Pneumosinus dilatans with intracranial meningioma
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Patient: 40 years, female

Clinical History:
A previously healthy 40-year-old lady presented with a long-standing bifrontal headache. Neurological examination was unremarkable.

Imaging Findings:
Contrast enhanced MR imaging of brain revealed an enhancing extra-axial mass lesion in the left anterior cranial fossa with mild mass effect over the adjacent left frontal cerebral parenchyma. There was associated asymmetric enlargement of the adjacent left frontal sinus. The enlarged sinus demonstrated bulging convex margins towards the mass lesion. Based on the imaging findings, a pre-operative diagnosis of intra-cranial meningioma with pneumosinus dilatans was suggested and confirmed histopathologically.

Discussion:
Pneumosinus dilatans (PSD), first described by Benjamin in 1918, refers to an abnormally dilated air-filled paranasal sinus without radiological evidence of osseous erosion, hyperostosis or mucosal thickening. Pneumosinus dilatans mainly involves the frontal sinus, followed by the sphenoid, maxillary and ethmoid sinuses in descending order of frequency [5]. The exact aetiopathogenesis of PSD remains uncertain.

It is frequently associated with intracranial and orbital meningiomas and arachnoid cysts [3]. Prior to the CT and MRI era, PSD was used as a helpful clue for identifying an underlying intracranial or orbital neoplasm [1, 2, 3]. In patients with progressive vision loss, the presence of sphenoid PSD helped in identifying optic nerve sheath and parasellar meningiomas. PSD is known to be an early sign of meningioma of the anterior chiasmatic angle [6]. Sphenoid sinus PSD can cause progressive optic atrophy and bi-temporal field defects [7].

Although PSD has been conventionally described on plain radiography, it can be very well diagnosed with CT and MR imaging [1, 3, 4]. The diagnostic criterion includes an abnormal enlargement and expansion of an air-filled paranasal sinus. CT of the head and paranasal sinuses is considered the imaging modality of choice [5]. An underlying intracranial lesion, if present, can be better characterised at MR imaging. Treatment of PSD is surgical and is recommended for cosmetic purposes [4].

To conclude, detection of PSD should alert the radiologist to look watchfully for an intracranial mass such as a
meningioma or arachnoid cyst, especially when it appears intrinsic to the brain.

**Differential Diagnosis List:** Meningioma with pneumosinus dilatans, Pneumocele, Hypersinus

**Final Diagnosis:** Meningioma with pneumosinus dilatans

**References:**


Figure 1

Description: An enhancing extra-axial mass is seen in the left anterior cranial fossa. This is associated with an abnormally and asymmetrically dilated left frontal sinus. Origin:
**Description:** The left frontal sinus is asymmetrically dilated. Note the normal-appearing left maxillary sinus. **Origin:**
Description: Precontrast images show convex contour of the visualised left frontal sinus. Origin:
Description: The inward bulging left frontal sinus is associated with an enhancing extra-axial intracranial mass lesion. Origin:
Description: The left frontal sinus is asymmetrically enlarged. It is bulging and shows convex margins towards the mass. Origin: