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Supratenorial Haemangioblastoma with Bleed: Imaging Findings

JAYA SELIN PRAVEENA JOSEPH[1], PABBISETTY SUSHMA[2], SENTHIL KUMAR AIYAPPAN[3]

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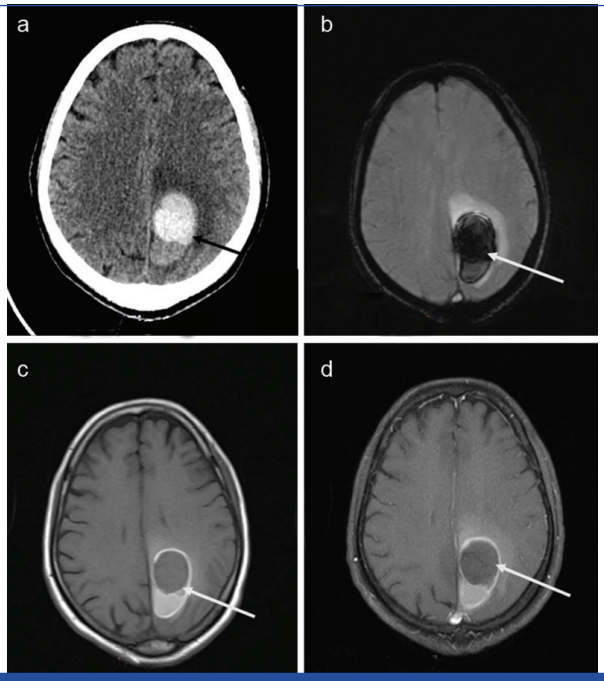
A 48-year-old male presented with complaints of severe headache for the past two weeks. There was no history of loss of consciousness, vomiting, or seizure episodes. The patient was not a known case of diabetes mellitus, epilepsy, or systemic hypertension. On examination, the Glasgow Coma Scale was E4M6V5. Bilateral pupils were equally reactive to light and extraocular movements were normal. There was no facial weakness. Tone and power were normal in all four limbs, neck, and trunk. The plantar reflex was flexor on both sides. The deep tendon reflexes were normal, and there were no cerebellar signs. The patient had a normal gait. Laboratory investigations, including complete blood count, urea, creatinine, electrolytes, liver function tests, and coagulation profile, were within normal limits. Serology for hepatitis B and C viruses, as well as human immunodeficiency virus, returned negative results.

The patient underwent Computed Tomography (CT) of the brain, followed by Magnetic Resonance Imaging (MRI) of the brain with contrast. The CT scan revealed a hyperdense lesion measuring approximately 4.5×3.3×2.9 cm in the left posterior parafalcine region of the parietal lobe, with moderate perilesional oedema [Table/Fig-1a]. The possibility of an intraparenchymal haemorrhage was considered. Since there was no history of trauma and the patient was not hypertensive, a haemorrhagic neoplasm was also considered as a differential diagnosis. The MRI of the brain with contrast revealed a well-defined T2/FLAIR hyperintense, T1 hypointense lesion with a peripheral T1 hyperintense rim showing blooming on gradient images [Table/Fig-1b], situated in the left posterior parafalcine area, with moderate perilesional oedema [Table/Fig-1c,d]. The lesion measured approximately 4.5×3.3×2.9 cm. There was no significant post-contrast enhancement. Consequently, the possibilities of both intraparenchymal haemorrhage and a haemorrhagic neoplasm were considered.

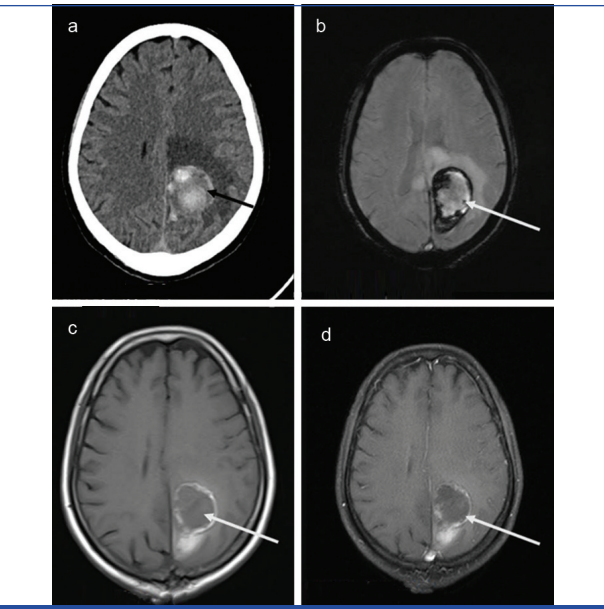
The patient was kept under follow-up, and after four weeks, repeat MRI and CT were performed. The repeat CT showed a decrease in the hyperdensity of the haemorrhage; however, there was a mild increase in the size of the lesion, which measured approximately 4.7×3.5×3.3 cm, along with a mild increase in the surrounding oedema [Table/Fig-2a]. The repeat MRI with contrast indicated a mild increase in oedema with a reduction in blooming, suggestive of a decrease in haemorrhagic areas, with no significant post-contrast enhancement [Table/Fig-2b-d].

The patient subsequently underwent left parieto-temporal craniotomy with excision of the lesion. Histopathological examination of the lesion revealed features of a haemangioblastoma, classified as a WHO grade 1 tumour. The patient did not exhibit any other features to suggest von Hippel-Lindau's disease. Postoperative CT of the brain showed complete resolution of the lesion with postoperative changes [Table/Fig-3a,b]. The patient is currently under follow-up and is doing well.

