

Neuroglial Cyst

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Section: Neuroradiology

Case Type: Clinical Cases

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Patient: 72 years, male

Clinical History:

A 72 year old man was admitted with left arm weakness and visual symptoms. Admission CT imaging revealed a right parietal lobe intra-parenchymal haemorrhage. There was an additional incidental finding of a left frontal lobe hypodense abnormality, further characterised by contrast enhanced CT and MRI.

Imaging Findings:

A 72 year old man presented with sudden onset of left arm weakness associated with disturbed vision. CT imaging performed on admission revealed a right parietal lobe intra-parenchymal haemorrhage as the cause of his symptoms.

There was an incidental finding of a well circumscribed, hypodense abnormality within the left frontal lobe, which on contrast enhanced CT showed no enhancement. Follow-up pre- and post-contrast enhanced MRI confirmed the lesion. It was hypointense on T1W sequences and hyperintense on T2W, similar to that of CSF. There was no communication with the ventricular system, and no contrast enhancement was present. There was no evidence of surrounding oedema, or mass effect.

Discussion:

Cystic lesions are a common finding on MRI and CT brain imaging, representing a broad spectrum of pathologies. Differentiation and diagnosis of these cysts can be difficult on the basis of imaging alone. This case represents findings typical of a neuroglial cyst.

Neuroglial cysts are relatively uncommon, representing less than 1% of intracranial cysts. They can occur anywhere in the neuraxis, however the frontal lobe is the most typical location. In addition, intraparenchymal locations are more common than extraparenchymal.

These lesions are congenital, arising from sequestration of embryonic neural tube elements within the developing white matter. As shown, they are typically benign appearing with smooth, rounded contours. There is no surrounding signal intensity abnormality and they contain clear fluid resulting in characteristics similar to that of CSF on imaging. These cysts are most commonly incidental findings, but can present with symptoms such as headache, more commonly in adulthood than childhood.

The differential diagnosis for similar cystic abnormalities includes infectious cysts, cystic tumours, arachnoid cysts, enlarged perivascular spaces (PVS), and porencephalic cysts.

Infectious cysts includes Neurocysticercosis and Hydatid cysts, both of which are parasitic infections. Cysticercosis is the most common parasitic infection of the nervous system, and is caused by the larvae of *Taenia scolium* (the pork tapeworm). Most neurocysticercosis cysts are found in the subarachnoid space. Inflammation causes adhesion of adjacent gyral surfaces giving the impression the cyst is intraparenchymal. The appearances on imaging depend

on the stage of cyst evolution; early on the cyst is thin walled often with a mural nodule which represents the larval scolex.

Hydatid disease is endemic to many parts of the world, can occur almost anywhere in the body, and is caused by the larvae of *Echinococcus granulosus*. The cysts preferentially affect the liver, and cerebral hydatid cysts are extremely rare. Intracranial Hydatid cysts commonly occur in the middle cerebral artery territory, often within the parietal lobe. They are unilocular, thin walled, nonenhancing and large, growing upto 10cm in size.

Cystic tumours includes astrocytomas and hemangioblastomas. Pilocytic astrocytoma is the most common pediatric central nervous glial tumour. It has benign biological behaviour, thus, the survival rate is extremely high. Hemangioblastomas account for 10% of posterior fossa tumours. Both these types of tumours are typically thin walled with a mural nodule. These nodules enhance intensely following administration of contrast.

Arachnoid cysts are typically extra-axial, often with scalloping of the adjacent calvarium. If symptomatic, they tend to present in childhood. Enlarged PVSs are usually multiple and found in the basal ganglia regions; some atypically large PVSs can appear very similar to neuroglial cysts and can only be truly differentiated by pathology. Porencephalic cysts communicate with the lateral ventricles and show surrounding gliosis.

Neuroglial cysts are a diagnosis of exclusion and no pathological confirmation is required. Treatment is commonly to simply observe the lesion, however if symptomatic drainage or fenestration can be performed.

Differential Diagnosis List: Neuroglial cyst

Final Diagnosis: Neuroglial cyst

References:

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Radiology. 2006 Jun;239(3):650-64. (PMID: [16714456](#))

Kwee RM, Kwee TC (2007) Virchow Robin Spaces at MR Imaging. Radiographics 2007;27:1071-1086. (PMID: [17620468](#))

Epelman et al. Differential Diagnosis of Intracranial Cystic Lesions at Head U/S: Correlation with CT and MR Imaging. Radiographics 2006;26:173-196. (PMID: [16418251](#))

Hydatid Disease from Head to Toe. Radiographics 2003;23:475-494.

Figure 1

a



Description: Axial non-enhanced CT brain. The right posterior parietal lobe haemorrhage is partially seen. Well circumscribed hypodense left frontal lobe abnormality demonstrated, with no sign of surrounding gliosis or evidence of ventricular communication. **Origin:**

b



Description: Saggital mulitplanar reconstruction of non-enhanced CT brain. The hypodense abnormality is clearly demonstrated. **Origin:**

Figure 2

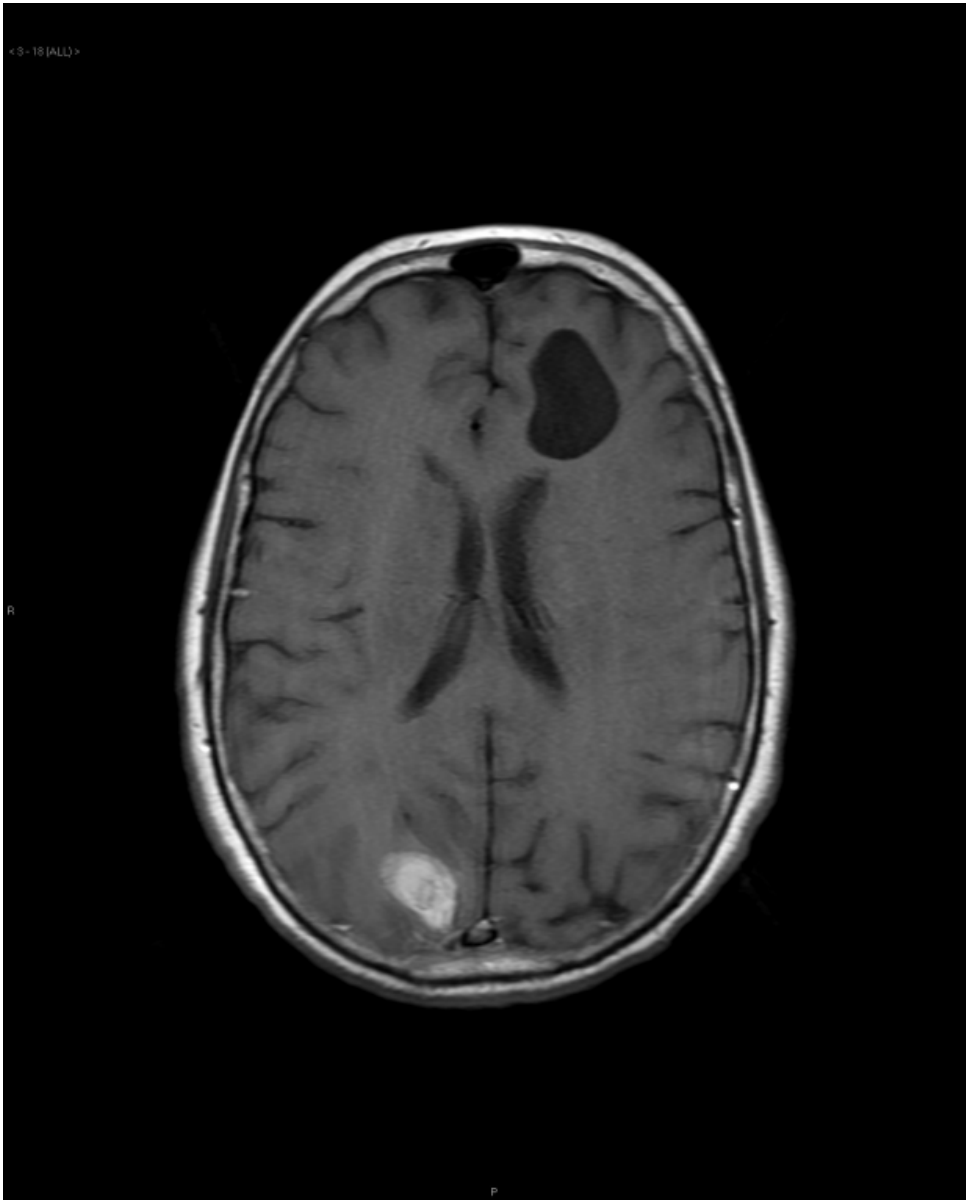
a



Description: Post contrast axial CT of brain shows no enhancement within the wall or substance of the abnormality. **Origin:**

