IV contrast	Usually Appropriate	0
MRI head without IV contrast	Usually Appropriate	0
CT head without IV contrast	Usually Appropriate	☼☼☼
Arteriography cervicocerebral	Usually Not Appropriate	☼☼☼
MRA head with IV contrast	Usually Not Appropriate	0
MRA head without and with IV contrast	Usually Not Appropriate	0
MRA head without IV contrast	Usually Not Appropriate	0
MRI head with IV contrast	Usually Not Appropriate	0
MRV head with IV contrast	Usually Not Appropriate	0
MRV head without and with IV contrast	Usually Not Appropriate	0
MRV head without IV contrast	Usually Not Appropriate	0
CT head with IV contrast	Usually Not Appropriate	☼☼☼
CT head without and with IV contrast	Usually Not Appropriate	☼☼☼
CTA head with IV contrast	Usually Not Appropriate	☼☼☼
CTV head with IV contrast	Usually Not Appropriate	☼☼☼

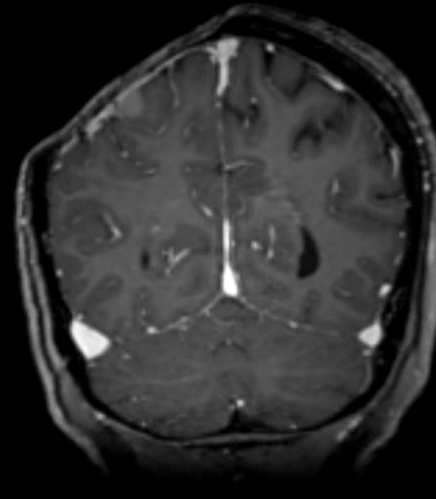
Findings (unlabeled)



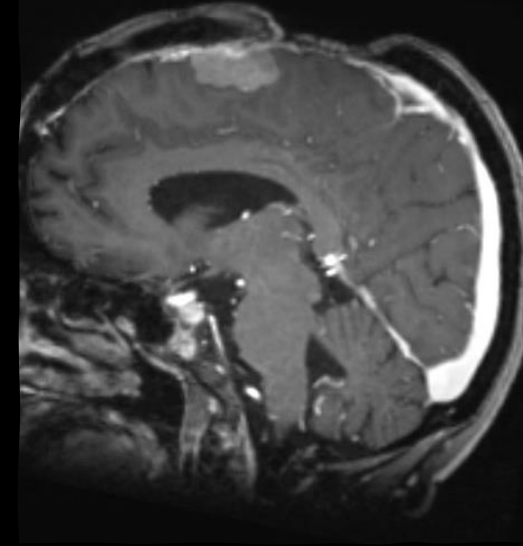
Axial T1 MRI pre contrast



Sagittal FLAIR



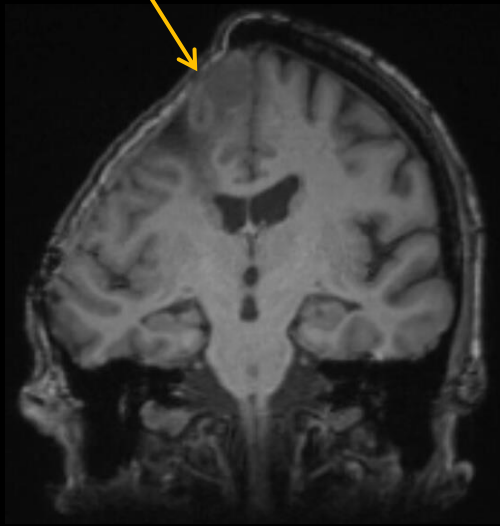
Coronal T1 MRI post contrast



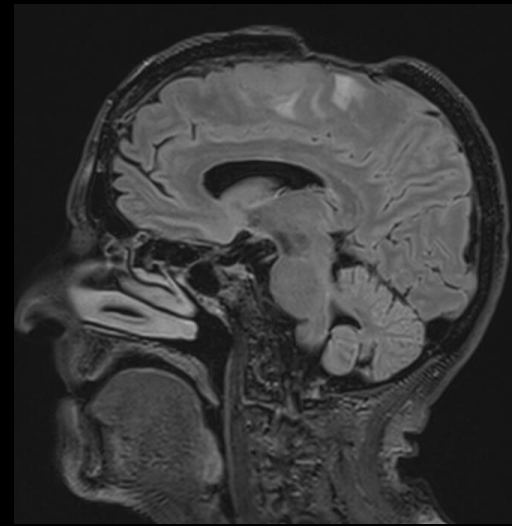
Sagittal T1 MRI post contrast

Findings (labeled)

