Neuroimaging Highlight

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Petrous Apex Granulomas: CT and MR Imaging

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A 29-year-old male complained of a four month history of horizontal, spontaneous, and nonprogressive diplopia. On examination he had a mild left sixth nerve palsy. The rest of his general and neurologic examinations were normal.

Computed tomography scanning demonstrated a non-enhancing, well-circumscribed, lesion in the left petrous apex (Figure 1). The opposite apex was well pneumatized. The lesion abutted the medial wall of the horizontal canal of the internal carotid artery and pointed towards the lateral wall of the sphenoid sinus. Unfortunately, CT bone windows were not available for this case but would have been helpful in terms of the differential diagnosis. An MRI demonstrated a predominantly high signal mass on T1 and T2 sequences (Figure 2). The diagnosis was a petrous apex granuloma.

The patient underwent a transphenoidal procedure and the lesion was explored through an opening in the sphenoid sinus. The fluid drained was thick and brown in colour. A small silastic tube was left in place to communicate the cyst with the sphenoid sinus. Postoperatively, the patient noted resolution of his diplopia and at six months follow-up, this has not recurred.

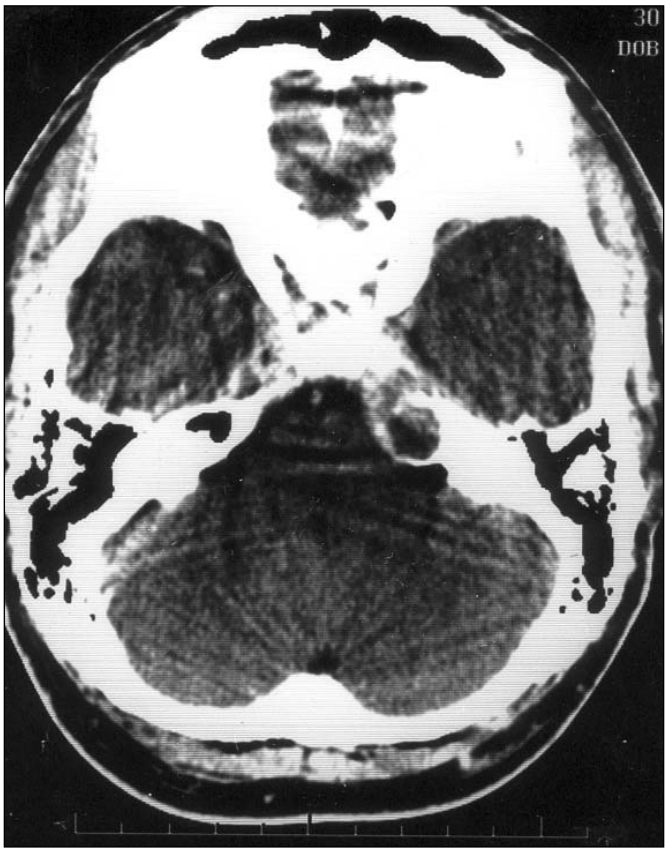

Figure 1: *CT scan demonstrating erosion and expansion of the left petrous apex by a low-density lesion.*

Discussion

Petrous apex granulomas are thought to occur due to obstructed aeration of the petrous air cells resulting in mucosal engorgement and hemorrhage.[1,2] Patients typically present with palsies involving the fifth, sixth, or less commonly the seventh cranial nerves. Trigeminal neuralgia has also been described in association with these lesions.[2] The differential diagnosis of petrous apex lesions includes cholesteatoma, mucocele, schwannoma, chordoma, metastasis, and petrous apicitis. The CT appearance is that of a smoothly marginated, nonenhancing, lesion involving the petrous apex. The contralateral petrous apex is consistently well-pneumatized.[2] The presence of bony destruction helps to differentiate cholesterol granulomas from other inflammatory lesions or epidermoid cysts which are more commonly associated with bony erosion.[3] The MRI appearance is nearly pathognomic with high signal on both T1 and T2 sequences, due to chronic inflammatory proteinaceous debris and met-hemoglobin, with only minimal or no contrast enhancement.

