MENINGIOMAS WITH CYST FORMATION

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SUMMARY :

5 cases of cystic meningioma are presented. In three the cysts were in the subarachnoid location and in the other two both the cysts and the tumors were intramedullary. Correct preoperative diagnosis was made in only two cases, while intraoperative diagnosis on the basis of the macroscopic appearance of the tumor was found to be meningioma in three cases. Two intraparencymal cystic meningiomas were diagnosed only after histopathological examination.

KEY WORDS :

Computed tomogrophy, cyst, glioma, meningioma.

INTRODUCTION

Meningiomas with cyst formation are very rare and may simulate gliomas or metastatic tumors (1, 3, 10, 14). Although since the advent of computed tomography cases or larger series of cystic meningioma have been reported with increasing frequency, incorrect preoperative diagnosis has not been eliminated entirely (1, 3, 5, 7, 10, 14).

In this series five cases of cystic meningioma treated at Hacettepe University, Department of Neurosurgery in one year are presented.

METHODS :

Thirty-six cases of intracranial meningioma were encountered between December 1986 and December 1987 at Hacettepe University Department of Neurosurgery, five of which were cystic meningioma. These five cases were analysed for clinical manifestations, investigative procedures and preoperative and intraoperative diagnosis.

SUMMARY OF CASES :

Clinical features, radiological investigations, preoperative and intraoperative diagnosis and histology of the cases are summarized in Table I. Four of the five patients were female. Ages ranged from 14 to 55 withan average age 37. Four patients presented with seizures, but on admission hemiparesia was also noted in all. Duration of symptoms varied from 6 months to 4 years. Skull radiograms showed increased intracranial pressure in one patient (case I) and the others were normal.

TABLE : I

Case	Age/Sex	Location	Clinical History	CT	Preop. Diag.	Histology
1	14/F	It Temporoparietal	4 years seizures	cyst, enhancing nodule	glioma, hemangioblastoma	angioblastoma meningioma
2	39/F	It temporal	2 years seizures	solid tumor, cyst	cystic meningioma	meningothelial meningioma
3	55/F	rt parietal	2 years seizures	cyst, isodence nodule	glioma	meningothelial meningioma
4	38/F	It frontal	6 months seizures	solid tumor, cyst	oligodendroglioma	fibroblastic meningioma
5	41/F	It parietal	I years hemiparesia	enhancing nodule, cyst	glioma	fibroblastic meningioma

F : Female, M: Male, It: Left, rt: Right

CT scan was performed in all cases, and showed cysts associated with enhancing nodules in two (Fig.1,2,3) and solid tumor with peripheral cyst in

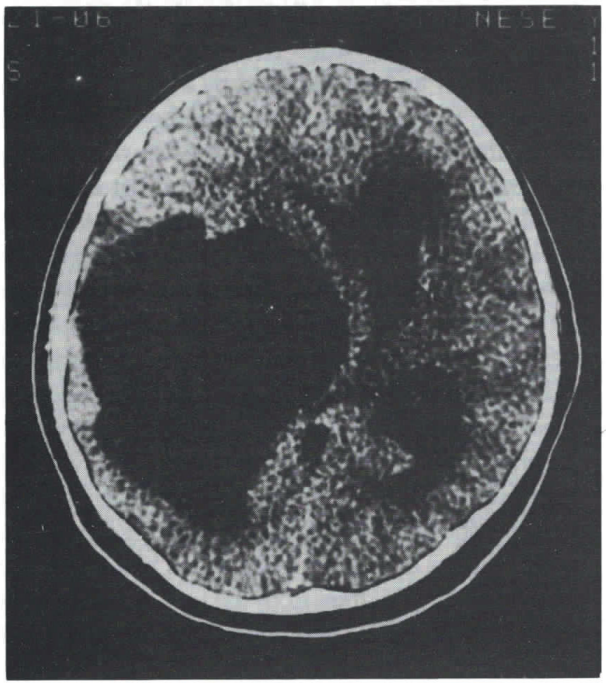

Fig.1 : (Case I) Plain CT scan shows a large temporoparietal cyst.

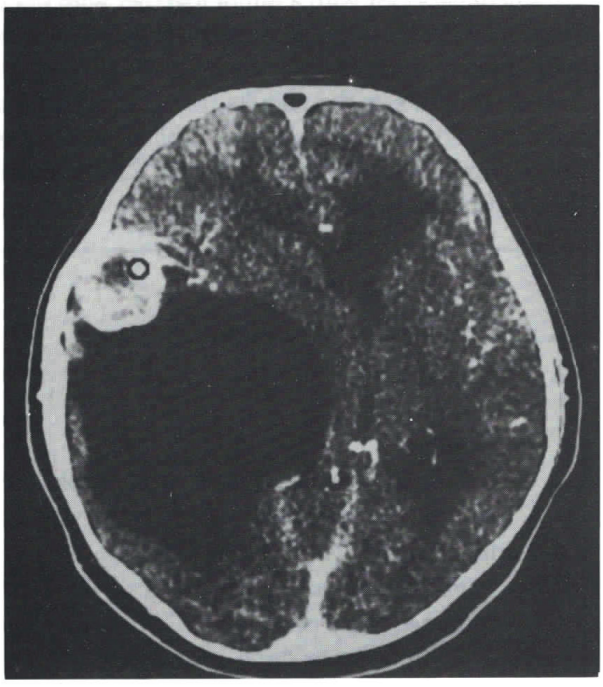

Fig.2 : (Case I) Postcontrast CT scan showing a contrast enhancing subcortical nodule.