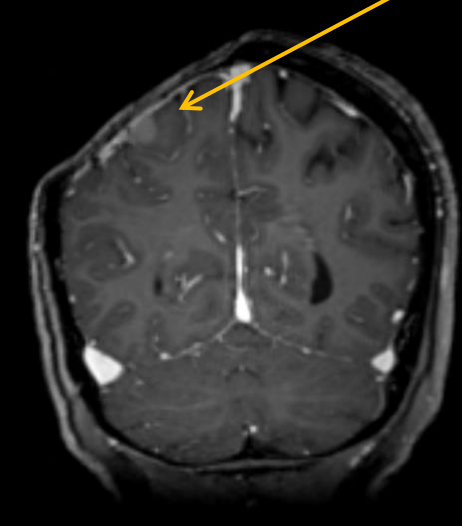
Hypointense extra-axial mass



Axial T1 MRI pre contrast

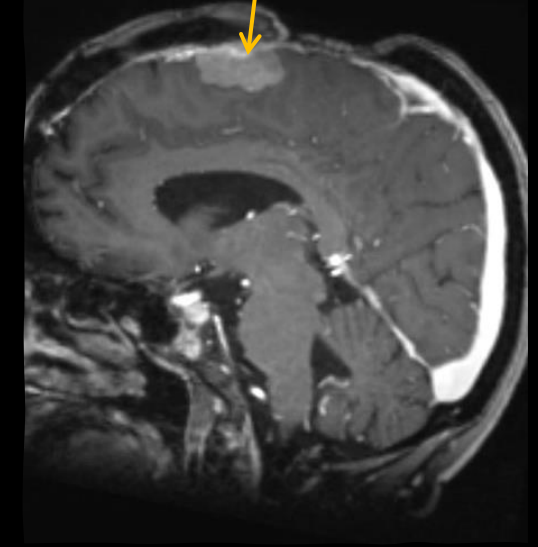


Sagittal FLAIR



Coronal T1 MRI post contrast