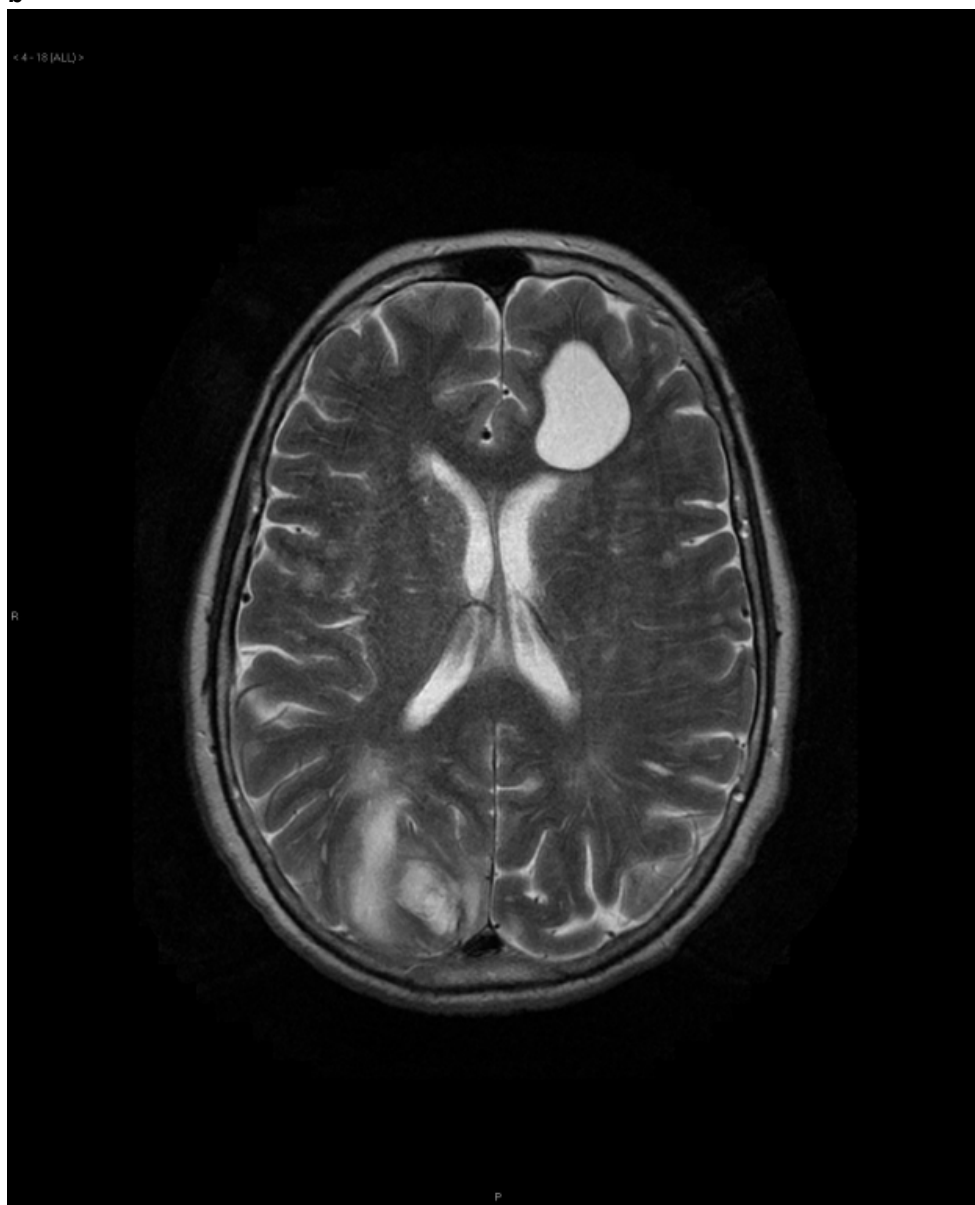
Figure 3

a



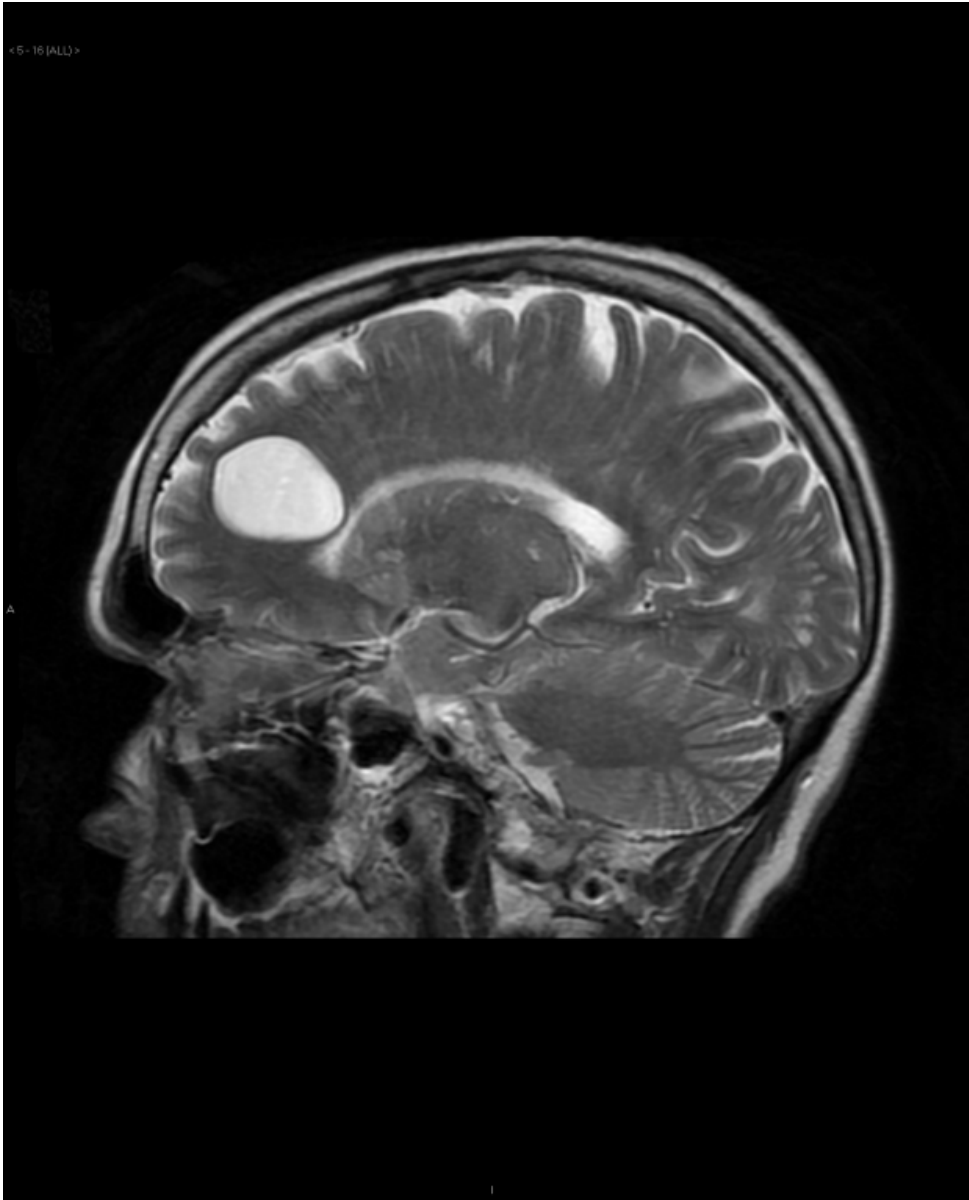
Description: Axial pre-contrast T1W image of the brain. The hypo-intense abnormality within the left frontal lobe is clearly demonstrated, with no apparent communication with the ventricular system. Hyperintense lesion within right posterior parietal lobe representing haemorrhage. **Origin:**

b



Description: Axial T2W image shows hyperintense character of the lesion; signal intensity similar to that of CSF. Note also the peri-haemorrhagic oedema. **Origin:**