As the presumed pathophysiology involves obstruction of aeration, the prescribed treatments address this issue. Some advocate drainage procedures through the transphenoidal or

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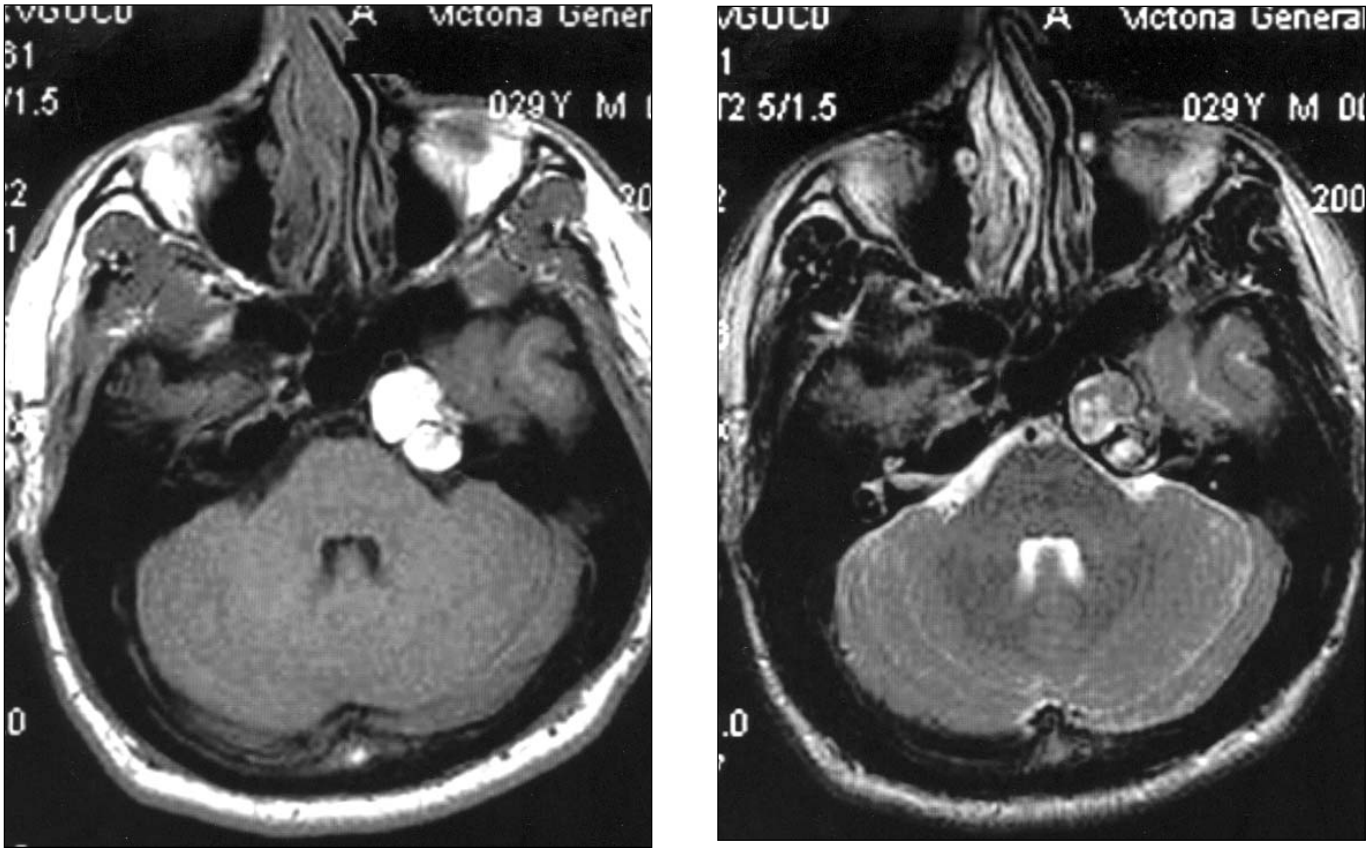

Figure 2: *MRI scans with T1 (a) and T2 (b) sequences showing a predominantly high signal lesion involving both petrous apices.*

transtemporal routes with stenting to a pneumatized space,[3,4] while others, citing a recurrence rate with this technique as high as 60%, recommend a more radical approach with complete excision of the granuloma.[2,5,6]

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