Enhancing extra-axial mass along right frontal convexity



Sagittal T1 MRI post contrast

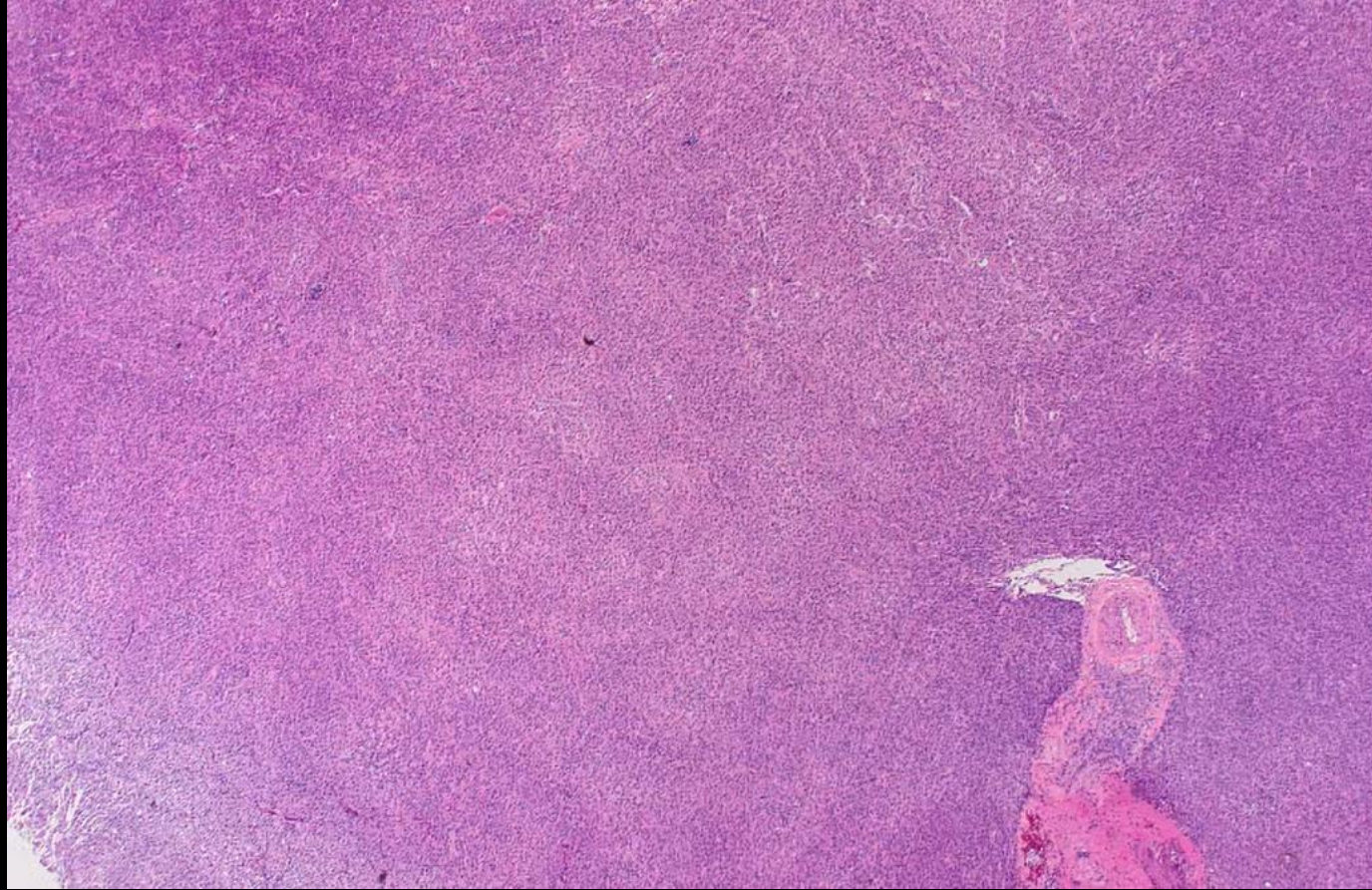
Differential Diagnosis

- Metastasis
- Lymphoma
