Lipomas of The Corpus Callosum A Report of Four Cases

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Abstract : Lipomas of the corpus callosum are rare congenital conditions. These lesions are often asymptomatic but may present as epilepsy, hemiplegia , dementia or headache. Computerized tomography and magnetic resonance imaging make the diagnosis of lipomas feasible at any site of the intracranial space, because of very low density attenuation values on computerized tomography and the short T1 and T2 on magnetic resonance. A direct surgical approach is very rarely necessary in these lesions. Four cases with lipoma of the corpus callosum diagnosed by computed tomography are presented and the literature is reviewed. Basic diagnostic considerations and therapeutic options are discussed.

Key Words : Computerized tomography, Corpus callosum, Lipoma, Magnetic resonance imaging.

INTRODUCTION

Lipomas occur in most parts of the body, but intracranial lipomas, which are extremely rare, are developmental in origin. Intracranial lipomas mainly occur in the region of the corpus callosum, particularly in the rostrum, as first described by Rokitansky in a case of necropsy [Cited in (2)]. Although 25 % to 30 % of intracranial lipomas are located in the corpus callosum, they make up 5 % of all corpus callosum tumours (17). Callosal lipomas may be frequently associated with other disturbances including absence of corpus callosum, myelomeningocele and spina bifida (1). Although computerized tomography (CT) has been of great help in the diagnosis of these lesions (20) ,recently magnetic resonance imaging (MRI) has provided highly visible images of the corpus callosum , and therefore is being used for the diagnosis of callosal lipomas and other diseases of this structure (5,6).

Neurological manifestations of lipomas are not specific and consist of severe headache, disturbances in mention, seizures and dissociation in behaviour (9,19). Lipoma of the corpus callosum does not lend itself to surgical cure in cases with seizures since anticonvulsant therapy usually results in remission of the seizures.

We report in this paper four cases with corpus callosum lipomas and discuss the anatomoclinical features, histological characteristics, the radiological diagnosis and therapeutic modalities of these lesions.

CASE REPORTS

Case I

This 7-month-old boy had generalized seizures for 4 weeks before admission. There was no neurological deficit. A CT scan showed multiple low-density tumours of the corpus callosum (-78 H.U) lying within both lateral ventricles along with peripheral calcification (+ 123 H.U). CT scan with attenuation measurements established the diagnosis of lipoma of the corpus callosum in combination with lipomas of the choroid plexus of both lateral ventricles (Fig.1). No operation was performed.

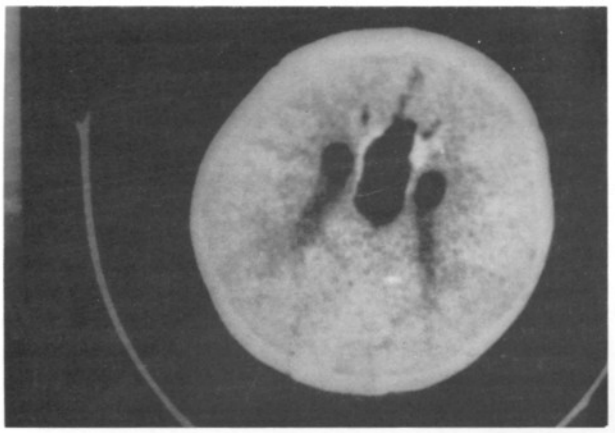

Fig. 1 : Case I. Combination of lipoma of the corpus callosum and lipomas of the choroid plexus of both lateral ventricles.

Case II

This 60 year old man had complained of headache for one year. A CT scan showed a hypodense lesion (-38 H.U) beginning from the corpus callosum and descending into the right ambient cistern with agenesis of the corpus callosum (Fig.2). No operation was contemplated.

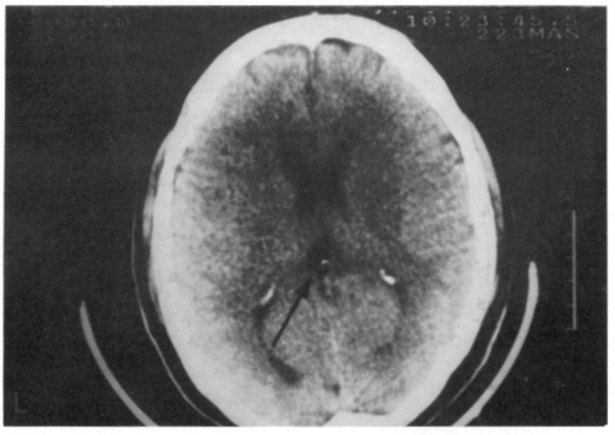

Fig. 2 : Case II. Lipoma of the corpus callosum descending to the ambient cisterm.

Case III

This 36-year-old man had a one year history of occipital headache. Neurological examination revealed no abnormality. CT scan showed regular low density (-55 H. U.) involving the corpus callosum from the genu through the body into the splenium (Fig.3). This lesion was presumed to be a lipoma due to attenuation measurements and no operation was performed.

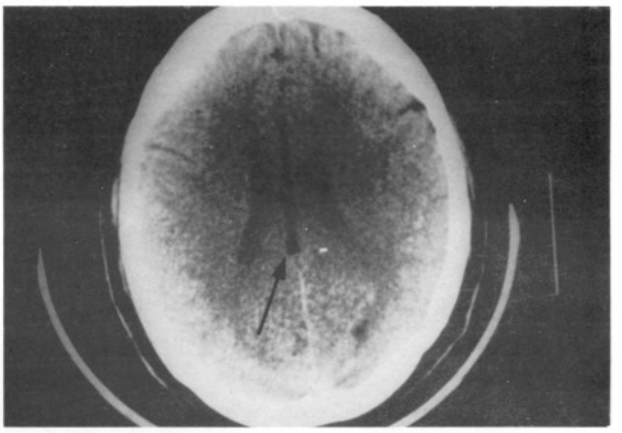

Fig. 3 : Case III. Axial CT scan showing a low hypodense lesion involving the corpus callosum from genu through the body into the splenium.

