A symptomatic Sylvian fissure lipoma in a post-traumatic patient

Rakan Farouk Bokhari[1*], Mohammad Hasan Bangash[1], Naushad Ali Basheer Ahamed[1], Jameel Addas[1]

1. King Abdul Aziz University Hospital, Jeddah, Kingdom of Saudi Arabia

* **Correspondence:** Rakan Farouk Bokhari, Division of Neurosurgery, Department of Surgery, King Abdul Aziz University hospital, Jeddah, Kingdom of Saudi Arabia
(*rakbokhari@hotmail.com*)

Radiology Case. 2014 Apr; 8(4):1-7 :: DOI: 10.3941/jcrr.v8i4.1174

ABSTRACT

Lipomatous extra-axial lesions in the Sylvian fissure are a rare entity. Their identification, however, is usually simple if a systematic radiological approach is adopted. The best line of management for these lesions is still a matter of controversy and fraught with complications. We present a case of a Sylvian fissure lipoma referred to our neurosurgery services with symptomatic seizures and in a post-traumatic patient. The radiological differentiating features of intracranial lipomas and intracranial dermoids have been discussed. The unusual location of the lesion, in combination with the history of seizures and the nature of presentation (trauma being a red-herring) make this case an interesting find. The lesion was managed conservatively with good outcomes at follow up, on anti-epileptic medications.

CASE REPORT

CASE REPORT

A previously healthy, 20 year old male patient of South Asian decent was brought to our emergency room in a confused state. Witnesses reported that he had slipped and had fallen, hitting the back of his head on a hard surface. He developed a short lasting generalized tonic clonic seizure and woke up a few minutes later confused and was complaining of a severe headache.

History was positive of several preceding episodes of similar fits over the past few weeks.

Examination revealed a conscious but confused patient with no recollection of the events leading to his presentation. A quick assessment revealed a Glasgow coma score of 14/15 with normal pupils. There were no signs of lacerations, contusions or bruises on his scalp or face. No signs of discharge, bloody or otherwise, from his nose or ears. Examination also did not reveal any stigmata of skull base injuries.

The patient, after initial stabilization, was shifted to undergo a CT scan of the brain. The initial review by the emergency physician was highly suspicious for pneumocephalus with a large mass of air-like low density in the Sylvian fissure. This finding caused an urgent neurosurgical referral to be made, for the possibility of a skull base fracture and subsequent pneumocephalus. Further review of the images by a radiologist was requested.

Radiologic features:

The non-contrast axial CT scan, performed in a Siemens 16 slice CT scanner was reviewed and showed a size-able 'umbrella' shaped extra-axial lesion centered in the right Sylvian fissure with an average CT density of about -108 HU [Figure 1a and 1b]. There was no fracture or sub-galeal soft tissue changes to suggest a trauma. A provisional diagnosis of a lipid-rich lesion was made thus clearing the initial suspicion of pneumocephalus. The lesion approximately measured about 3.5 x 1.4 cms in its longest oblique diameters.

However, as the patient gave a history of preceding episodes of seizures, the patient was admitted under the neurosurgical team, for further work up of the mass by MR imaging.

MRI of the brain was subsequently performed using a 3T Verio Siemens scanner. The lesion was seen centered in the right Sylvian fissure appearing near homogenous hyper-intense on T1W and T2W images [Figure 2, 3 and 4], with signal suppression on fat-suppressed sequences [Figure 5]. Diffusion Weighted Images (DWI) and Apparent Diffusion Coefficient (ADC) images were studied [Figure 8] and showed no evidence of diffusion restriction and remained signal suppressed in both DWI and ADC images.

Contrast was administered, however no enhancement was demonstrated.

The proton density images [Figure 4] and the 3D rendering of the time of flight (TOF) MR angiography [Figure 6] showed that the mass was encasing the M2 Sylvian segments of the right middle cerebral artery. As the lesion was seen to encase and not displace the vasculature a radiological diagnosis of a Sylvian fissure lipoma was made with some degree of confidence. The subjacent gyri did not show any cortical signal abnormality or expansion.

Subsequent clinical course:

The diagnosis was therefore believed to be a Sylvian fissure lipoma. The patient was put on antiepileptic medications and a three-month follow up showed satisfactory control of seizures. He has since travelled back to his home country. Contact with his relatives 12 months later revealed no change in status.

