Malignant transformation of intracranial epidermoid cyst with leptomeningeal carcinomatosis : case report

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Abstract

Introduction : Although rare, the malignant degeneration of epidermoid cysts is well documented. Its occurrence with leptomeningeal dissemination and malignant cells in CSF is scarce. To the best of our knowledge only four cases have been reported.

Case report : The authors report the case of malignant transformation of an epidermoid cyst with leptomeningeal carcinomatosis (which simulates aseptic meningitis) in a 54 year-old woman. Changes in CSF and radiological features are not correlated with the clinical course. Despite improvement of both the lesions on the scan images and the malignant cells in the CSF under chemotherapy the patient died.

Conclusion : The differential diagnosis of malignant degeneration of epidermoid cyst, and leptomeningeal carcinomatosis are discussed. The diagnosis of malignant transformation should be retained when MRI (or CT scan) shows contrast enhancement at the epidermoid site, and malignant cells are detected in CSF. The prognosis is generally poor.

Key words : Epidermoid cyst ; malignant transformation ; leptomeningeal carcinomatosis.

Introduction

Intracranial epidermoid cysts are rare lesions, which represent less than 1% of intra-cranial tumours (8). They are generally benign, and their malignant transformation into squamous cell carcinoma (SCC) is rare (8, 13). Since the first report by ERNST in 1912 (7), fewer than 50 cases have been described, nearly all arising from a benign epidermoid cyst (8, 13), with only a few cases demonstrating malignant cells in cerebrospinal fluid (CSF) (3, 6).

This report describes a case of a malignant transformation in a temporal epidermoid cyst with leptomeningeal carcinomatosis (LC).

Case report

HISTORY AND EXAMINATION

A 54 year-old woman was first admitted with a 2-year history of gait disturbance and recent
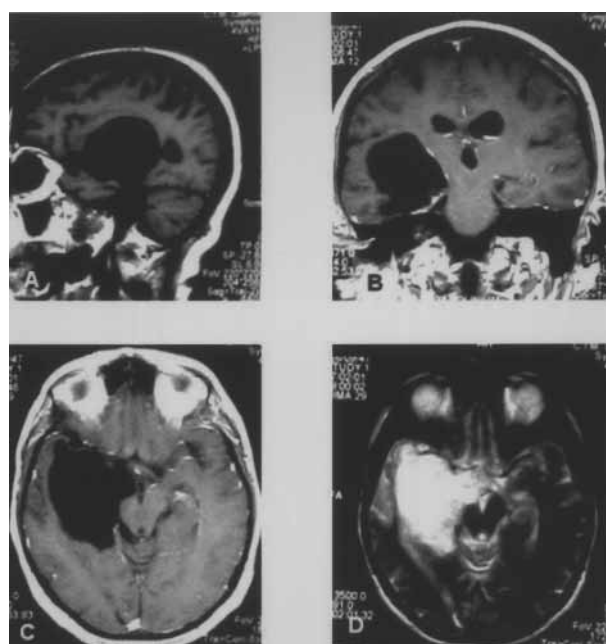

Fig. 1. — First MRI, shows the right temporal epidermoid cyst, which does not enhance after Gadolinium injection.

memory disturbances. The patient had no family or past medical history. Neurological examination revealed a left hemianopsia.

A brain MRI showed a right parieto-temporal cystic lesion (fig. 1).

OPERATION

A right temporal craniectomy was performed. A piecemeal removal of the cyst content, showing the characteristic features of epidermoid, was performed, and the temporal horn was opened. Much of the capsule was removed, except the part adherent to the ponto-mesencephalic junction.

POST-OPERATIVE COURSE

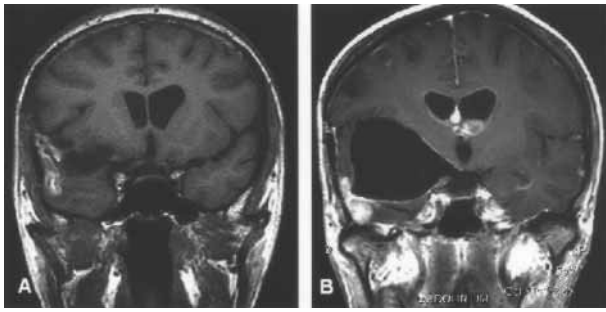Owing to her poor, though stable recovery, an MRI was performed seven months later. It showed

FIG. 2. — Second MRI reveals a spontaneous hyper density at the temporal lobe, which was diagnosed as a feature of aseptic meningitis (**A**). Third MRI with Gadolinium shows two enhanced nodules at the temporal lobe, and the lateral ventricle. The leptomeningeal carcinomatosis is evidenced by the enhancement of the ventricles and cyst walls, and the tumour has recurred (**B**).

