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Imaging Findings of Esthesioneuroblastoma

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Clinical History

CLINICAL HISTORY

A 28 year female presented to hospital with chief complaints of nasal stuffiness, epistaxis and headache since 5 months.

Imaging Findings

Patient subsequently underwent CEMRI BRAIN with PNS to look for the underlying etiology.

MR Imaging revealed an ill-defined T2 iso to hyperintense lobulated solid cystic mass lesion extending from posterior nasal cavity into anterior cranial fossa through bilateral posterior ethmoidal air cells and sphenoid sinus to involve bilateral frontal lobes with significant perilesional edema. On T1 images, it showed iso to hypointense signal. DWI showed mild diffusion restriction within the solid component of the mass. On postcontrast images, the mass showed heterogenous enhancement.

Imaging findings were suggestive of esthesioneuroblastoma with intracranial extension. Patient underwent surgical resection of the entire tumour. Histopathological examination from the post operative specimen confirmed it as esthesioneuroblastoma (olfactory neuroblastoma).

DISCUSSION

A. Olfactory neuroblastoma or esthesioneuroblastoma is a rare malignant neoplasm arising from the superior nasal cavity's olfactory epithelium with a incidence of ~0.4 per million[1, 2].

B. Patients usually present with nasal obstruction, epistaxis. Head ache ,hyposmia or anosmia are other associated symptoms[3, 4].As the esthesioneuroblastoma symptoms are non-specific in early stages ,usually there is delay in diagnosis with a median interval of 6 to 12 months between the onset of symptoms and diagnosis [5–8]**.** Patients survival depends upon the stage at the intial presentation, so accurate staging must be done at initial presentation. To know the extent of the disease, appropriate imaging evaluation includes both a CT and an MRI [9].

C. CT helps in assessing bony destruction, in cases of esthesioneuroblastoma erosion of cribriform plate, lamina papyracea and fovea ethmoidalis are commonly noted. MRI is better at evaluating extent of tumour into surrounding soft tissues and intracranial extension, it also helps in differentiating tumour from mucus [10, 11]. CT on bone window shows expansile bony remodelling with bone destruction usually of the cribriform plate. Esthesioneuroblastoma is hypo to isointense on T1WI and iso to hyperintense on T2WI in relative to grey matter of brain. Areas of cystic degeneration and haemorrhage are common. The presence of intracranial cysts strongly suggests esthesioneuroblastoma but it is not diagnostic. On post contrast images, it shows avid and homogenous enhancement. Tumour may show orbital and intracranial extension [12-14]. Neck metastasis are found in nearly 5 % of esthesioneuroblastoma, so imaging of neck must be included in work up of these patients [9]. The modified kadish staging is done to predict the survival of patients with esthesioneuroblastoma. According to modified kadish staging, four stages were determined. In stage A ,tumour is limited to nasal cavity, In stage B tumour is limited to nasal cavity and paranasal sinuses, In stage C tumour, tumour extends beyond nose and PNS to involve cribriform plate, base of skull ,orbit or

intracranial cavity. Tumour with metastasis to cervical nodes is categorized under stage D [2-16].

Treatment of esthesioneuroblastoma depends upon the tumour extension and histological grade. Multimodality treatment offers the best cure in most of the cases. Surgery followed by radiation therapy is the best therapy as reported in literature [17, 18]. The prognosis of esthesioneuroblastoma depends on stage and histological grade of tumour. 5 year survival rate for low grade tumours is around 80% and for high grade tumours is nearly 25% [18].

Final Diagnosis
Esthesioneuroblastoma
Differential Diagnosis List

1. Sinonasal squamous cell carcinoma: epicentered in maxillary antrum and does not show intense enhancement.
2. Sinonasal adenocarcinoma: History of wood dust exposure. No T2 hyperintense cysts within the mass.
3. Sinonasal melanoma: Lower nasal cavity is the most common site. T1 hyperintense and t2 hypointense mass.
4. Sinonasal non Hodgkin lymphoma: Hyperdense on NCCT images, shows diffusion restriction on DWI. Rarely extends into anterior cranial fossa.