two (Fig.4). In one case a cyst and isodense nonenhancing nodule was seen on CT (Fig.5) Location of the lesion was parietal in two cases, frontal in one, temporal in one and temporoparietal in one.

Angiography was performed in two cases (Case 2,5) and showed an avascular mass in case 5 and

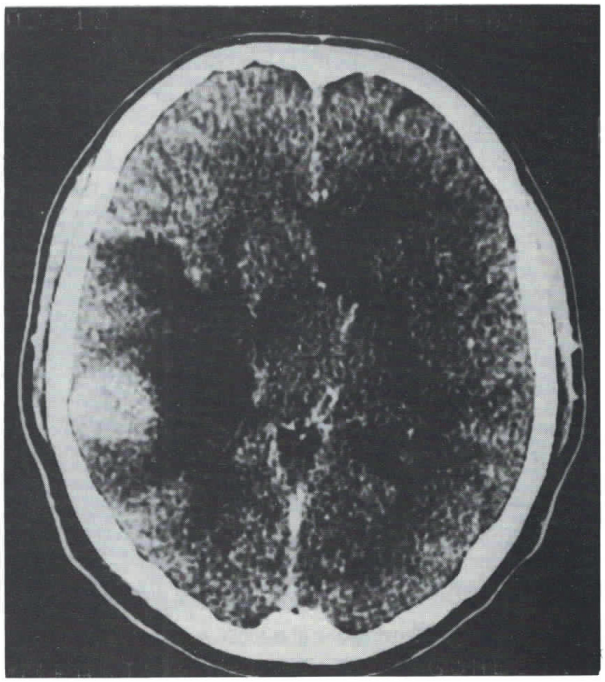

Fig.3 : (Case 5) Postcontrast CT scan reveals a parietal tumor with a peritumoral cyst.

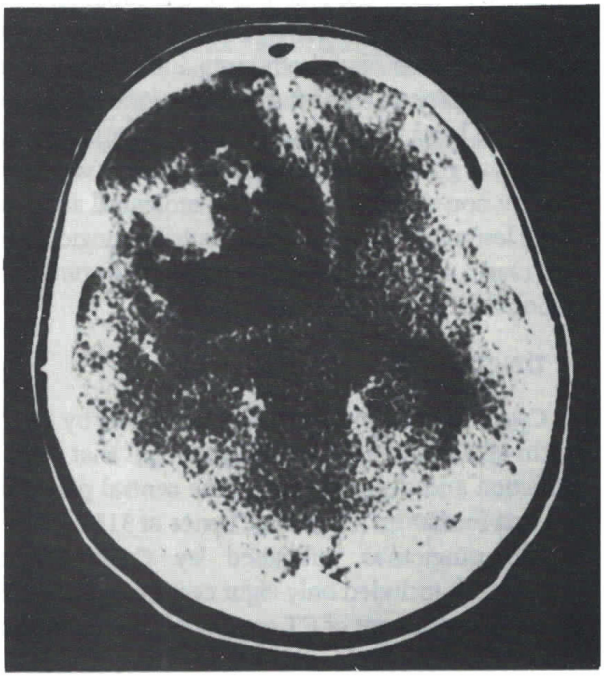

Fig.4 : (Case 4) A frontal solid tumor with peritumoral cyst is shown on postcontrast CT scan.

tumor blush fed via the external carotid artery in case 2.

A preoperative diagnosis of glioma was made in in three cases and of meningioma in one. In case I the preoperative diagnosis was glioma or hemangioblastoma. Intraoperative diagnosis was glioma in two cases (Case 1.5) and cystic meningioma in the others. At operation, xanthochromic cyst was found