FIG. 3. — CT scan with contrast, following the first chemotherapy protocol, shows the same radiological features of the malignant degeneration (**A**). CT scan with contrast reveals disappearance of the tumours, at the end of the second chemotherapy protocol (**B**).

tumour residue with a pathological hyper-signal which was diagnosed as features of aseptic meningitis (fig. 2A), although the patient showed neither signs of meningeal irritation, nor febrile course, and the lumbar puncture was normal.

Three months later, she appeared extremely ill with neuropsychological disorders. A new MRI showed multiple iso-intense lesions, which were homogeneously enhanced after contrast injection (fig. 2B).

A lumbar puncture demonstrated a reduced glucose level, increased protein content, and malignant cells on Papanicolaou and May-Grünwald-Giemsa (MGG) smear preparation. CSF cultures were negative for bacteria and fungi.

We did not attempt a surgical resection of the tumour owing to the patient's condition, tumour dissemination, and the cytological findings in CSF. Gynaecological, ENT, and gastro-enterological examination were normal, as were the thoraco-abdominal CT scan, bone scintigraphy, thyroid, and breast scan. The results of laboratory analyses for serum tumour markers were all negative. The diagnosis of SCC transformation of epidermoid cyst with LC was made.

TREATMENT

Intra thecal chemotherapy with METHOTREXATE was unsatisfactory (fig. 3A). She then underwent two cycles of intravenous cysplatine (100 mg) at day 1 and 21, associated with NAVELBINE (40 mg) once a week for 5 weeks. The CT scan at the end of the second protocol showed disappearance of the lesions (fig. 3B), and the CSF normalised. Despite the disappearance of the radiological and CSF anomalies, the patient continued to deteriorate and she died at home 16 months following the initial surgery. No autopsy was performed.
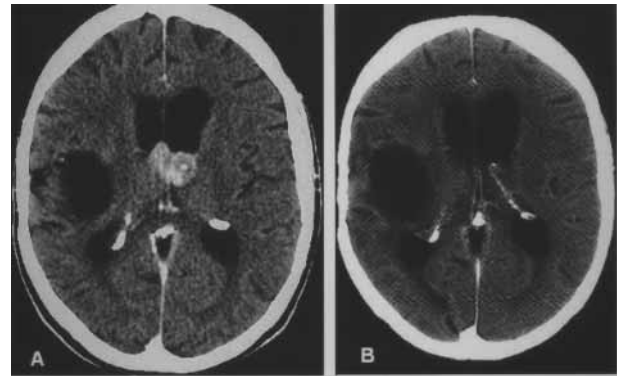
PATHOLOGICAL FINDINGS

Histological analysis of the first specimen showed a cyst containing waxy squames lined by a keratinised stratified squamous epithelium (fig. 4). The diagnosis was benign epidermoid cyst.

Cytological examination of the CSF revealed many large-sized tumour cells with few lymphocytes and histiocytes (fig. 5).

These cells do not express any of the following markers : cytokeratin markers (CK 5/6, CK7 and CK20), epithelial membrane antigen, carcinoembryonic antigen, vimentin, desmin, muscle specific actin, PAS, mucicarmine, GFAP, or S100 protein.

Discussion

Malignant change in the epithelial lining of epidermoid cysts has been described at the time of the first operation (18), in benign recurring lesions (1, 15), or on autopsy (7). Reports have concerned either dermoids (19), epithelial (17), or neurenteric cysts (16).

Malignant transformation of epidermoids with leptomeningeal dissemination and malignant cells in CSF is scarce. To our knowledge, only four cases have been reported (3, 6, 10, 12).

In the current case, the dye failed to penetrate the cell membranes but the microscopic features demonstrated their malignancy. It is well known that the use of monoclonal antibodies to stain CSF sediments offers improved sensitivity and specificity for the diagnosis of LC (4 + 9 + 20).