DISCUSSION

Intracranial lipomas (ICL) are rare congenital malformations of the brain, accounting for about 0.34% of all brain lesions encountered [2]. The typical location of these lesions is in the midline with the pericallosal distribution predominating [3]. Initially believed to be neoplasms of mesodermal origin differentiating into adipose tissue, they are now believed to be remnants of the meninx primitive that mal-differentiated during the development of the subarachnoid cisterns. They are therefore congenital anomalies and not neoplasms [4].

Our case displays a rare location for this uncommon pial-based lesion, with only a small portion of cases, ranging from 3.4-5% described in this location [4,5]. The described features [6] on CT imaging include homogenous well-circumscribed, hypo-dense masses with densities in the negative range between - 40 to -120 Hounsfield units. These are distinctly different from pneumocephalus, which typically show gas density with Hounsfield numbers around -1000 HU.

Calcifications in the capsule have been described, as well as a lack of contrast uptake.

MR signals for lipomas are typical for adipose rich tissues, seen as hyper-intense signals on T1 and T2 weighted sequences with signal suppression on fat saturated sequences. [4].

On DWI / ADC images these lesions, due to their fat content remain signal suppressed without restriction of diffusion. [Figure 8]

The most relevant differential diagnosis for such a mass with marked adipose component is a mature dermoid, with both being very similar on imaging despite dissimilar pathogenesis [3,6].

The radiological features favouring the diagnosis of dermoid include, markedly heterogeneous signal intensities reflecting the multiple tissue components (stratified squamous epithelium found in skin, desquamated epithelial keratin and some lipid material like cholesterol crystals) characteristic of these tumours. Lipomas on the other hand are more likely to be homogenous and lobulated.

Another key differentiating feature is the growth pattern of these tumours. Lipomas are infiltrative tumours that may encase the local vasculature and cranial nerves. It may also invade and adhere to the underlying brain parenchyma [7]. Dermoids on the other hand are encapsulated lobulated masses with an outer wall of stratified squamous epithelium that expand and displace the neighboring structures.

Our mass was lobulated and of slightly heterogeneous signal intensity, not unexpected in lipomas, however this lesion is shown to encase the MCA branches making the diagnosis of a lipoma more likely.

The vast majority of these tumours, is believed to be asymptomatic and of minimal mass effect, with their discovery incidental on brain imaging for other causes [8]. This poses a dilemma, as the natural tendency when identifying a lesion in a symptomatic patient is to identify it as the culprit behind the patient's presentation. This has been proven wrong in several instances [8,9] with one series of epileptic patients presenting with an ICL identifying only one case of five as caused by the lipoma [9].

The management of these tumours is therefore fraught with controversy [1,4,10]. Though associated with seizures, resection aimed at treating epilepsy is rarely curative and often leads to disappointing results [10,7]. The reason being that the epileptogenic focus only occasionally corresponds to the lipoma. The main culprit may be underlying cortical dysplasia or an associated anomaly as reported to occur in more than 50% of cases of symptomatic patients. [4]. However in our case, no evidence of cortical dysplasia or other coexistent congenital anomaly was shown. Another reason for poor outcomes is the high morbidity of surgical resection of such a lesion usually encasing major regional vessels and nerves. This has led to a consensus that anti-epileptic medication is the initial treatment of choice and not resective surgery [4]. Recent advances in micro-neurosurgery have resulted in successful complete resection of such lesions without morbidity, calling this view into question [1].

In conclusion, we present a rare intracranial location of a lipoma. The case illustrates that a careful analytic approach should be adopted with all cases encountered in the emergency room, as what appears at first impression to be a straightforward case, may in fact prove otherwise.

TEACHING POINT

Intracranial lipomas are infiltrative tumours and tend to insinuate between or around vessels and nerves, opposed to dermoids which are encapsulated tumours displacing these structures. In symptomatic patients, associated cortical dysplasia or other anomalies need to be ruled out.