Case IV

This 3-year-old boy suddenly complained of headache, nausea and vomiting for two days before admission and seizures beginning one year ago. A CT scan revealed a lobulated mass of extremely low density (-90 to -110 H.U.) in the corpus callosum (Fig.4). The seizures were controlled with medication and no operation was contemplated.

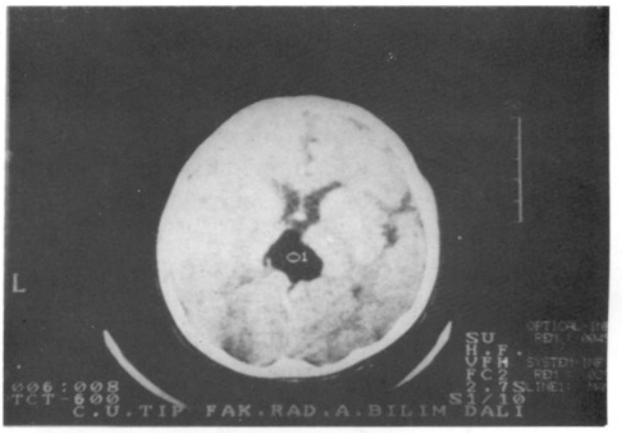

Fig. 4 : Case IV. Large lobulated lipoma in the corpus callosum.

DISCUSSION

Most authors have hypothesized that intracranial lipomas originate from fat cells present in the leptomeninges or primitive pial cells due to maldevelopment (15). This theory is supported by Mattern et al (13) since the common location of lipomas in some cisternal space which has a much amount of leptomeninges and these regions correspond to the site of flexion of neural tube.

Intracranial lipomas are most frequently located in the region of corpus callosum since they often arise from the midline cerebral cisterns, particularly the callosal cistern (3,18). Other common locations are the region of the ambient cistern, the tuber cinereum and th quadrigeminal plate (7,10). Lipomas of the lateral cisterns are extremely rare and a few cases have been described in the cerebellopontine angle (8,16) or in the sylvian fissure (4,11).

In the pre-CT era, intracranial lipomas were rarely encountered . Peripheral calcification of lipoma in plain skull x-rays are reported to be diagnostic (18), but were nonspecific in all our cases. This entity was more often diagnosed during the life time of the patient by the clinicians with the advent of CT scanning. Recently MRI provides highly visible images of the intracranial lipoma particularly for the callosal lipomas (1,5). The CT characteristics of lipomas of the corpus callosum were first described by New and Scott (14) in 1975. A homogeneous low density area with attenuation values between -60 and -200 H.U, no contrast enhancement, regular margins and often linear calcifications in the surrounding area are the main characteristics of this lesion on CT scan. Although the CT attenuation values of fatty tissue ranged between -38 and -110 H.U. in our series, density of the lesion in the second and third cases which was -38 and -55 H.U. respectively, was considered to be due to the partial volume effect of peripheral neural tissue around the tumour, as reported by Kazner (12). This partial volume effect generally occurs in lipomas smaller than 25-30 mm in diameter.

Intracranial lipomas commonly show short T1 and T2 with high intensity regions in T1-weighted and a decrease in T2-weighted images. MRI is a procedure of choice in the evaluation of corpus callosum lipomas for its capacity to obtain direct coronal images without reconstruction (1,5). Furthermore MR signals for lipomas are specific and usually allow a correct diagnosis.

In the differential diagnosis of these lesions, lesions with a fatty component, such as epidermoid cysts, dermoid cysts, teratomas, myelolipomas, angiolipomas should be considered. Dermoid cysts usually present as less homogeneous lesions on CT (12) and MRI (15) since they tend to show calcification and contain hairs in the cyst. Epidermoid cysts contain a high degree of keratin crystals and usally show low attenuation values mimicking those of CSF on CT scan. Finally, teratomas which contain various type of tissue such as adipose, cartilage, muscle and bone would therefore vary in both CT attenuation and MRI relaxation parameters.

Lipomas of choroid plexus combined with lipoma of the corpus callosum similar to the first case in our series were frequently mentioned in the early neuropathological literature (12).

Although most intracranial lipomas are asymptomatic and are diagnosed during neuroradiological investigations, some patients have neurological symptoms. Callosal lipomas show clinical presentation in almost half of the cases. In symptomatic cases, the most common symptom is epileptic seizure (50-60 %) which can be attributed to interhemispheric disconnection (9). Epilepsy observed in the first and fourth cases in our series was probably due to such a disconnection. Some patients may show mental deficiency and slightly psychic retardation due to associated malformations such as callosal agenesis or hemispheric atrophy. The occurrence of focal neurological signs is exceptional and limited to some callosal lipomas with hemiparesis.

A direct surgical approach is rarely indicated in callosal lipomas, since they are slow-growing lesions and rarely reach a size sufficient to cause a mass effect. Complete removal of the lesion in this location is almost impossible because of the firm adhesions between the collagenous capsule and the brain and the high vascularity of the tumour. Furthermore, the close relationship of the anterior cerebral arteries to the lesion is another important difficulty for surgery. Surgical management of hydrocephalus may be necessary if pressure symptoms or progressive dementia are present.

We believe that the surgical indications for removal of a lipoma of the corpus callosum should be carefully and cautiously considered since it is a benign, slow growing lesion, most patients are asymptomatic and epilepsy ,which is the commonest symptom that can not be cured by surgery.

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