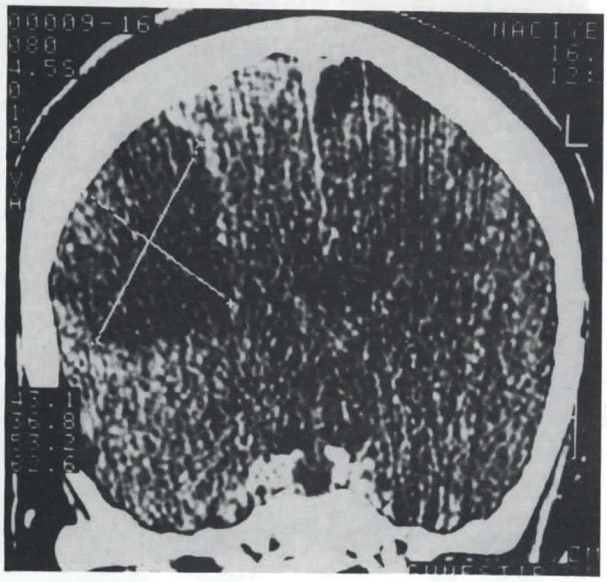

Fig.5 : (Case 3) Postcontrast CT scan shows a parietal cystic lesion with a small isodense part.

all cases, in three the cyst was in the subarachnoid location and the tumors were attached to the dura. In the other two cases both cysts and tumors were intramedullary. In these cases intraoperative diagnosis on the basis of macroscopic examination proved that it was glioma and the walls of the cyst were formed by non-neoplastic tissues. Histological analysis of the lesions disclosed a fibroblastic meningioma in two cases, meningothelial meningioma in two and angioblastic meningioma in one case.

DISCUSSION

Cystic meningioma was first described by Bouchot in 1928 (4). In 1932 Penfield thought that tumor infarction and degeneration of the central part caused cyst formation (II). A large series of 313 intracranial meningiomas published by Cushing and Eishenhardt included only eight cystic meningiomas (6). After the advent of CT scan cystic meningiomas have been described with increased frequency. We encountered 36 cases in our hospital in a year and five of them (14 %) were cystic. Probably this is the highest reported incidence of cystic meningioma.

Many etiological factors have been suggested to cause the formation of meningioma cysts (9, 10, 14). Secretory and degenerative changes can cause intratumoral cyst, peripheral cysts can result from a loculation of subarachnoid space, perfusion deficits, reactive gliosis, demiyelination, active secretion or white matter edema. Several authors have classified meningioma cysts according to their anatomical configuration. Rengechary et al. described two different types within and around the tumor (12). According to Naota et al. there are four types (9). In the first type the cyst is located centrally within the tumor. In the second, the cyst is within the tumor, but located at the periphery and also covered by a rim of microscopic tumor. In type 3 the cyst is peripheral but within the brain and brain tissues may lie between the tumor and the cyst. The fourth type of cyst is formed by a loculation of the subarachnoid space. However, two of our cases did not fit into this classification. Although the tumors were in the subcortical they were not adherent to the substance of the dura mater. These meningiomas are called intraparencymal meningiomas and considered to be variants of ectopic meningiomas. These tumors arise from the arachnoidal rests within the brain tissue. Such cystic meningiomas have been described by several authors (2,8). We suggest that a new classification of meningioma cyst can be considered because of the two cases which had a different anatomical configuration from the type 3 described by Naota et al. (Table 2) Different factors may play a major role in the formation of such a cyst. Intratumoral cysts are the rarest cystic lesions with meningioma. Intramedullary cyst with a tumor together with dural attachment is the well documented cystic lesion. Several authors thought that cyst formation was more frequent in children than adults (1, 10). In our series, only one of the five patients was a child. Female predominance, obvious in our population, has not been decribed by any other author.

TABLE : 2

A new classification of meningioma cysts:

A. Intratumoral cysts :
   - Central
   - Peripheral
   - Extramely peripheral (cyst with neoplastic cells in the cyst wall)

B. Peritumoral
   - Subarachnoid cysts
   - Intramedullary cysts
     - With a tumor dural attachment. (intraparencymal cystic meningioma)

C. Combination A and B.

Seizure was the most common symptom. Hemiparesia was also noted on admission in all our cases. In cystic meningioma, duration of the symtoms is longer than in glioma. The cyst is responsible for increased intracranial pressure rather than the tumor itself.

Angiography may be helpful in preoperative diagnosis of cystic meningioma, a tumor which is fed by the external carotid arteries can suggest a meningioma (2, 10). However, two intraparencymal meningioma cases without dural attachments had no external feeding arteries and angiography was not helpful.

On CT, cystic meningiomas can simulate gliomas or metastatic tumors. In our case 3 the tumor, due to microcystic cavities, was isodense and had no contrast enhancement, this appearance is rare (13). In conclusion, cystic meningioma should be considered in the diagnosis of all cystic mass on CT.

According to Dell et al. preoperative diagnosis of cystic meningioma had been made in only 65 % of the published cases (7). In our series the correct preoperative diagnosis was 40 % and intraoperatively 60 %. Two intraparencymal cystic meningiomas were diagnosed after histopathological examination. Therefore, when a cystic intraparenchymal tumor is encountered, meningioma should be considered in the intraoperative diagnosis but only a frozen section of the lesion can help to establish the correct diagnosis.

Although syncitial meningioma is the most common histological type encountered with cyst formation (10, 14), none of our patients had this type.

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