REFERENCES

1. Chao SC, Shen CC, Cheng WY. Microsurgical removal of Sylvian fissure lipoma with pterion keyhole approach-case report and review of the literature. Surg Neurol. 2008 Dec;70 Suppl 1:S1:85-90. Epub 2008 Sep 11. PMID: 18789493

2. Kazner E, Stochdorph O, Wende S, Grumme T Intracranial lipoma. Diagnostic and therapeutic considerations. J Neurosurg.1980; 52:234-245 PMID: 7351564

3. Jabot G, Stoquart-Elsankari S, Saliou G, Toussaint P, Deramond H, Lehmann P. Intracranial lipomas: clinical appearances on neuroimaging and clinical significance. J Neurol. 2009 Jun; 256(6):851-5. Epub 2009 Mar 12. PMID: 19280105

4. Truwit CL, Barkovich AJ. Pathogenesis of intracranial lipoma: an MR study in 42 patients. AJR Am J Roentgenol. 1990; 155:855-864 (discussion 865)

5. Maiuri F, Crillo S, Simonetti L. Lipoma of the sylvian region. Clin Neurol Neurosurg 1989; 91:321-3. PMID: 2555092

6. Osborn A. Lipoma. In: Amirsys (ed) Diagnostic imaging brain.2005; Salt Lake City, I-1 22p

7. Feldman RP, Marcovici A, LaSala PA. Intracranial lipoma of the sylvian fissure. Case report and review of the literature. J Neurosurg 2001; 94:515-519 PMID: 11235959

8. Yildiz H, Hakyemez B, Koroglu M et al (2006) Intracranial lipomas: importance of localization. Neuroradiology 48:1-7 PMID: 16237548

9. Loddenkemper T, Morris HH 3rd, Diehl B, Lachhwani DK. Intracranial lipomas and epilepsy. J Neurol. 2006 May; 253(5):590-3. Epub 2006 May 18. PMID: 16767540

