

IMAGISTIC ASPECTS OF THE INTRACRANIAL MENINGIOMA

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Abstract

Meningioma is a benign tumor which derives from meninges. The retrospective study has been carried out on a group of 29 hospitalized patients, diagnosed and treated in County Emergency Clinical Hospital of Timisoara (Romania). The paraclinical diagnosis of the intracranial meningiomas, in the case of our group, was based on CT examination: both native and with contrast substance. The exact diagnosis was established by the histopathological examination, in all cases (hematoxylin –eosin staining).

Key-words: intracranial meningiomas, CT, CT with contrast substance, histopathological diagnosis

Introduction

Meningiomas are frequent tumors; they are found in proportion of 13%-19% of the intracranial tumors, thus being on the second position after gliomas. The notion of benignity should not be taken in the strict sense of the word. Although from a histopathological point of view these are benign tumors, the neurosurgical experience proves that a part of the meningiomas, especially those in case of children, behave like malign tumors, having the tendency to quickly and permanently recur, even after a total extirpation. Meningioma is also an expansive tumor, which does not invade, but comprimes the nervous texture around it, during its expansion. Because of this, the disturbed neurological function recovers after the tumor is extirpated, in most of the cases (1,2,3).

Material and method

The retrospective study has been carried out on a group of 29 hospitalized patients, diagnosed and treated in County Emergency Clinical Hospital of Timisoara (Romania), between 2009-2010, aged 18-64. All the patients had been operated upon, and the diagnosis of meningioma was established after the histological examination.

The paraclinical diagnosis of the intracranial meningiomas, in the case of our group, was based on the CT examination: both native and with contrast substance.

The native CT scan aimed at:

- the localization of the generally well defined tumour which had been outside the parenchyma;

- it indicated a round or a flat tumour, either izodense, or discretely hyperdense (frequent), homogeneous;
- frequently there were indicated punctiform or massive intratumoral calcifications;
- there were identified bone abnormalities with the help of bone window at the level of the implementation base;
- peritumoral edema was objectified through a perilezional hypodensity less or more important;
- indirect signs: mass effect;
- indirect signs: mass effect on the medial line, on the ventricular system or/ and on the tanks from the brain base (4,5,6).

The CT with contrast substance:

- the injection of the contrast substance determined a highly increased tumoral hyperdensity (generally, the SDC impregnation was homogeneous; in some cases there were highlighted meningiomas with necrotic center, which took the contrast substance in a scratchy way or in cockade);
- the injection of the contrast substance allows a clearer highlight of the large implementation base of the tumour and also a net differentiation of the peritumoral edema tumour (7,8,9).

Results and discussion

We studied on 29 patients diagnosed with intracranial meningiomas (21 men and 8 women) (Chart 1), with the age 18-64; 15 patients came from urban, while 14 patients came from rural; to all the patients the diagnosis was established on the base of the clinical criteria, biochemical, imagist (TC) and morphological.

Meningiomas may develop on both sides of the dura mater, especially on its inner face. There are cases of meningiomas without dural attachment. These develop on the endothelial cells of the arachnoid. Meningiomas take two forms: round and flat (“en plaque”). The round meningioma is come across on the brain’s convexity or intraventricularly, where the growth in all directions is free. It has a spherical or ovoid form, with a smooth or nodular surface. The insertion base may be large or small, according to the tumour’s size.

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Tabel 1: The distribution of the cases depending on age and sex.

Age groups	Female	Male	Number of patients
18 – 30	-	2	2
31 – 40	2	3	5
41 – 50	1	4	5
51 - 60	3	8	11
> 60	2	4	6
	8	21	29

The flat meningioma is flattened and stretched and accedes to the dura master on a large surface, while its thickness is small in relation with its insertion base (10). It develops especially at the base of the skull, in this case being accompanied by a marked hyperostose, thus the patient presenting a cranial deformation. At the level of the insertion place of the meningioma, the bone may be modified: either in the sense of thinning due to the process of lysis by pressure, or in the sense of a hyperostosis, which is more frequent in the case of “ en plaque” meningiomas. Sometimes, the tumour may invade the bone and overcome the skull, exteriorizing itself under the teguments (11, 12).

