ORIGINAL RESEARCH PAPER

Radio-Diagnosis

SPHENO-ORBITAL MENINGIOMA (PSAMMOMATOUS HISTOLOGICAL SUBTYPE): A CASE REPORT

KEY WORDS: Spheno-orbital meningioma, Psammomatous, Orbit, Proptosis, Optic nerve, Sphenoid wing, cavernous sinus

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ABSTRACT

Spheno-orbital meningioma is an uncommon, but important subtype of intracranial meningiomas. Spheno-orbital meningioma arises from the sphenoid wing and extent into the orbit. Spheno-orbital meningioma present with classic symptomatic triad proptosis, visual deficient and ocular paresis. These meningiomas comprise 15-20% of all intracranial meningiomas and although they tend to have a benign histopathology, their location and growth pattern invading the cranial nerve foramina and the intraorbital compartment present unique surgical challenges. Here we present a case of Spheno-orbital meningioma in 24-year-old male patient.

INTRODUCTION

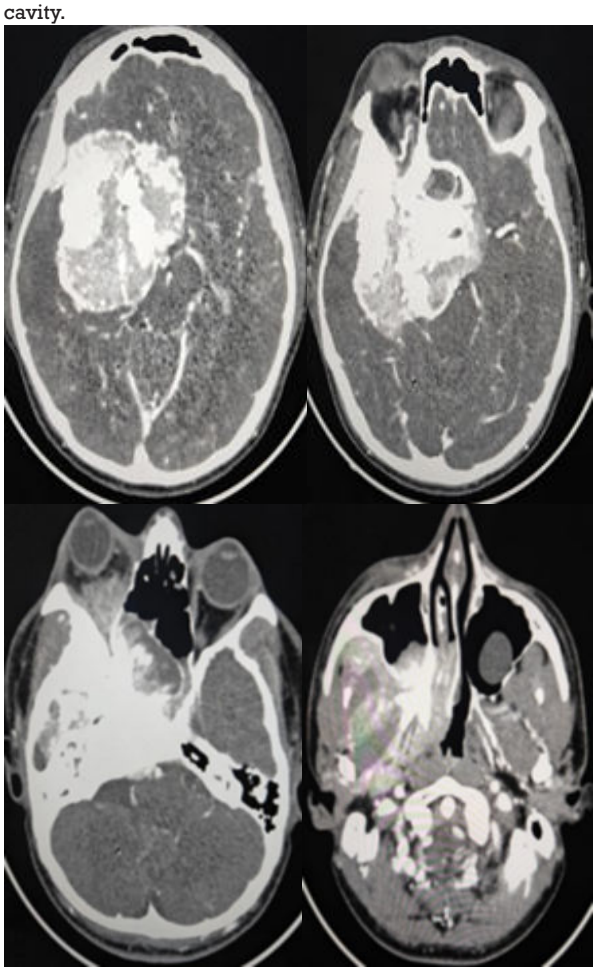
Meningioma is by far the most common extra-axial tumor. It arises from meningothelial arachnoid "cap" cells. Most common benign primary intracranial tumor in adults and the most common cause of a solitary dural mass. The vast majority 80-85% are benign (WHO grade 1), but 4% are atypical (grade 2) and 1-2% are anaplastic or malignant (grade 3). Meningioma classically occurs in elderly adults with a female predominance with > 90% are solitary and most often asymptomatic. Peak occurrences mean age 65 years. Ihe main acquired risk factor is ionizing radiation exposure. Multiple meningioma is common with NF2 and non-NF2 hereditary multiple meningioma syndrome. Meningioma can occur anywhere in the neuraxis. But most commonly supratentorial (90%) along parasagittal (25%), convexities (20%) and along skull base (e.g., sphenoid ridge (15-20%), olfactory groove, planum sphenoidale, tuberculum sellae). Less common posterior fossa (8-10%) and parasellar (5-10%). Rare (2%) include intra ventricular, pineal region, extracranial (optic nerve sheath, sinus and nose) and intraosseous.

CASE REPORT

A 24-year male patient presented to Neurosurgery Department of the GCRI Hospital (Gujarat cancer and research institute) with complaint of right-side proptosis followed by ocular paresis and right side visual deficient. The patient was initially presented in a private hospital for same where MRI Brain Angiogram with PNS screening done. Overall radiological data suggest osteosarcoma of sphenoid bone and referred to GCRI Hospital (Gujarat cancer and research institute) for the same.