FIGURES

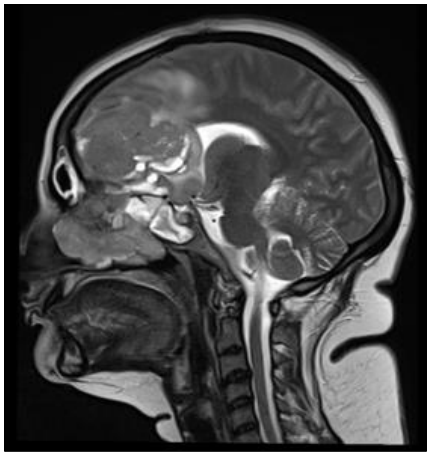

Fig 1a: Axial T2 weighted image – An ill-defined iso to hyperintense lobulated solid cystic mass lesion extending from posterior nasal cavity into anterior cranial fossa through bilateral posterior ethmoidal air cells and sphenoid sinus to involve bilateral frontal lobes with significant perilesional edema.

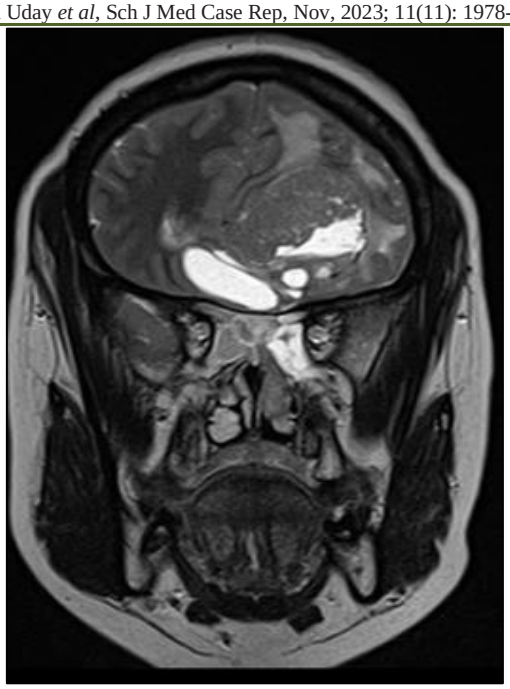

Fig 1b: Coronal T2 weighted image- An ill-defined iso to hyperintense lobulated solid cystic mass lesion extending from posterior nasal cavity into anterior cranial fossa through bilateral posterior ethmoidal air cells and sphenoid sinus to involve bilateral frontal lobes with significant perilesional edema.

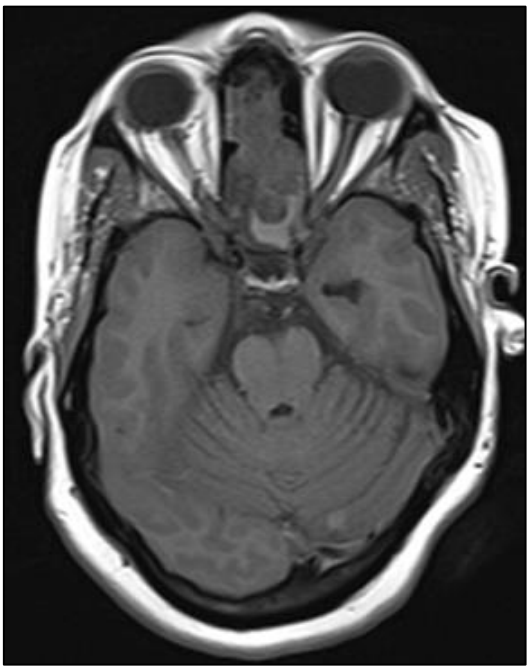

Fig 2a: Precontrast axial T1 image - Iso to hypointense mass with ill defined margins in posterior ethmoidal air cells .

