CASE REPORT

Cystic glioblastoma multiforme masquerading as a cerebral tuberculoma

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Accepted 3 October 2014

SUMMARY

Glioblastoma multiforme (GBM) is by far the most common and most aggressive malignant neoplasm of the primary brain tumours. It arises from the astrocytes and classified as WHO grade 4 astrocytoma. Diagnosis of GBM is sometimes difficult as radiological picture sometimes mimic with cerebral tuberculoma. In both the cases contrast-enhanced CT may show similar finding of a mass lesion with a hypodense centre surrounded by a ring of enhancement and any cyst if present. In the present case, a 45-year-old male patient presented with seizures and headache, a provisional diagnosis of tuberculoma was made on the basis of clinical and CT findings. However, on grounds of suspicion the patient was operated and fluid from the cyst was sent peroperatively for cytopathological examination which suggested the diagnosis of cystic GBM. This helped the surgeon to do maximum debulking of the tumour. Diagnosis was further confirmed by histopathology.

BACKGROUND

Radiological imaging has revolutionised treatment of intracranial space occupying lesions by providing a reasonable percentage of definite diagnosis based on the appearances of the lesion. However at times radiological diagnosis of a high-grade cystic glial lesions is difficult because the imaging presentation is varied and can be non-specific.^{1,2} Rarely solitary glial tumours may be indistinguishable from tuberculomas.³ It is prudent to differentiate both these entities as they are different therapeutically and prognostically. Hence a confirmatory diagnosis by pathological examination is mandatory.

In such cases usually a stereotactic biopsy or a craniotomy with tumour resection and histopathological confirmation is carried out for a definitive diagnosis. Cytological evaluation of brain cyst fluid is not considered a reliable means of diagnosing cystic glioblastoma multiforme (GBM). However a probable diagnosis of GBM can be suggested by demonstrating atypical or malignant glial cells along with necrosis peroperatively on cytocentrifuge smears by rapid Diff-Quik staining technique. This would enable the operating surgeon to plan further course of action, whether to resect out tumour completely or do maximum decompression surgery.

CASE PRESENTATION

A 42-year-old average built man presented with symptoms of persistent headache and seizures for past 4 months. CT of the brain showed a mass with a hypodense centre surrounded by a ring of

enhancement in the right temporoparietal region (figure 1) leading to a provisional diagnosis of cerebral tuberculoma. Antitubercular treatment was started. However, on grounds of suspicion the patient was operated for the same and smears from aspirated fluid were examined peroperatively by rapid Diff-Quik method. The cytological findings were highly suggestive of a high-grade malignancy, most likely GBM. Hence, Surgery was extended for maximum debulking of tumour and tissue was sent for histopathological examination further confirming the diagnosis of GBM.

INVESTIGATIONS

The aspirated fluid was centrifuged and prepared smears were examined peroperatively by rapid Diff-Quik method. Smears comprised of isolated atypical bizarre cells with hyperchromatic nuclei and prominent nucleoli along with some multinucleated cells and few degenerating cells against a necrotic background (figure 2A, B). The cytological findings were highly suggestive of a high-grade malignancy, most likely GBM. Tissue was sent for histopathological examination which revealed anaplastic cells having enlarged, highly pleomorphic and hyperchromatic nuclei with prominent nucleoli along with areas of necrosis and vascular proliferation with a high mitotic count (figure 3A, B) thus confirming the diagnosis of GBM.

Figure 1 Contrast-enhanced CT scan of the brain showing a mass with a hypodense centre surrounded by a ring of enhancement in the right temporoparietal region.

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To cite: Hasan M, Siddiqui B, Qadri S, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2014-206832

Figure 2 (A) Atypical and degenerating cells along with few multinucleated cells. The nuclei are hyperchromatic with prominent nucleoli (H&E $\times 400$). (B) Isolated bizarre cells with clusters of degenerating cells (H&E $\times 400$).

OUTCOME AND FOLLOW-UP

Postoperative period was uneventful. Currently, the patient is in follow-up and on antiepileptic medications. He is doing well 2 months after surgery.

DISCUSSION

GBM accounts for 12–15% of all intracranial tumours.⁴ GBM may either develop *de novo* or from a previous low-grade astrocytoma.⁵ The majority of glioblastomas (>90%) develop very rapidly with a short clinical history (usually <3 months), without clinical or histopathological evidence of a pre-existing, less malignant precursor lesion (primary or *de novo* glioblastoma). Despite progress in surgery, radiotherapy and chemotherapy of brain tumours, the overall survival of patients with glioblastoma remains extremely poor (less than 20% of patients survived more than 1 year and less than 3% lived longer than 3 years).^{6,7} Hence timely and definitive diagnosis is important for proper management of these cases.

Although for most of the cases GBM can be diagnosed reliably by radiological means (CT and MRI), rarely it may be very difficult to differentiate (especially cystic ones) from tuberculoma or pyogenic abscess. Brismar *et al*¹ had a large number of patients who were referred for surgery for brain tumours and were finally diagnosed as tuberculomas. In developing countries, it is justified in making a diagnosis of tuberculoma in patients with intracranial mass lesions.⁸ When a CT scan shows all features suggestive of a tuberculoma, a patient is usually put on antitubercular treatment. However, as in our case, when a

Figure 3 (A) Anaplastic cells along with areas of necrosis and vascular proliferation (H&E $\times 100$). (B) High power view showing malignant cells with pleomorphic, hyperchromatic nuclei and prominent nucleoli along with few tumour giant cells (H&E $\times 400$).

glioma masquerades as a tuberculoma, valuable time can be lost with antitubercular drugs. Hence timely and accurate diagnosis is mandatory in these cases. Rapid cytological assessment of cystic fluid preoperatively by Diff-Quik method in such cases may have an important role in differentiating the two lesions, as in tuberculoma, smears show only necrosis or rarely scattered epithelioid cells while in GBM atypical or malignant astrocytes may be seen along with necrosis hence differentiating the two.

In our case a probable diagnosis of GBM was suggested on cytological evaluation of the tumour cyst fluid preoperatively and it was further confirmed by histopathological examination.

Learning points

- Glioblastoma multiforme (GBM) is the commonest and most aggressive of the primary brain tumours hence, timely diagnosis and treatment are mandatory.
- Cystic GBM may be confused rarely on radiology with tuberculoma as both may show a mass lesion with hypodense centre surrounded by a ring of enhancement.
- Perioperative cytological examination of smears prepared from fluid aspirated from cysts by rapid Diff-Quik method may prove beneficial for immediate diagnosis in suspicious cases and appropriate patient management may be carried out.

This helped the surgeon to do maximum debulking surgery. Hence, we find it interesting to report here.

Contributors MH and SF made the diagnosis. BS and SQ searched the literature and prepared the manuscript.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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