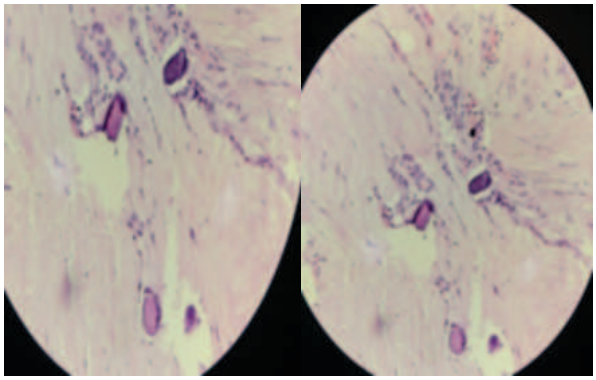
IMAGING FINDINGS

By this presentation neurosurgeon prescribed in GCRI Hospital (Gujarat cancer and research institute) CT Brain Angiogram. Patient was taken for CT Brain Angiogram for conformation of disease and extent of same. CT Brain Angiogram reveals approx. 8x8x9 cm sized large lobulated enhancing soft tissue density lesion arising from right side body, greater and lesser wing of sphenoid bone. Lesion shows multiple areas of calcifications/sclerosis predominantly noted along the periphery. Lesion extent intraconal as well as extraconal aspect of right eye with encasement of optic nerve, medial and inferior rectus muscle resultant proptosis on right side, medially lesion shows involvement of right sphenoid sinus and cavernous sinus with encasement of entire intracranial right ICA, M1 segment of right MCA and A1 segment of right ACA. Lesion also involves sella with pituitary gland with extension into supra sellar cistern causing compression over optic chiasma with encasement of right optic nerve. Lesion involves the left cavernous sinus with encasement of cavernous-supraclinoid- communicating segments of left ICA. Posterolateral compression over right temporal lobe resultant oedema of right temporal lobe with mass effect in form of midline shift and compression over right lateral and third ventricle. Lesion shows extension in crural and prepontine cistern with moderate compression over cerebral peduncle and pons on right side. The lesion predominately supplies from middle meningeal artery with part of supply also seen from artery of pterygoid canal. Lesion involves clivus bone and right petrous apex. Inferiorly involved right side nasopharyngeal mucosa, Antero inferiorly lesion shows extension in posterior aspect of right nasal cavity.



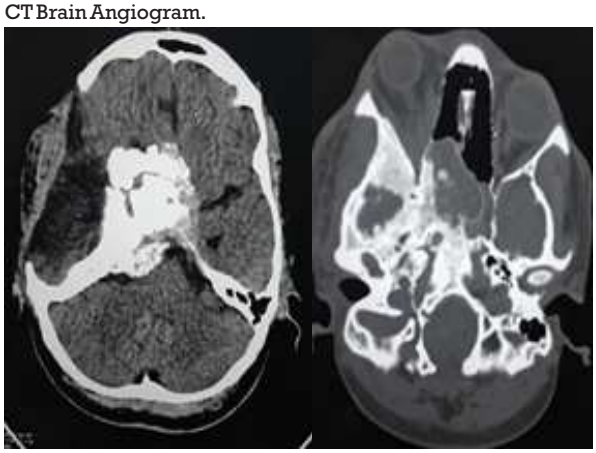
Previous Radiological Data Suggest Differential Diagnosis:

(1) osteosarcoma (2) chondrosarcoma and (3) atypical meningioma was considered. Surgery was performed with a right fronto-parietal craniotomy and the tumor was removed and tissue was sent for intraoperative frozen section for histopathological examination. The morphological and immunohistochemical data were consistent with psammomatous meningioma (Grade I) according to WHO classification.



Post Surgery NCCT Brain Was Done:

NCCT Brain shows residual lesion when compared to pre op CT Brain Angiogram.



DISCUSSION

Spheno-orbital meningioma originates from dura of sphenoid wing and secondary infiltrates the orbital compartment. Studies have found that female predominance is greater in Spheno-orbital meningioma than in meningioma of other locations. These tumors are complex and slow growing, and they are characteristically distinct from sphenoid wing meningiomas in part because they have both intraosseous and orbital/periorbital component. These tumors often invade important neurovascular structures around the orbital apex, superior orbital fissure and cavernous sinus. Aggressive tumor removal could achieve acceptable control; however, residual tumor can regrow.

Some typical radiological imaging finding of meningioma.

Meningioma have a broad dural base; most often round (globose) occasionally en plaque (sheet-like). On NCCT, meningioma is usually hyperattenuating relative to brain and approximately 25% calcify. On CECT > 90% of meningioma enhance strongly and uniformly. MRI appearance can be variable with iso-or slightly hypointense signal on T1-weighted images and variable signal intensity on T2-weighted images. CSF-vascular "cleft" is especially well delineated on T2WI and is seen as hyperintense rim interposed between the tumor and brain. Meningioma Avidly enhances post contrast images. An enhancing dural tail is thought to be due to vasoactive substance released by meningioma rather than the tumor spread to the dura. On conventional angiography meningioma shows mother-in-law sign. Despite the extra-axial location of most meningiomas, there may be extensive white matter edema. The adjacent bone may show reactive hyperostotic changes or even intraosseous/trans osseous extension, mimicking fibrous dysplasia or an osteoblastic malignancy. Bone involvement by meningioma occurs with both benign and malignant meningioma and is not predictive of tumor grade.

CONCLUSION

Spheno-orbital meningiomas are usually slow- growing skull base tumors revealed by proptosis or visual impairment. They typically present with significant tumoral spheno-orbital hyperostosis and a globoid or en plague intradural portion. As their epicenter is located at the level of the lesser and greater sphenoid wings, they progressively extent to the temporal and infratemporal fossae, orbit, anterior clinoid process, cavernous sinus, compromising the integrity of the optic canal, the superior orbital fissure, and the cranial nerve passing through. The reference treatment is currently optimal surgical resection after complete ophthalmological examination and radiological evaluation by MRI and CT scan. Although risk of recurrence appears to clearly correlate with the quality of the surgical resection, in cases with excessive meningioma adherence to critical anatomical structures, the removal of the tumor must be restricted in order to limit the comorbidities related to induce cranial nerves deficits. Radiation therapy is a safe option after surgery for recurrent or aggressive meningiomas.

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