- Meningioma

Gross specimen

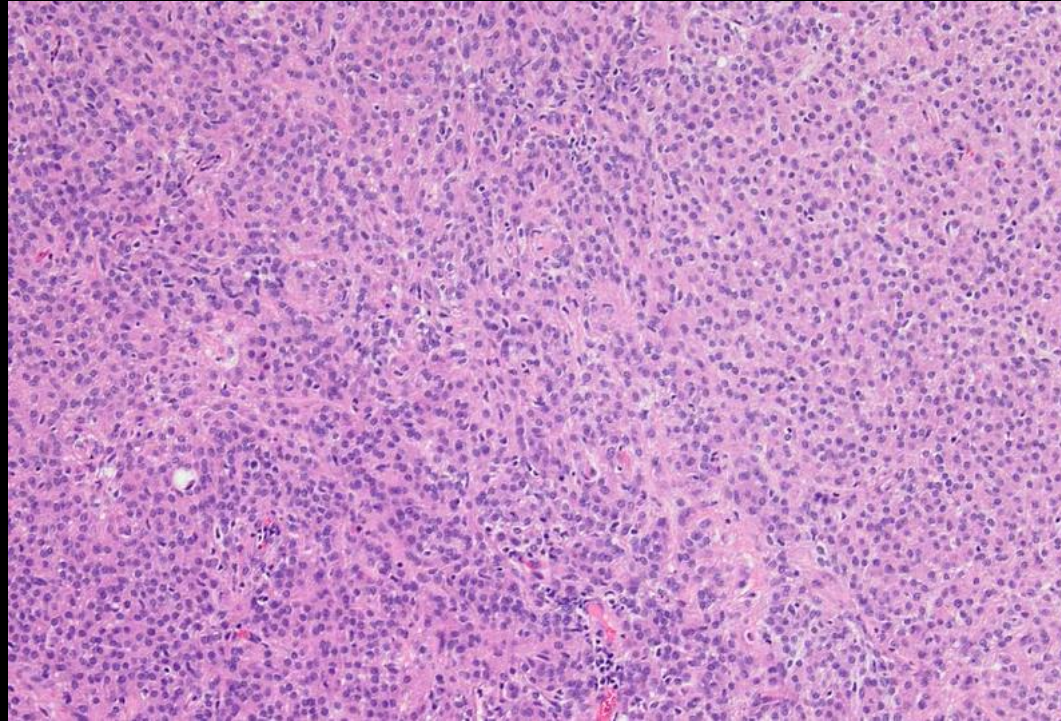


Pathology



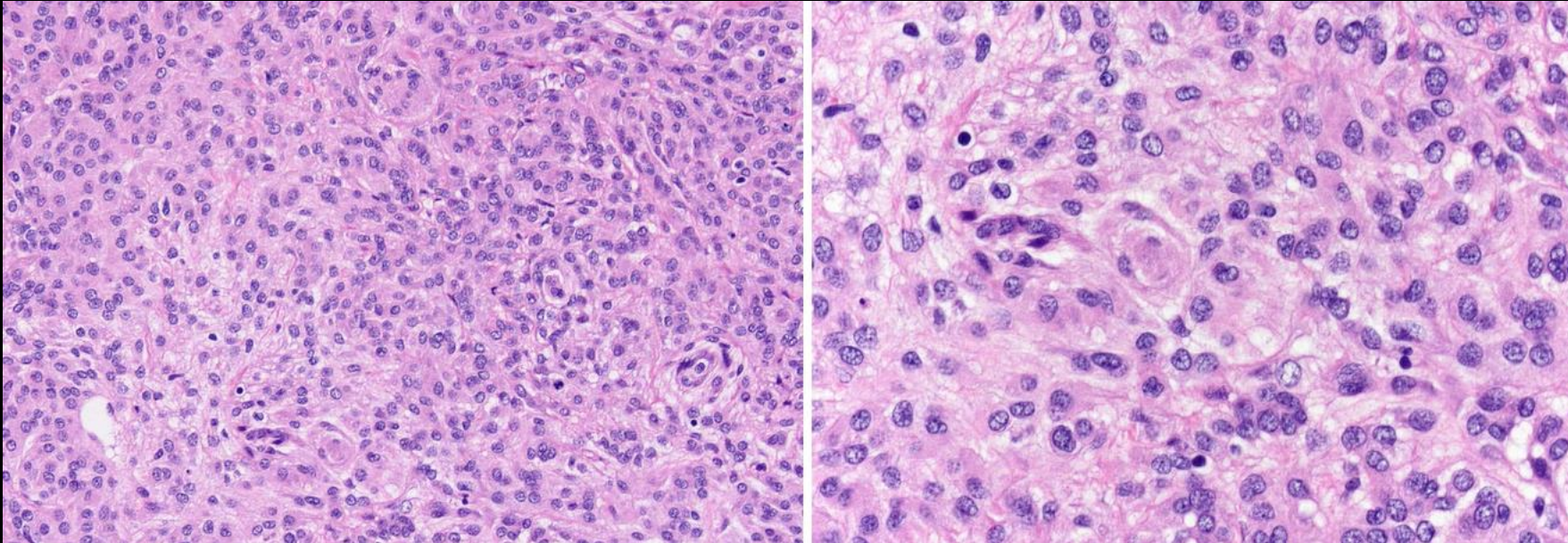
Low power: Sheet-like architecture of the epithelioid cells