10. Tahmouresie A,Kroll G, Shucart W (1979) Lipoma of the corpus callosum. Surg Neurol 11:31-34

FIGURES

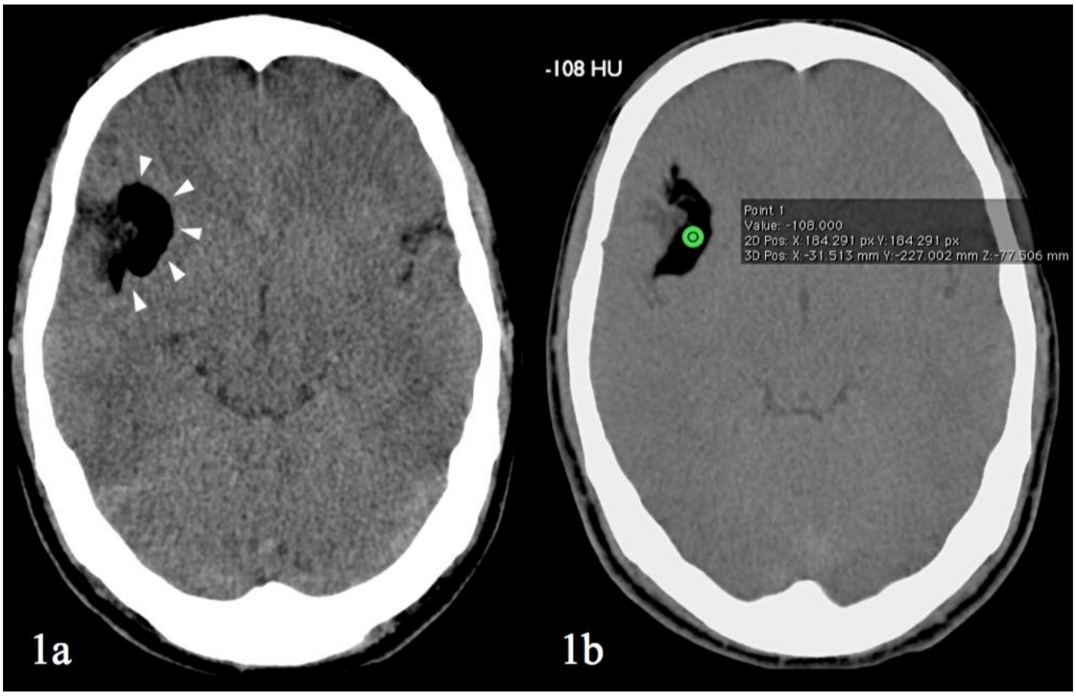


Figure 1: 20 year old male with a Sylvian fissure lipoma. Axial non-contrast CT images using a Siemens SOMATOM Definition Dual source CT scanner. (Kv -120, mA - variable rannge with CareDose activated ranging between 144 and 181mA, Slice thickness - 4.5mm)
Selected axial non contrast CT section of the brain at the level of the Sylvian fissure, shows a low attenuation extra-axial mass, measuring about 3.5 x 1.4 cms , centered in the right Sylvian fissure with an average CT density of about -108 HU.

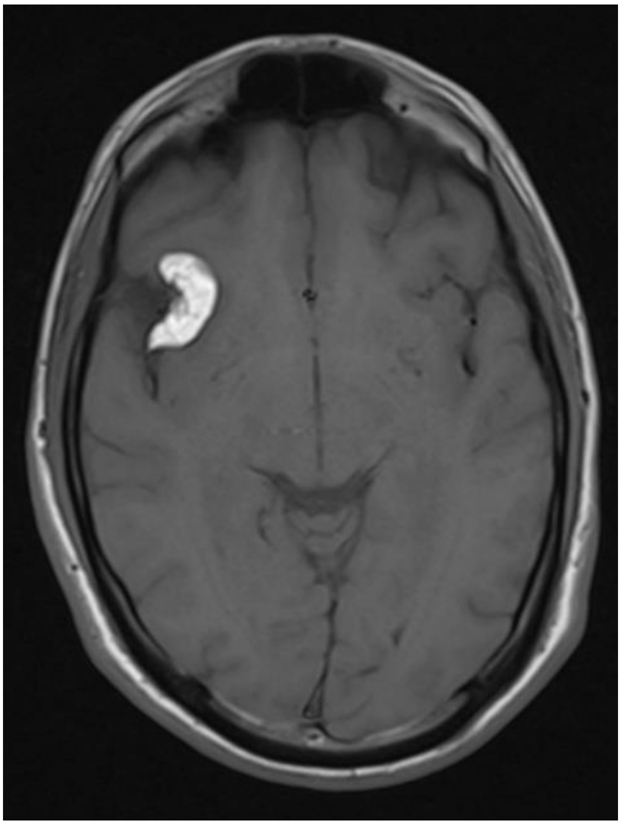


