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Multifocal Glioblastoma: A Case Report with Review of Literature.

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ABSTRACT

Glioblastoma multiforme is an aggressive astrocytic tumour with poor prognosis. Multifocal glioblastomas are uncommon lesions which can mimic secondaries,but treatment of these two disease entities is considerably different. Histopathology and immunohistochemistry are imperative for arriving at the correct diagnosis and planning the mangement. Here we present a case of multifocal glioblastoma, with review of literature.

Keywords: Glioblastoma multiforme, multifocal, secondaries, histopathology, immunohistochemistry.

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INTRODUCTION

Glioblastoma multiforme is the most aggressive form of glioma, with poor prognosis, which usually presents as a solitary lesion. Multicentric gliomas are uncommon and have been previously reported at various incidences from 2.3 to 9.1% by various authors [1]. The clinical presentation and radiographic appearance of multicentric gliomas can mimic metastasis and other lesions radiographically; however the treatment of these two disease entities is considerably different [2]. Also, it is difficult to differentiate neuroradiologically among gliomas, lymphomas, and other malignant intracranial malignancies [3]. Hence histopathology is essential, not only for arriving at the correct diagnosis, but also for planning the treatment and determining the prognosis. Here we present a case of multicentric glioblastoma which was diagnosed as secondaries in imaging, but histopathology turned out to be Glioblastoma multiforme. Immunohistochemistry helped in confirming the diagnosis.

Case Presentation

A 45 year old male presented with history of seizures for 4 years. CT scan showed 2 hypodense lesions separated by a distance of approximately 1.5 cm in the left parietal lobe and differential diagnoses of tuberculoma and secondaries were given. Intra-operative squash preparation showed a cellular smear composed of astrocytes, pleomorphic large bizarre cells, spindle cells and tumour giant cells (Figure-1). A preliminary diagnosis of primary CNS tumour - Glioblastoma was offered. H&E stained sections of the resected tumour showed a cellular neoplasm composed of pleomorphic oval to spindle cells with hyperchromatic nuclei, multinucleated giant cells, gemistocytes, mitotic figures and proliferating capillaries surrounding areas of necrosis in a fibrillary background (Figure–2,3,4). The Final Diagnosis was Glioblastoma multiforme. Immunohistochemistry with GFAP showed diffuse positivity (Figure – 5) which confirmed the diagnosis.

Figure 1: Squash preparation showing high cellularity with pleomorphic bizarre cells, spindle cells (H&E x400)

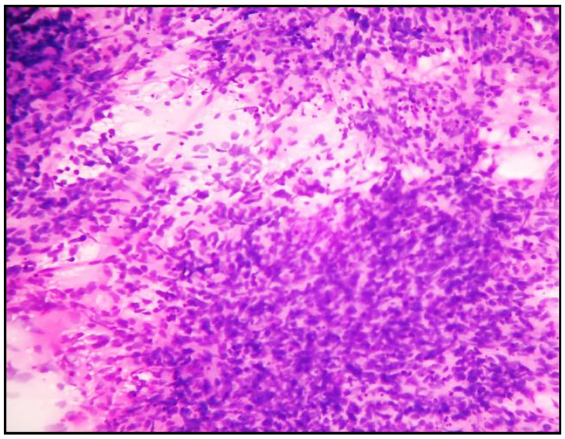

Figure 2: Pleomorphic tumour cells, multinucleated tumour giant cells and gemistocytes (H&E x400)

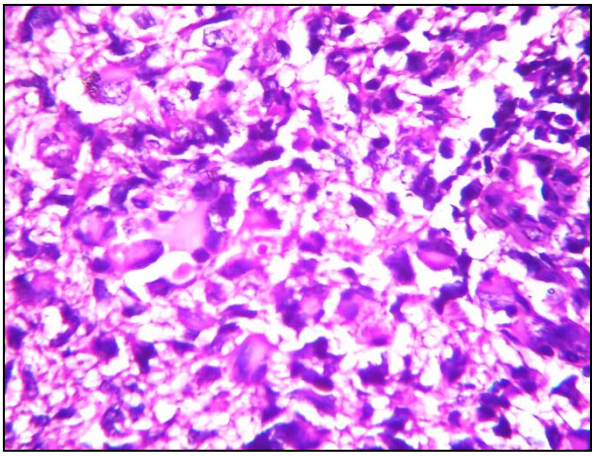

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Figure 3 : Proliferating capillaries with endothelial hyperplasia (H&E x100)

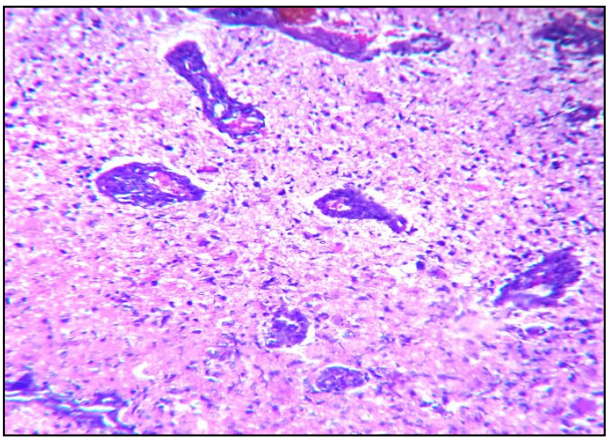


Figure 4: Tumour cells surrounding areas of necrosis (H&E x100)