The intracranial disposition topography of the meningioma conditions the neurological semiology and is at the origin of the anatomo-clinical classifications (Chart 1). According to these criteria, the meningiomas are classified into:

- hemispheric convexity meningiomas (4 cases);
- meningiomas of the cranial base (11 cases);
- para-sagittal meningiomas;
- meningiomas of the scythe brain, with unilateral or bilateral development (2 cases);
- meningiomas of the tentorium ;
- meningiomas of the posterior cerebral fossa (12 cases).

The exact diagnosis, in all the cases, was brought by the histopathological examination (hematoxylin- eosin staining).

The histological classification of the World Health Organization divides the meningiomas into 3 main types (Chart 2):

- menigothelial meningioma (14 cases);
- fibrolastic meningioma (5 cases);
- psamomatous meningioma (10 cases).

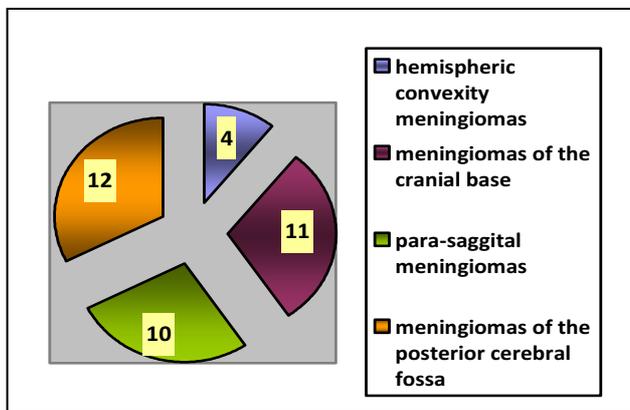


Chart 1: The intracranial disposition topography of the meningiomas in our study group.

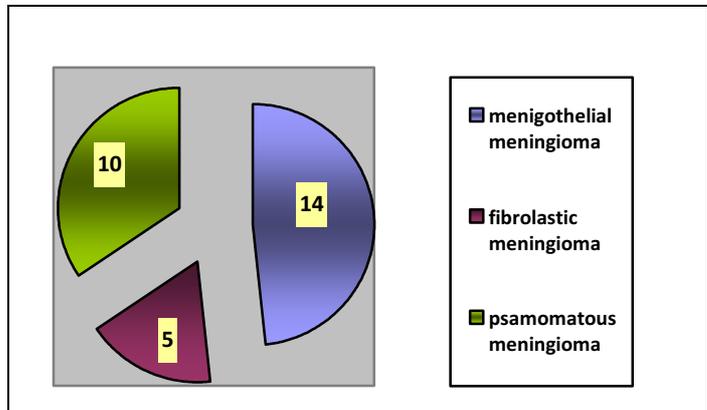


Chart 2. The histological classification of the meningiomas within our study group.

Case 1 (Figures 1,2): Meningioma in plaque, of approximately 5/4 , 2/4 cm, developed at the level of the sphenoidal corpus, on clivus, left cavernous sinus, suprasellar , which includes left internal carotid artery in the cavernous portion, it marks the basilar artery and it moves the optic chiasm. Aneurism dilatation of 4 mm, sessile of

left intracavernous ICA. Without other cranial-cerebral changes.

Case 2 (Figures 3,4): Meningioma does not always have different imagistic characters from the benign one; the unclear margins, the scratchy contrast setting, the necrosis’ presence and the osteolysis at the implementation base are indicative criteria.