Pathology



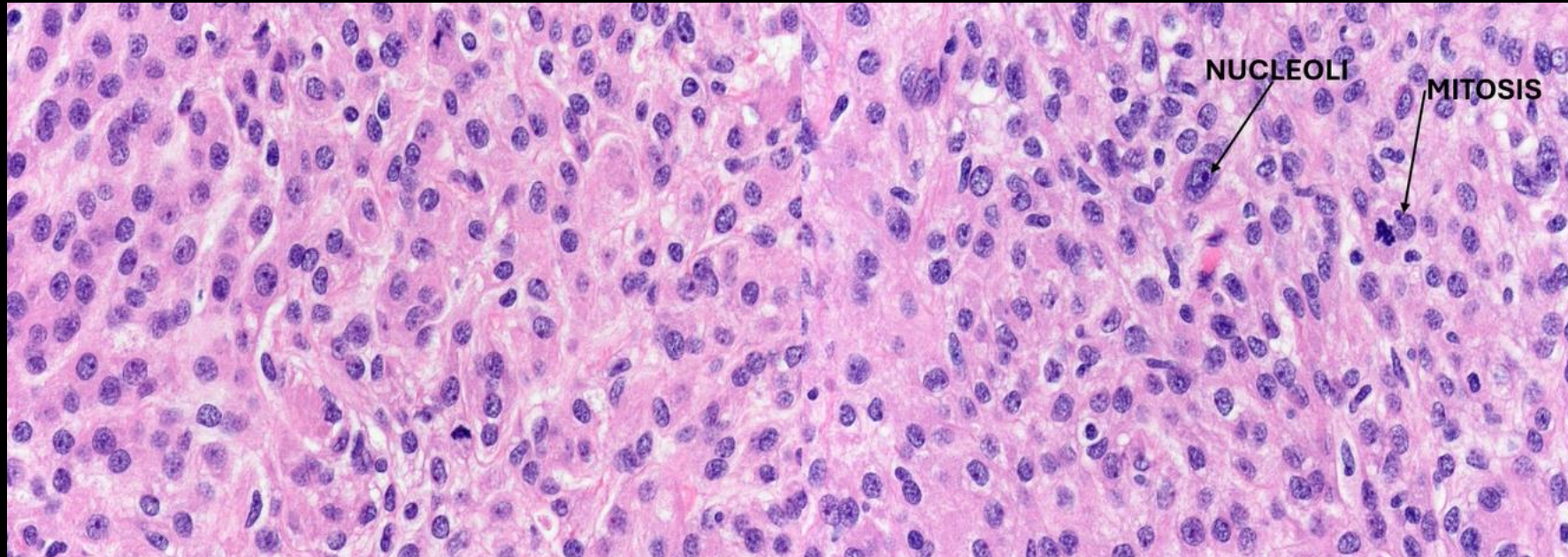
Low power: Sheet-like architecture of the epithelioid cells with round to oval blue nuclei and eosinophilic cytoplasm

Pathology



Medium power: Epithelioid cells with round to oval nuclei with vesicular chromatin and prominent nucleoli

Pathology



High power: Epithelioid cells with round to oval nuclei with vesicular chromatin and prominent nucleoli. There is increased mitosis

Final Dx:

Grade 2 Meningioma

Case Discussion

- Extra-axial mass often with broad dural base (“dural tail sign” on MRI post-contrast) [1]
- Hyperdense on non-contrast CT
- Iso- to hypointense on T1, iso- to hyperintense on T2 MRI
- Strong homogeneous enhancement with gadolinium
- May cause hyperostosis or adjacent bone remodeling
- Can cause mass effect with edema, but often no invasion of brain parenchyma [2]

Case Discussion

- Derived from arachnoid cap cells
- Most are WHO Grade I (benign), but can be Grade II (atypical) or III (anaplastic)
- Whorled pattern and psammoma bodies are classic histologic findings
- EMA positive, may also stain for vimentin
- NF2 gene mutation often seen, especially in multiple or spinal lesions
- More common in females, often progesterone receptor positive [3]

Case Discussion

- Observation for small, asymptomatic lesions
- Surgical resection is primary treatment (Simpson grading for extent of resection)
- Radiotherapy or stereotactic radiosurgery for non-resectable, recurrent, or atypical/anaplastic tumors [4]

References:

1. Kunimatsu A, Kunimatsu N, Kamiya K, Katsura M, Mori H, Ohtomo K. Variants of meningiomas: a review of imaging findings and clinical features. *Japanese Journal of Radiology*. 2016; 34(7): p.459-469. doi: 10.1007/s11604-016-0550-6
2. Watts J, Box G, Galvin A, Brotchie P, Trost N, Sutherland T. Magnetic resonance imaging of meningiomas: a pictorial review.. *Insights Imaging*. 2014; 5(1): p.113-22. doi: 10.1007/s13244-013-0302-4Open in Read by QxMD
3. Buerki RA, Horbinski CM, Kruser T, Horowitz PM, James CD, Lukas RV. An overview of meningiomas. *Future Oncology*. 2018; 14(21): p.2161-2177. doi: 10.2217/fon-2018-0006Open in Read by QxMD
4. Buerki RA, Horbinski CM, Kruser T, Horowitz PM, James CD, Lukas RV. An overview of meningiomas. *Future Oncology*. 2018; 14(21): p.2161-2177. doi: 10.2217/fon-2018-0006Open in Read by QxMD