Case Report

Gemistocytic Glioblastomas: Review of two Cases

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ABSTRACT

We report two cases of de novo Gemistocytic glioblastomas. In case one, a 35 year male presented with features of raised intracranial pressure and rapid neurological deterioration. In case 2; a 73 year old male presented with rapid neurological deterioration and focal neurological deficits. In both cases imaging findings were suggestive of high grade malignancy involving the brain. This was confirmed as gemistocytic glioblastoma after surgical excision. Gemistocytic cells are large astrocytes with plump processes and massive accumulation of glial fibrillary acidic protein (gemistocytes). Their accumulation within astrocytomas may be due to bcl-2-mediated escape from apoptosis. In literature, exact incidence of these types of lesions is not known and it needs further evaluation.

Key words: Gemistocytic glioblastomas, Gemistocytes, Glioblasotma

Introduction

Glioblastoma (WHO Grade IV) is the most frequent and malignant type of human brain tumor, occurring at an incidence of two to three new cases per 100,000 population annually for most European and North American countries (1). Despite progress in surgical and adjuvant therapy, the mean survival of patients with this neoplasm is still less than one year (2, 3). Glioblastomas may develop rapidly, with a short clinical history de novo (primary glioblastoma), or more slowly, through progression from low-grade (WHO Grade II) or anaplastic (WHO Grade III) astrocytomas (secondary glioblastoma) (4, 5). In this paper we report two cases of de novo gemistocytic glioblastomas and review the relevant literature.

Case reports

Case 1

This 35-year-old male patient presented with progressively increasing headache of four months duration associated with vomiting and blurring of vision for last 15 days. General and systemic examination was normal. Neurological examination was normal except bilateral papilloedema. CT scan showed a contrast enhancing left frontal mass lesion (Fig.1). The tumor was almost entirely removed surgically. Histological examination revealed the presence of a glioblastoma with gemistocytes and areas of extensive necrosis (Fig. 2). After partial resection of the glioblastoma, the patient received whole brain radiation therapy with a boost on tumor bed and margin. The patient referred after 13 months after

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deterioration and a massive recurrence of the lesion
however did not do well and expired.

**Fig. 1:** CT scan of case 1 showing mixed density
lesion involving left frontal lobe with mass effect (left),
lesion was enhancing after contrast administration
(right).

**Fig. 2:** Photomicrographs of case 1 showing gem-
istocytic glioblastoma. (H&E staining ×100)

**Case 2**

This 73 -year-old male patient presented with rapi-
dly progressive left sided hemiplegia of seven days
duration and altered sensorium of three days duration.
General and systemic examination was normal.
Neurologically he was in altered sensorium and had
grade I/IV weakness in left upper and lower limbs with
increased tone and extensor plantar. CT scan showed
thick walled contrast enhancing cystic lesion. A right
parietal craniotomy was performed and tumor was
sub-totally removed. Histology showed glioblastoma
(WHO Grade IV) with presence of gemistocytes and
areas of necrosis. Subsequently the patient received
cranial radiation therapy. The patient present after
15 months after completion of the radiotherapy with
neurological deterioration and a massive recurrence
of the lesion however did not do well and expired.

**Discussion**

Gemistocytic cells are large astrocytes with plump
processes and massive accumulation of glial fibrillary
acidic protein (gemistocytes) (6). Their accumulation
within astrocytomas may be due to bel-2-mediated
escape from apoptosis (7). Gemistocytes lack
proliferative activity possibly indicating terminal
differentiation (6-8). Literature shows that low-
grade astrocytomas with a significant fraction of
gemistocytes progress more rapidly and typically
carry a TP53 mutations (6) and p53 mutation (7).
Presence of gemistocytic morphology should be
considered as evidence of a higher grade astrocytoma
(9). As in present case even after almost complete
removal of the lesions followed by radiotherapy both
the patients had massive recurrence and succumbed
to it. The biological basis of unfavorable prognosis
in gemistocytic astrocytomas is unclear, since
gemistocytes themselves have low proliferative
activity, even if present in anaplastic astrocytomas
or glioblastomas (6). It has been suggested that the
proportion of gemistocytes does not itself affect
prognosis (10). Recent reports question the role
of gemistocytes as a prognostic factor in diffuse
astrocytomas (11). It has been emphasized that there
is still a need for studies with sufficient numbers of
well-matched gemistocytic and non-gemistocytic
astrocytic neoplasms to decide whether upgrading
a tumor with ‘significant’ number of gemistocytes
is justifiable (9). Present cases showed the presence
of gemistocytes in denovo glioblastoma. In literature
exact incidence of these types of lesions is not known
and it needs further evaluation.

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