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Case Study

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HIDDEN HIGH GRADE GLIOMA MICKING STROKE

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INTRODUCTION

High grade gliomas are WHO grade IV tumors and account for 12-15% of all intracranial neoplasm.[1]
High grade gliomas are relentless, progressive disease, and mean survival is under one year.
Some cases of high grade gliomas initially present with stroke like neurological symptoms.
Rapid and accurate recognition of lesions masquerading as acute stroke is important.
Any incorrect or delayed diagnosis of stroke mimics will not only increase the risk of being unnecessary interventional therapies, but will also delay treatment.

HISTORY AND CLINICAL PRESENTATION

A 70years old female without significant medical history(such as hypertension, diabetes or atherosclerosis) was admitted with sudden onset of right upper limb weakness.

She underwent brain magnetic resonance imaging(MRI) which revealed an altered signal intensity lesion in left motor cortex which was hyperintense on T2/FLAIR showing T2 shine through effect on DWI(Figure 1).

IMAGING GFINDINGS

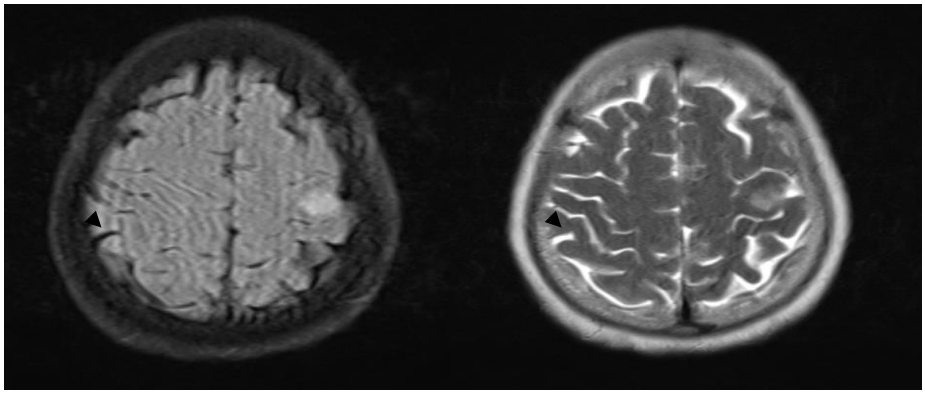

Fig 1a **Fig 1b**

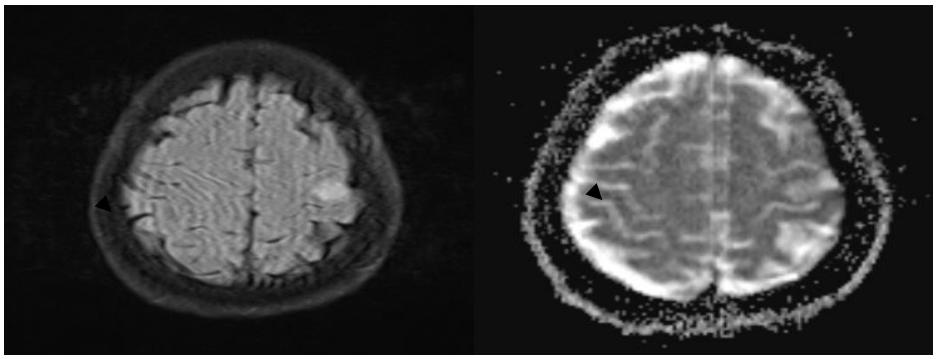

Fig 1c **Fig 1d**

Figure 1(a&b): Axial T2WI(1a) shows hyperintense lesion in left premotor cortex which is hyperintense on FLAIR(1b)

Figure 1(c&d): DWI images showing the lesion bright on both TRACE and ADC images s/o shine through.

Based on the MRI findings of T2/FLAIR hyperintensity area showing T2 shine through on DWI in a patient presenting with sudden onset neurological deficit the diagnosis of subacute infarct was kept.