Figure 2: 20 year old male with a Sylvian fissure lipoma. Axial non-contrast T1 weighted image using a Siemens MAGNETOM 3T Verio MR scanner. (TE-8.4, TR-500)
Selected Axial T1W image showing a near homogenous, hyper-intense, 'umbrella' shaped extra-axial lesion centered in the Sylvian fissure measuring about 3.5 x 1.4 cms.

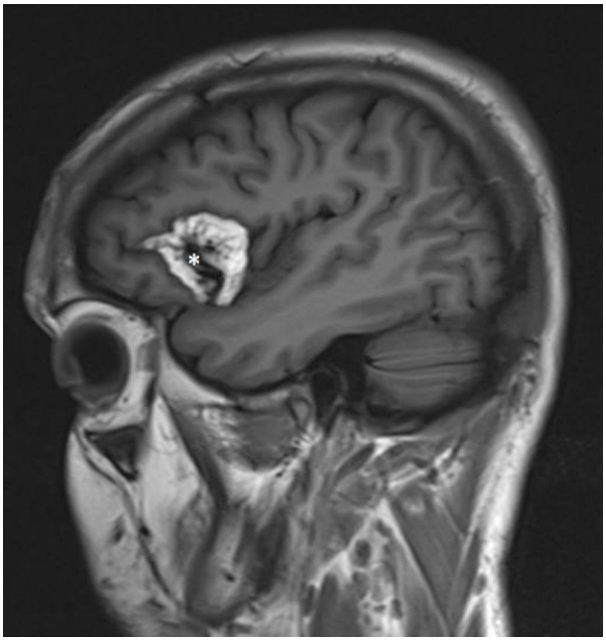


Figure 3: 20 year old male with a Sylvian fissure lipoma. Sagittal non-contrast T1 weighted image using a Siemens MAGNETOM 3T Verio MR scanner. (TE-9, TR-2000)
Selected sagittal T1 image, showing the lesion within the right Sylvian fissure. The asterisk (*) denotes the M2 Sylvian segment of the right middle cerebral artery.