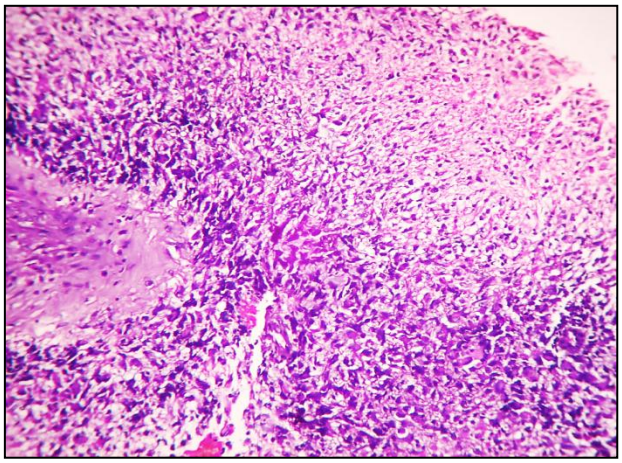
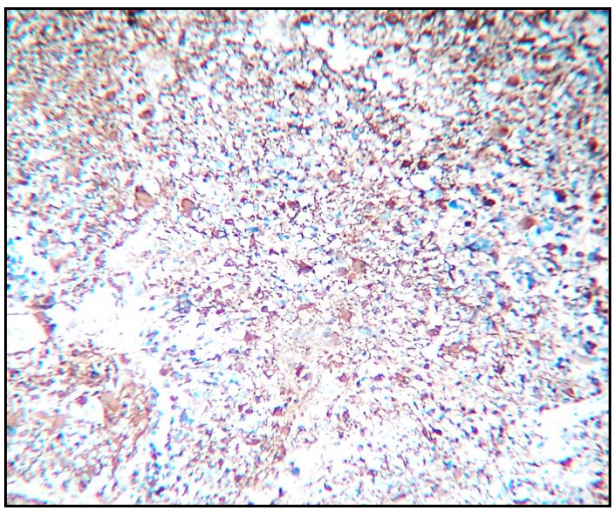


Figure 5 : Immunohistochemistry – Tumour cells showing diffuse GFAP positivity (x40)



DISCUSSION

Multicentric gliomas are fascinating lesions of the brain. They have a poor prognosis despite all treatment modalities [4]. These lesions can be divided into two groups multicentric and multifocal. Multifocal gliomas result from dissemination or growth by an established route, spread via commissural or other pathways, (i.e. corpus callosum, fornix, internal capsule, or massa intermedia), or spread via cerebrospinal

fluid channels or local metastases [5]. Multi- centric gliomas are widely separated lesions in different lobes or hemispheres. These can also be separated by time of occurrence [5]. Though multicentric gliomas can mimic metastatic diseases, the treatment is considerably different [2,5-7].

The incidence of multicentric gliomas is still a matter of debate. Barnard reported a post mortem series of 241gliomas, out of which multifocal tumors accounted for 2.9% [5]. Russel and Rubinstein's reported a rate of 4.5% [8], in contrary to 9% by Djalilian [9]. Many theories exist on the pathogenesis of these tumors. Zülch suggested that the multicentric lesions represent metastasis from a primary focus via an unknown pathway [10]. Willis suggested a two-step process - a large area of brain parenchyma undergoes neoplastic transformation, followed by various rates of tumor proliferation giving rise to separate lesions [11], whereas, Chadduck proposed tumor dissemination via CSF pathway [12].

Multifocal gliomas can be classified into four main categories - diffuse, multiple, multicentric and multiple-organ [13,14]. Djalilian suggested that these tumors can be either synchronous or metachronous, and that the metachronous lesions could be dissemination of tumor through the CSF pathways, radiation-induced tumors, radiation necrosis, or a new tumor foci [9]. Sundaresan observed that metachronous lesions occur more frequently than synchronous lesions [7].

The histopathological features of multifocal GBM include nuclear and cellular atypia and pleomorphism, dedifferentiation, mitotic activity, increased cellularity, and endothelial proliferation [15]. Management of patients with multifocal gliomas is controversial. Surgical intervention and tumor decompression has a significant impact on longer and better survival and also facilitates histopathological analysis and grading of tumor [2,12]. Some authors recommend biopsy first, believing that extensive resection can increase the risk of haemorrhage and neurological deficit without any influence on the survival [16]. Though the prognosis of glioblastomas is unfavorable, it is emphasized that the diagnosis of multifocal glioblastoma leads to a more aggressive therapy, and may result in longer survival [2,13].

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