She improved after treatmemt and discharged on the fifth hospitalization day.

Her limb weakness was severely aggravated two months after discharge. Also she began to have slurring of speech and flickering movement of eye lids. She was readmitted with a power grading of 2/5 on right upper limb.

Repeat brain MRI was performed with administration of contrast agent.

The MRI revealed a well defined oval, intra axial lesion in left motor cortex which was hyperintense on T2/FLAIR WI, hypointense on T1 WI with areas of diffusion restriction and susceptibility changes with in it.

On MR perfusion there is four to five times increase in rCBV. On MRS(TE135) there is raised choline peak with reduced NAA peak.

This lesion has mass effect in form of effacement of adjacent sulci with minimal surrounding edema.

The diagnosis of high grade glioma(likely gliosarcoma) was kept.

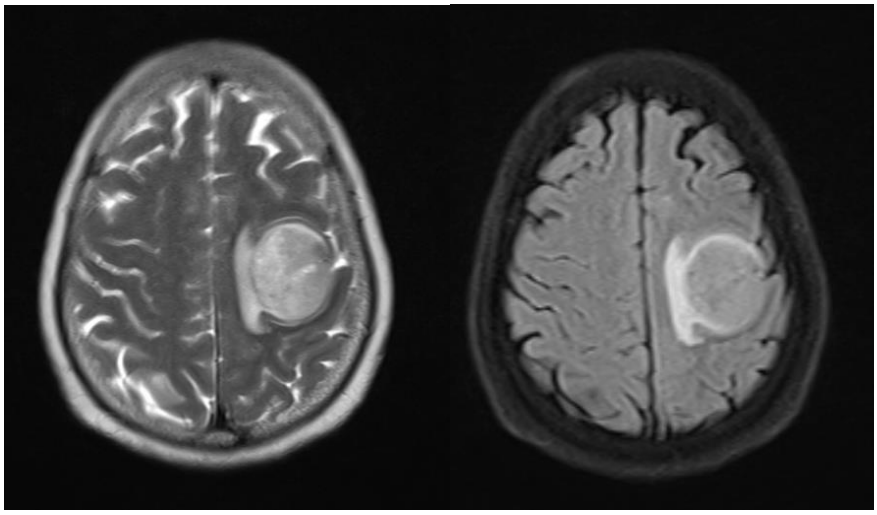

Fig 2a **Fig 2b**

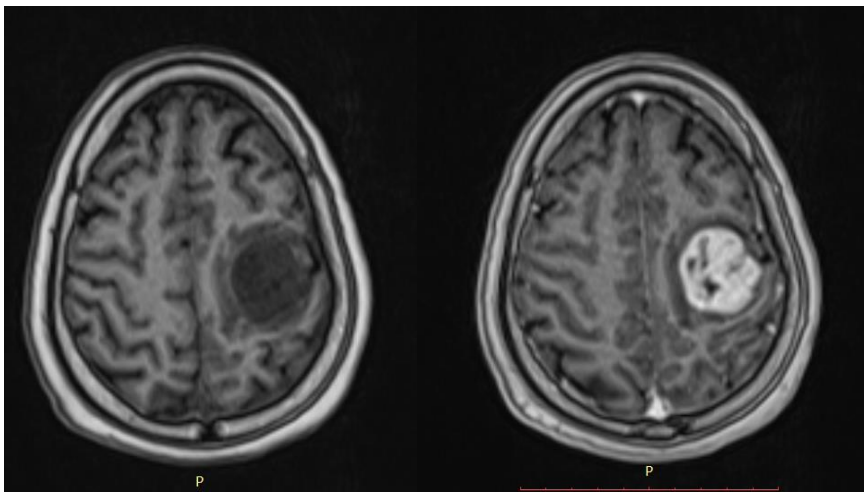

Fig 2c **Fig 2d**

Figure 2(a,b,c&d): MRI showed altered signal intensity lesion in left frontal lobe which is hyperintense on T2 WI(2a), FLAIR(2b), hypointense on T1 WI(2c) and shows intense enhancement with few nonenhancing areas on post contrast images(2d).