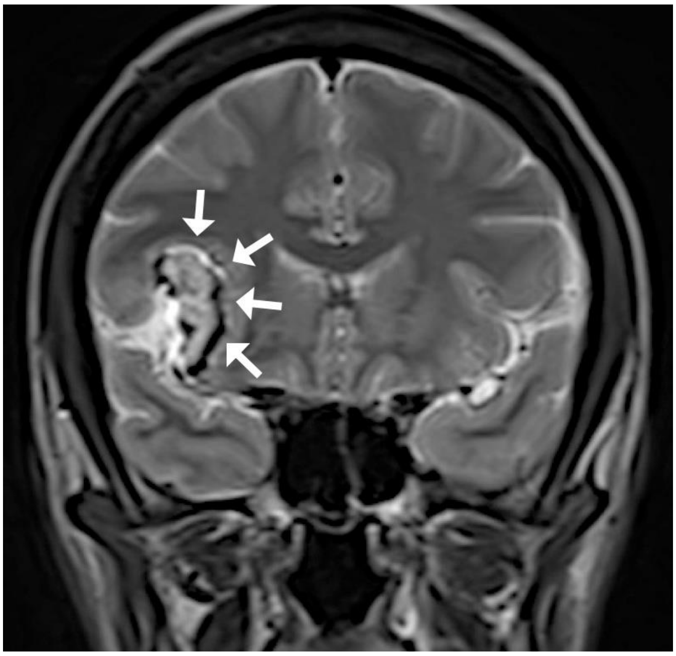


Figure 4: 20 year old male with a Sylvian fissure lipoma. Coronal non-contrast T2 weighted image using a Siemens MAGNETOM 3T Verio MR scanner. (TE-83, TR-4890)
Coronal T2 image shows the lesion within the right Sylvian fissure (marked by arrows).

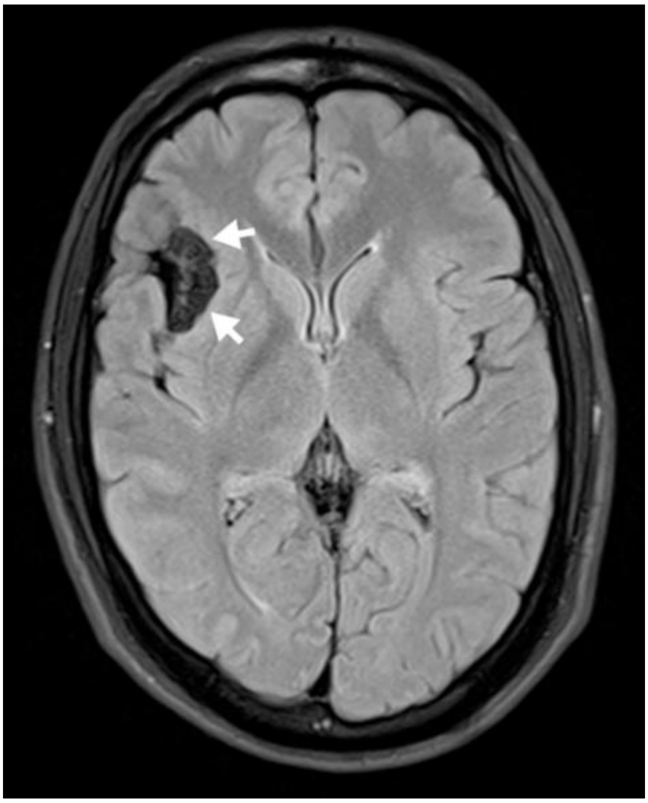


Figure 5: 20 year old male with a Sylvian fissure lipoma. Axial non-contrast T2 FLAIR with Fat Supression using a Siemens MAGNETOM 3T Verio MR scanner. (TE-90, TR-9000, TI-2500)
On fat saturated FLAIR imaging the lesion (arrow) shows near total signal suppression in keeping with a predominantly fat containing lesion.