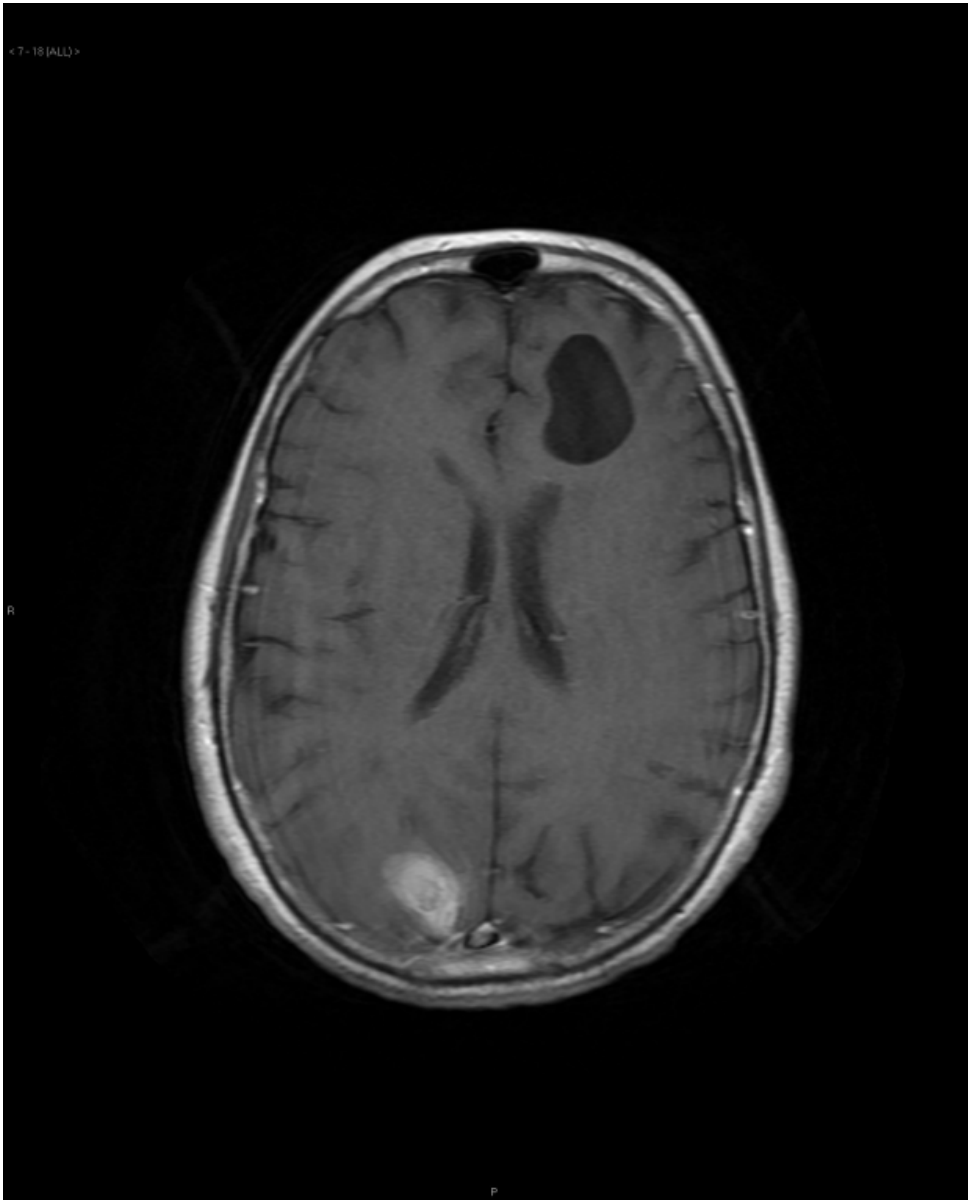
C



Description: Saggital T2W image of the lesion. The lesion indents on the frontal horn of the left lateral ventricle, but there is no communication evident between the two. **Origin:**

Figure 4

a



Description: Axial T1W, post-contrast image of the brain. There is no contrast enhancement of the lesion. **Origin:**