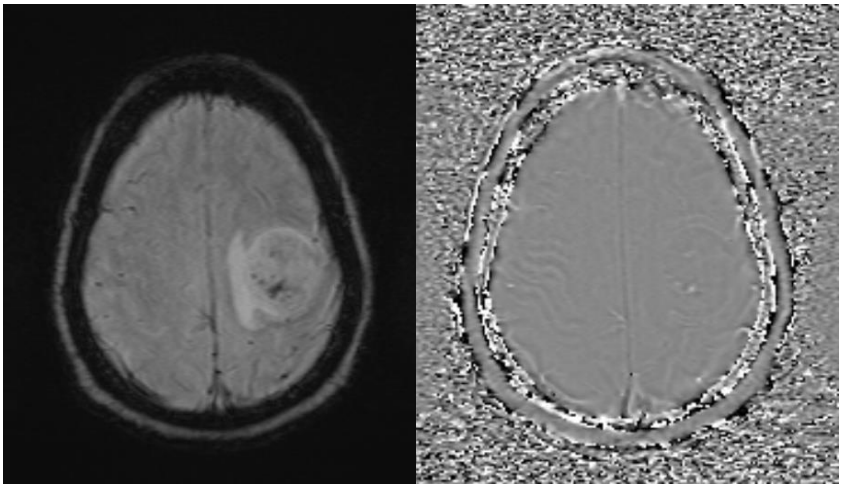

Fig 3a Fig 3b

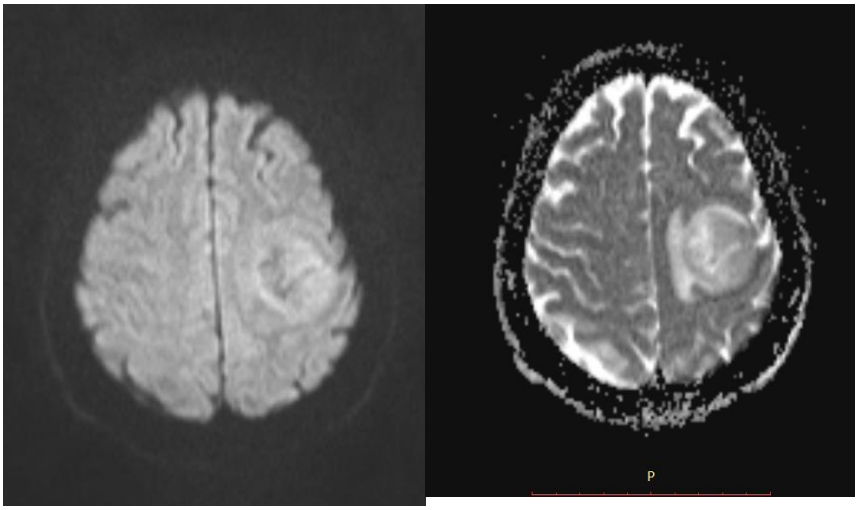

Fig 3c Fig 3d

Figure 3(a&b): SWI phase and magnitude images showing areas of blooming with positive phase effect s/o hemorrhage.

Figure 3(c&d): DWI (TRACE and ADC) showing areas of diffusion restriction.