The progressive neurological deterioration and the development of an enhancing lesion occurring at the site of the epidermoid cyst suggested malignant transformation. The brief interval before malignant transformation may mean that the malignant component was already present at the time of the initial resection but was missed by the surgery
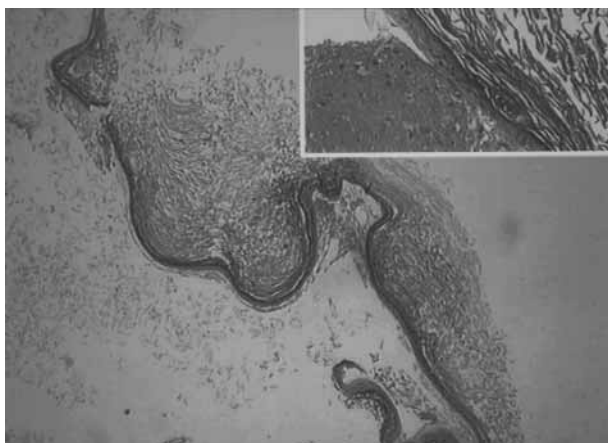
FIG. 4. — Cyst wall characterised by a keratinised stratified squamous epithelium (fig. 4), separated from the cerebral parenchyma via a thin fibrous base (Right inset fig. 4 ; HES 3 400).
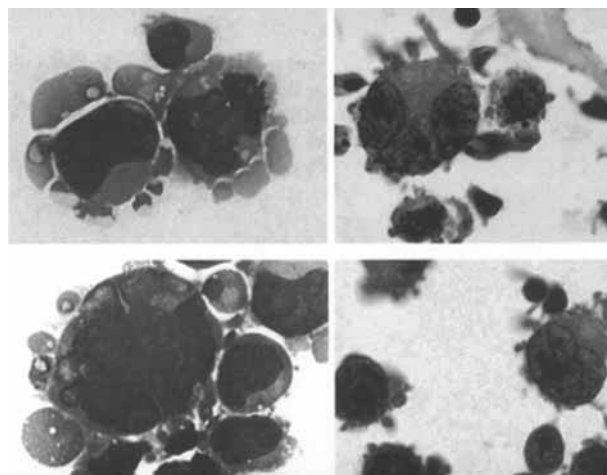

FIG. 5. — The tumour cells are isolated or grouped in little islets. They are characterised by a basophilic cytoplasm and large irregular and multi-lobulated nuclei, with one or more nucleoli (Papanicolaou and MGG stain 3 1000).

or the histopathological examination. Therefore post-operative outcome was probably involved in the dissemination of malignant cells into the ventricles and the leptomeninges. The exfoliated cells may have spread through the post-operative cavity and the open temporal horn.

We discounted the possibility of metastasis dissemination from an extra-cranial cancer owing to the clinical absence of any abnormality in other organs, and the normality of the radiological examinations.

A metastasis from an unknown primary is still debatable. The phenomenon of dissemination from a malignant to a benign tumour is well known, and meningioma seems to be the most regular host (2). Nevertheless, we are not aware of any metastasis occurring in epidermoid cysts.

A variety of methods have been used to diagnose LC, but demonstration of malignant cells in CSF is the diagnostic gold standard (11). Other differential diagnoses considered include the usual false positive cytology that arises in infectious, inflammatory processes (14), or in degenerating cells (20). These possibilities were excluded due to the malignant microscopic features of the cells and the radiological aspects.

While the presence of a cystic area limited by segments of benign squamous cell epithelium is required for the diagnosis of malignant transformation in a pre-existing epidermoid cyst (18), this diagnosis should also be retained when MRI (or CT scan) shows contrast enhancement at the epidermoid site and malignant cells are detected in CSF.

Epidermoid cysts with different signal intensity and occasional rim enhancement have also been described (5). However, malignant transformation should be considered when follow-up MRI (or CT scan) shows contrast enhancement at the surgical site, in any patient with a known benign cyst, who does not make the expected recovery, and/or whose condition deteriorates (8, 13, 15, 17, 19).

The majority of the previous cases were fatal in less than 12 months after the onset of symptoms, or establishment of the diagnosis of intracranial SCC (1). The review of the literature clearly showed that patients who were treated with post-surgical radiotherapy and/or chemotherapy had a better clinical outcome (15, 17, 19), but long-term survival is extremely rare even with radio-chemotherapy.

Conclusion

Malignant transformation of epidermoids should be suspected in any patient with a known epidermoid cyst who does not improve after surgical removal of the cyst or whose condition rapidly deteriorates, and particularly if the CT or MRI shows contrast enhancement in the previous site. This degeneration should be retained if malignant cells are detected in the CSF, even if they did not show specific immunostaining. Their microscopic features should suffice to make the diagnosis. Overall prognosis is poor and worsened by LC.

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