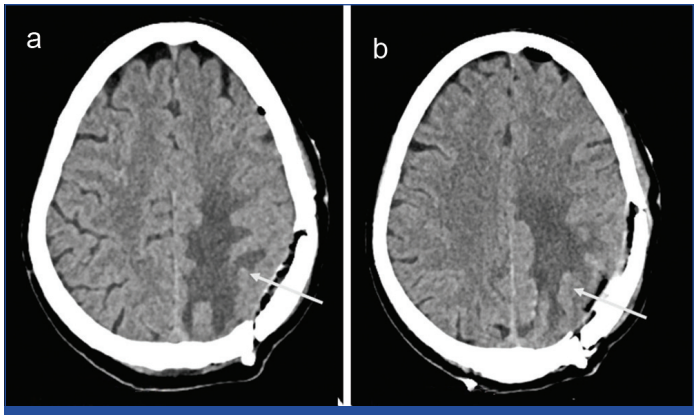
Haemangioblastomas are vascular tumours classified as WHO grade I, primarily found in the cerebellum and spinal cord [1-3]. They constitute approximately 2% of all intracranial tumours [1].



[Table/Fig-1]: a) Initial CT shows presence of hyperdense lesion in the left posterior parafalcine region with surrounding oedema (black arrow); b) Axial gradient echo MRI images showing blooming suggestive of haemorrhage (white arrow); c,d) Precontrast (c) and Postcontrast (d) images showing the lesion to be hyperintense on T1 weighted images peripherally suggestive of haemorrhage with no significant postcontrast enhancement (white arrow).



[Table/Fig-2]: a) CT done 4 weeks after the initial presentation shows mild reduction in the hyperdensity of the lesion; however, there is increase in the surrounding oedema with mild increase in the size of the lesion (black arrow); b) Axial gradient MRI images, showing mild reduction in blooming/haemorrhagic areas (white arrow); c,d) Precontrast (c) and Post-contrast (d) images showing the lesion to be hyperintense on T1 weighted images peripherally suggestive of haemorrhage with no significant postcontrast enhancement (white arrows).



[Table/Fig-3a,b]: Postoperative CT image showing complete resolution of the lesion with postoperative changes and oedema (white arrows).

Haemangioblastomas can occur sporadically or as a component neoplasm of von Hippel-Lindau disease. In the present case, there were no features indicative of von Hippel-Lindau disease; hence, this case represents a sporadic haemangioblastoma in a supratentorial location, which is extremely rare.

Due to their vascular nature, haemangioblastomas carry a risk of haemorrhage within the tumours [2]. This haemorrhage can occur either spontaneously, intraoperatively, or postoperatively [4]. In this case, the haemorrhage occurred spontaneously within the tumour, mimicking acute intraparenchymal haemorrhage. The calculated risk of spontaneous haemorrhage in haemangioblastomas is 0.0024 per person per year, with an average diameter of 2.3 to 3 cm [4]. In the present case, the tumour size was 4.5 cm. The risk of haemorrhage is influenced by the size of the tumour, as larger sizes are associated with increased blood flow. Increased blood flow can cause partial transmission of arterial pressure to the venous side, resulting in vascular vulnerability due to structural changes [3,4].

Proposed causes for haemorrhage in these tumours include haemorrhagic infarction resulting from vessel occlusion due to endothelial proliferation or tumour emboli, rupture of fragile vessels caused by direct invasion from tumour cells, rupture of vessels due to loss of perivascular support tissue, and rupture of fragile neovascular vessels [4]. Haemangioblastomas are least common in the supratentorial region, where they most frequently occur in the frontal lobe and the pituitary stalk; however, in this case, the tumour was located in the left parietal lobe [1].

In the literature reviewed by Gläsker S and Van Velthoven V, out of nine studies, only one documented a supratentorial haemangioblastoma, which was situated in the left fronto-temporal region; the remaining cases were in the spinal cord and cerebellum [4]. The treatment of choice for haemangioblastoma involves surgical en-bloc resection [5]. Radiosurgery ablation is an option for small, solid, and difficult-to-access lesions [5].

To conclude, large solid haemangioblastomas can cause spontaneous fatal haemorrhage, and they should be managed with this complication in mind. Supratentorial haemangioblastomas are extremely rare, and to the best of our knowledge, only one case of supratentorial haemangioblastoma with bleeding has been described previously [4].

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PARTICULARS OF CONTRIBUTORS:
1. Junior Resident, Department of Radiodiagnosis, SRM Medical College Hospital and Research Centre, SRM IST, Kattankulathur, Chengalpattu, Tamil Nadu, India.
2. Junior Resident, Department of Radiodiagnosis, SRM Medical College Hospital and Research Centre, SRM IST, Kattankulathur, Chengalpattu, Tamil Nadu, India.
3. Professor and Head, Department of Radiodiagnosis, SRM Medical College Hospital and Research Centre, SRM IST, Kattankulathur, Chengalpattu, Tamil Nadu, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Senthil Kumar Aiyappan,
Professor and Head, Department of Radiodiagnosis, SRM Medical College Hospital and Research Centre, Kattankulathur, Chengalpattu-603203, Tamil Nadu, India.
E-mail: asenthilkumarpgi@gmail.com

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