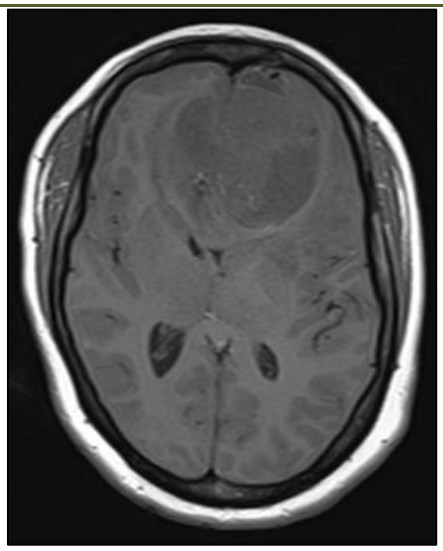

Fig 2b: Precontrast axial T1 image - Iso to hypointense mass with ill defined margins extending from posterior ethmoidal cells into bilateral frontal lobes.

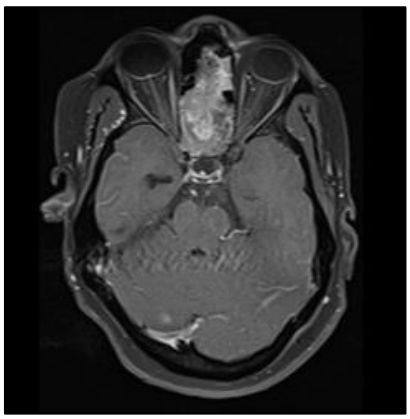

Fig 2c: Postcontrast axial T1 image - Heterogenous enhancement of the solid component of the mass within the posterior ethmoid air cells.

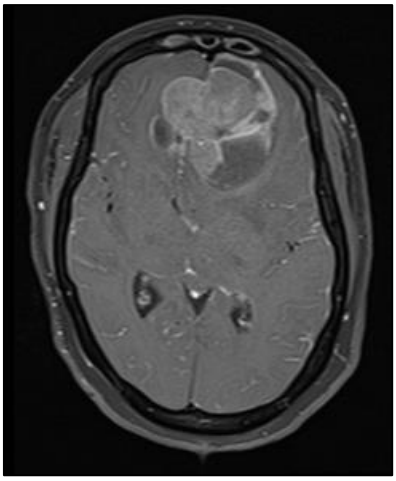

Fig 2d: Postcontrast axial T1 image - Heterogenous enhancement of solid component of the mass within the bilateral frontal lobes

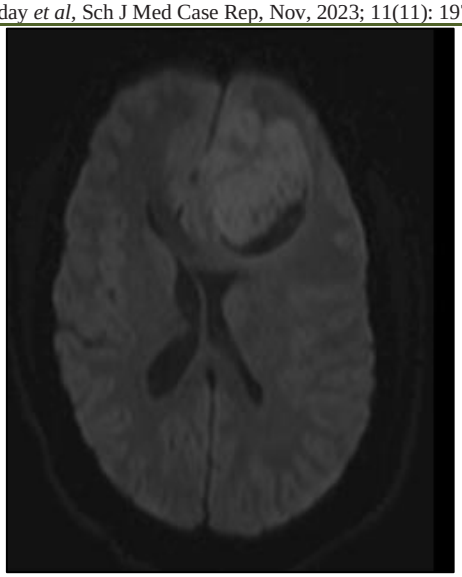

Fig 3a: DWI - Hyperintense signal within the solid component of the mass in bilateral frontal lobes.

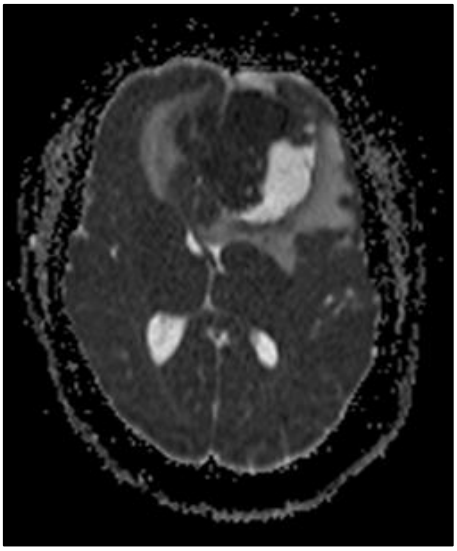

Figure 3b: ADC -Low signal within the solid component of the mass in bilateral frontal lobes.

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