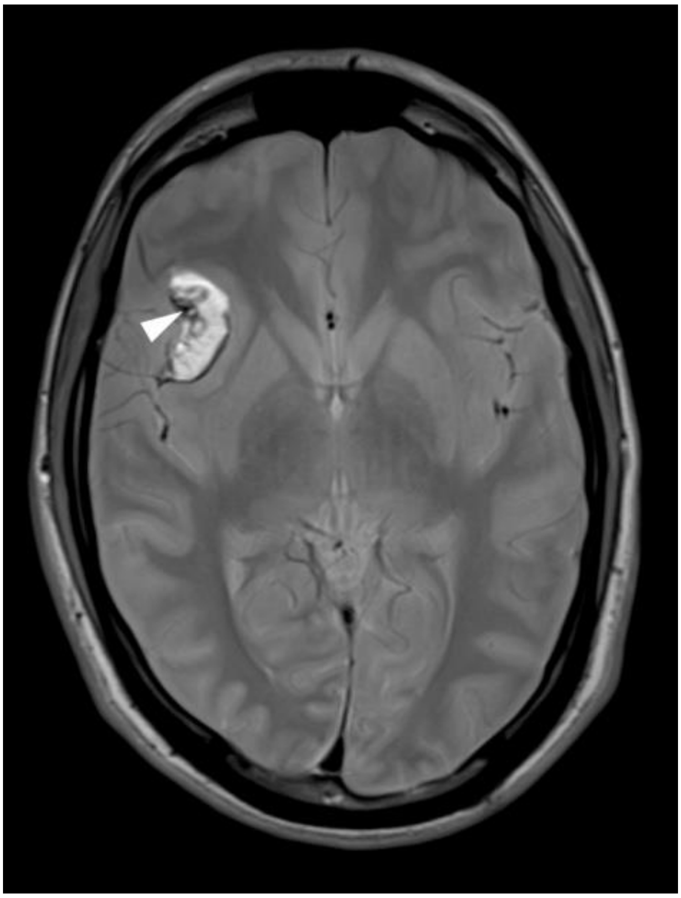
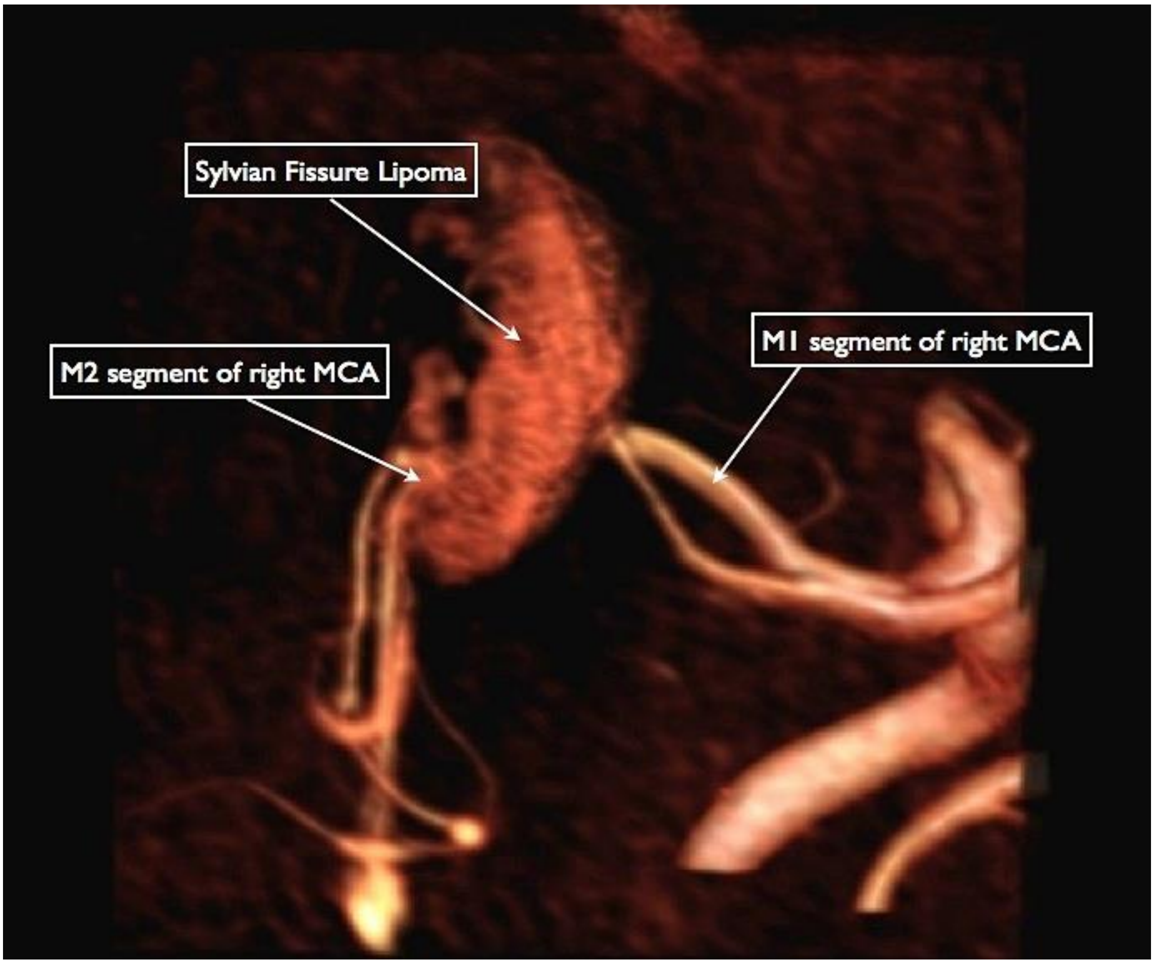