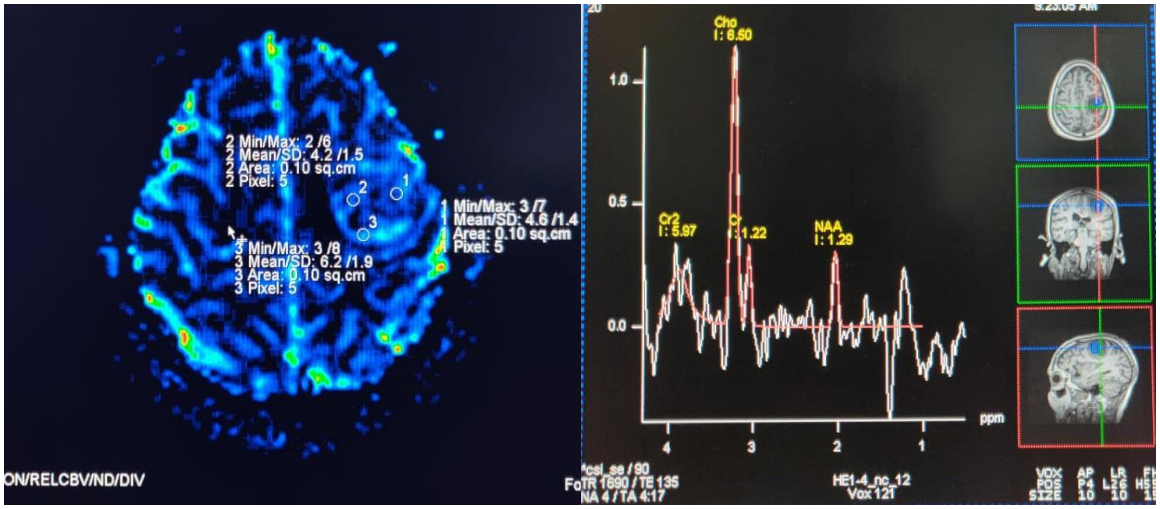

Fig 4a Fig 4b

Figure 4a: Perfusion MR image shows 4-5 times increase in rCBV in the lesion.

Figure 4b: MRS(TE135) shows increase in choline and lactate peak and decrease in NAA peak in the lesion.

The patient underwent tumor resection.
The histologic examination revealed features of primary glial tumor, with moderately pleomorphic spindle cells, with gliotic background. The pathological diagnosis was gliosarcoma.

DISCUSSION

Intracranial tumors may present with sudden onset of stroke like symptoms, which sometimes are misdiagnosed as ischaemic stroke.
3-5% brain tumors were initially diagnosed as strokep.[2]
Gliomas, meningiomas and metastases are most common intracranial tumors masquerading as acute stroke.[3]
The majority of gliomas mimicking stroke are glioblastomas(WHO grade IV).[3]
It is uncommon for high grade gliomas to present symptoms mimicking stroke.
In our case high grade glioma was readily misdiagnosed as a cerebral infarct as led by focal neurological symptoms and brain imaging.
Small isodense intracranial tumors with no evidense of mass effect may be missed on nonenhanced CT, however they are easily detected on postcontrast CT or MRI.
Therefore, whenever there is a suspicion of an intracranial tumor masquerading as acute stroke, a post contrast examination should be part of imaging protocol.
High grade gliomas on MRS show an elevated choline peak(reflecting increased membrane synthesis), reduced NAA(reflecting reduced neuronal elements) compared to normal brain tissue. Sometimes elevated lipid and lactate peak can be seen in necrotic areas.[4]
In cases of subacute infarct the choline peak tends to decrease rather than to increase as in case of glioma.[5]
The choline peak, which may be associated with cellular density and cellular proliferation, is helpful for selection of targets for biopsy.
Some high grade gliomas initially present with imaging findings s/o ischaemic stroke, however with due course they enlarge in size, produce mass effect and develop internal hemorrhage and necrosis.
In these cases repeat MRI after six to eight weeks can easily unsurface the hidden high grade glioma.

CONCLUSION

High suspicion of high grade glioma should be kept in patients presenting with symptoms of stroke and follow up imaging should be done in six to eight weeks for unsurfacing hidden high grade glioma.
When atypical symptoms and radiographic results arise, along with failure of clinical improvement, MRS and biopsy should be considered for differential diagnosis of glioma and stroke to avoid improper and delayed treatment.

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