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Original Research Paper

Pathology

A STUDY ON A CASE OF ASTROCYTOMA WITH MICROSCOPIC CALCIFICATIONS (PSAMMOMA BODIES)

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ABSTRACT This paper presents the case of a 46 years old male patient with a history of generalized tonic –clonic seizure, progressive loss of memory and diminished vision induced by densely calcified intra-axial tumor located at the left temporo-perietal lobe. The tumor exhibited focal areas of calcification with minimal cytological atypia. The final diagnosis was that of an intracerebral low grade astrocytoma.

KEYWORDS : low grade astrocytoma, seizure, tumor, cytological atypia.

INTRODUCTION

Astrocytoma is a primary brain tumor, accounts for 15% of all adult brain gliomas. Incidence rate is highest among young adults, with a male predominance. Most common clinical menifestations are seizures, progressive loss of vision and dementia, depending upon the area of involvement in brain.

Astrocytoma is a CNS neoplasm in which the predominant cell type is derived from astrocytes. In adults, astrocytoma most often occur in cerebral hemispheres.

Calcification is a subtle and infrequent finding in astrocytoma. Although calcification is more commonly regarded as a feature of benign or slow- growing tumors. Commonly calcified brain tumors include oligodendroglioma, low grade astrocytoma, craniopharyngioma, meningioma, pineal gland tumors and ependymoma. CT images of low grade astrocytoma usually show a low –density , intra axial lesion, with or without minor calcifications. MRI images show a low T1 signal and a high T2 signal without obvious enhancements. Low grade astrocytoma are the most common glial neoplasms that exhibit calcifications.

The etiology of intracranial calcifications include physiological, post-traumatic and dystrophic causes such as congenital disorders, vascular disorders, metabolic disorders and tumors. Some intracranial calcifications may be critical to the diagnosis of the underlying pathology. Some idiopathic brain calcifications have been reported without any pathological changes. In our patient, neoplastic process rather than benign physiological processes could have caused the calcified intra-axial calcifications.

TABLE – 1 Distribution of gliomas in adult and pediatric population

Histologic Subtype	Adult group (%)	Pediatric group(%)
Pilocytic Astrocytoma	6.1	44
Subependymal Astrocytoma	0.3	2.1
Diffuse Astrocytoma	1.5	0.3
Pleomorphic Xanthoastrocytoma	0.2	1.2
Oligodendroglioma	3.5	0.6
Oligoastrocytoma	2.5	0.9
Anaplastic Astrocytoma	7.6	4.8
Anaplastic Oligodendroglioma	24.5	1.8
Anaplastic Oligoastrocytoma	9.2	1.2
Glioblastoma	38	12
Ependymoma	6.7	31

In the present study, a previously healthy 46 year old man came to the surgery out-patient department with acute onset of generalized tonic-clonic seizure. There was also progressive loss of vision and dementia since few months, as revealed by history. Neurological examination result showed no abnormalities. Bain CT imaging showed a calcified lesion in the left temporo-perietal region. MRI revealed a high grade glioma at left temporo-perietal region exerting mass effect with compression of left posterior cerebral artery.

The patient underwent a total surgical resection. The tumor was adherent to the surrounding temporal lobe and was hard, but no prior hemorrhage was found. The pathological analysis revealed tumor fragments with areas of calcification. The tumor was composed of vague fascicles of spindle cells and had minimal cytological atypia. Neither mitotic activity was noted nor necrosis was found. Immunohistochemical studies revealed positive findings for glial fibrillary acidic protein, suggesting the glial nature of these tumor cells. The tumor cells in this case did not have the characteristic honeycomb appearance of an oligodendroglioma (monomorphic cells with uniform round nuclei and perinuclear halo).

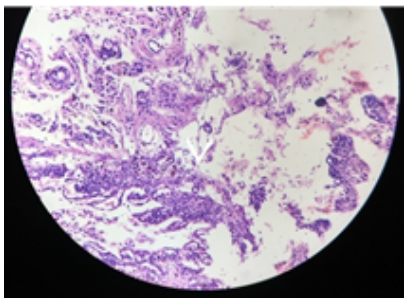

Figure 1 :section showing areas of calcification(low power view 10X)

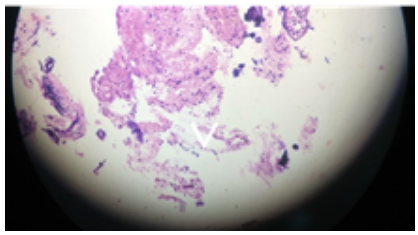

Figure 2 :section showing areas of calcification(20X)

The distinct feature of this case was that the low grade astrocytoma had calcifications. According to a literature review, calcification may be in the form of calcospherites or of deposits within the microvasculature of the neoplasm. Calcification can occur anywhere within the neoplasm, but it is specially common when the tumor has infiltrated into the cortical gray matter. There are four morphological types of glial pathological calcification may be distinguished on a plane skull X-Ray, namely localized, diffused, multiple scattered and multiple symmetric. Theories regarding tumor calcification have been proposed. Mukade et al suggested that intratumoral bleeding and secondary degeneration of tumor cells may initiate dystrophic calcification. Ke et al stated that tumor calcification may be caused by a secondary ischaemic effect induced by tumor compression.

Currently, early radical surgical excision is the preferred treatment for low grade astrocytomas, because the procedure has been increasingly correlated with improved outcome, especially in young adults and localized lesions. Jakola et al reported that the biopsy and watchful waiting groups tend to have more malignant transformations than a resection group, within 10 years. Early surgery with radical resection is still preffered because low grade astrocytoma have a risk of malignant change.

CONCLUSIONS

We can conclude that possibility of a low grade astrocytoma must be considered among patients with calcified intra axial lesions, regardless of whether they are macroscopic or microscopic. Early radical resection is preferred because the process can be safely performed without morbidities and decrease risk of malignant changes.

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