Figure 6 (left): 20 year old male with a Sylvian fissure lipoma. Axial non-contrast Proton density image using a Siemens MAGNETOM 3T Verio MR scanner. (TE-19, TR-3340)
Selected axial Proton Density image showing the lesion within the Sylvian fissure, encasing multiple vascular flow voids (arrowhead) corresponding to the Sylvian (M2 segment) of the right middle cerebral artery (MCA).

Figure 7 (bottom): 20 year old male with a Sylvian fissure lipoma. 3D volume rendered image from a contrast enhanced MR angiogram (volume rendered on a TerraRecon iNtution Viewer).
Volume rendered 3D time of flight (TOF) MR angiogram showing the mass encasing the Sylvian (M2) segment of the right middle cerebral artery (MCA).



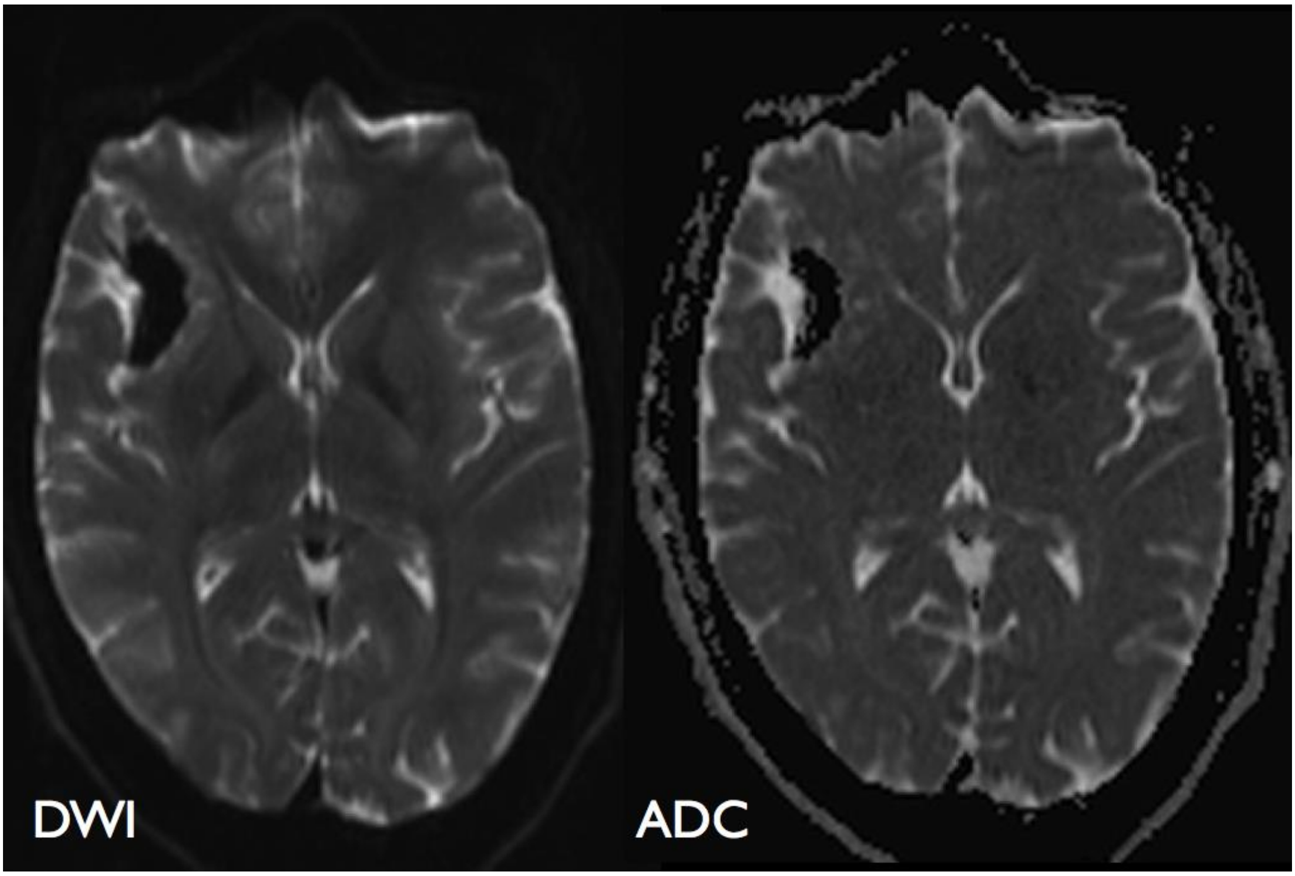


Figure 8: 20 year old male with a Sylvian fissure lipoma. B1000 diffusion weighted image (DWI) and the corresponding apparent diffusion coefficient (ADC) map. (TE - 110, TR - 4500)
No evidence of restricted diffusion. The lesion remains signal supressed on DWI / ADC images.

Incidence	3.4 – 5.0 % within the Sylvian fissure
Gender ratio	No specific established gender bias.
Age predilection	None
Risk factors	None
Treatment	The treatment is usually symptomatic. If associated with cortical dysplasia surgical removal may be considered.
Prognosis	Good
Imaging Findings	Lipomatous lesion with homogenous fat density on CT and MR centered in the Sylvian Fissure. Usually seen to encase the adjacent vasculature.

Table 1: Summary table for Sylvian fissure lipoma

Pathology	Lipoma	Dermoid
Plain Radiograph	Peripheral calcification maybe seen	Usually micro calcification and maybe seen as faint calcifications
Ultrasound	Trans-cranial ultrasound maybe performed but is of low diagnostic yield.	Trans-cranial ultrasound maybe performed but is of low diagnostic yield.
CT features	Homogenous fat densities between -20 to -120 HU	Well defined heterogeneous low attenuating lobulated masses of fat densities
MRI features on T1 WI, T2 WI and STIR images	T1 WI – near homogeneous hyperintense	T1 WI – Predominantly hyperintense due to presence of cholesterol droplets
	T2 WI – near homogeneous hyperintense	T2 WI –Variable signals from hypo-intense to hyperintense
	STIR / Fat saturated sequences – complete signal suppression.	STIR / fat saturated sequences – Variable signal suppression
CEMR	No enhancement	Usually do not enhance, if enhancement is shown, rim enhancement may be seen.
DWI / ADC	No diffusion restriction	No diffusion restriction

Table 2: Differential Diagnosis table for Sylvian fissure lipoma

ABBREVIATIONS

CT = Computed Tomography
HU = Hounsfield Units
ICL = Intracranial Lipoma
MCA = Middle Cerebral Artery
MRI = Magnetic Resonance Imaging
PET-CT = Positron Emission Tomography- Computed Tomography
TOF = Time of Flight

KEYWORDS

Lipoma; Sylvian fissure; Seizures; Epilepsy; Extra-axial lesion