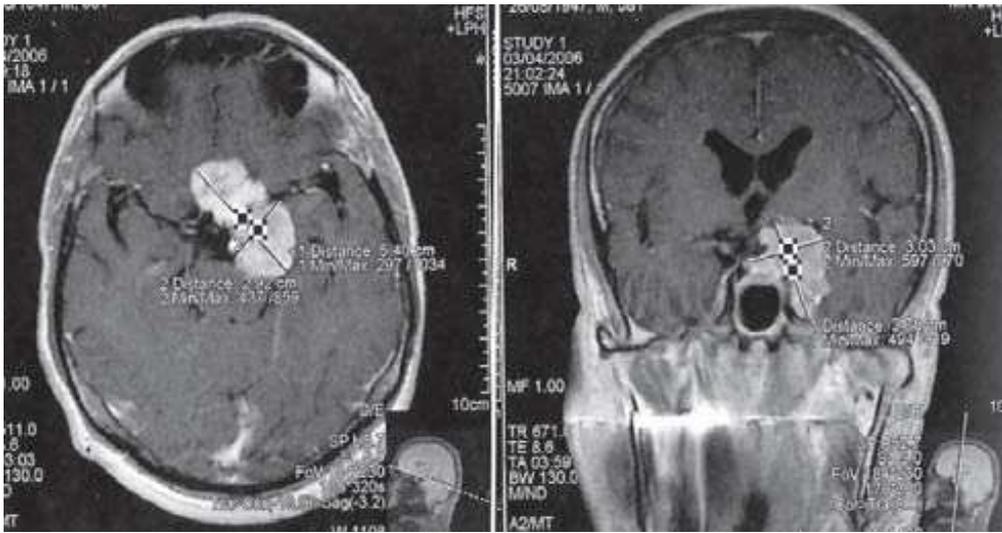


Figure 1: Case 1: T.N. patient, 49 years old, Diagnosis - Meningioma in sphenoidal plaque.

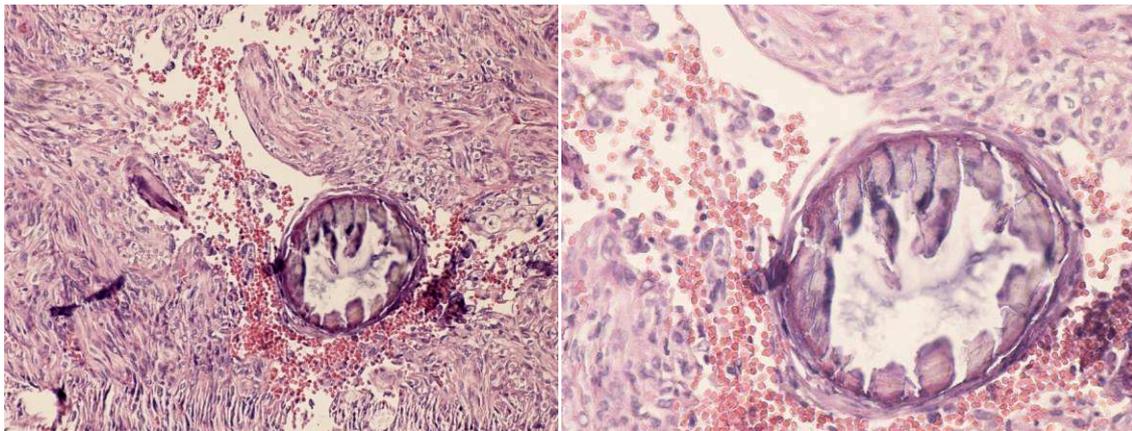


Figure 2: Psammomatous meningioma (HE x 200) and detail: hematic extravasated (HE x 400).

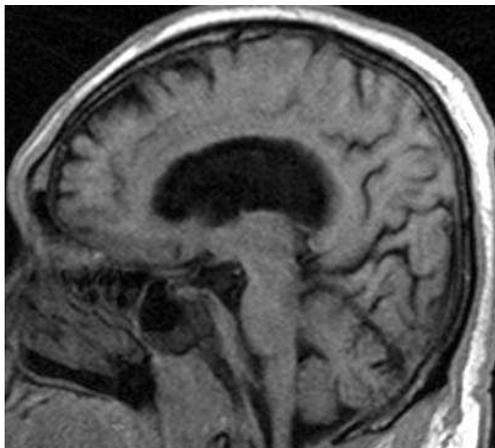


Figure 3: Case 2: R.A. patient , 61 years old: Diagnosis- Meningioma in plaque.

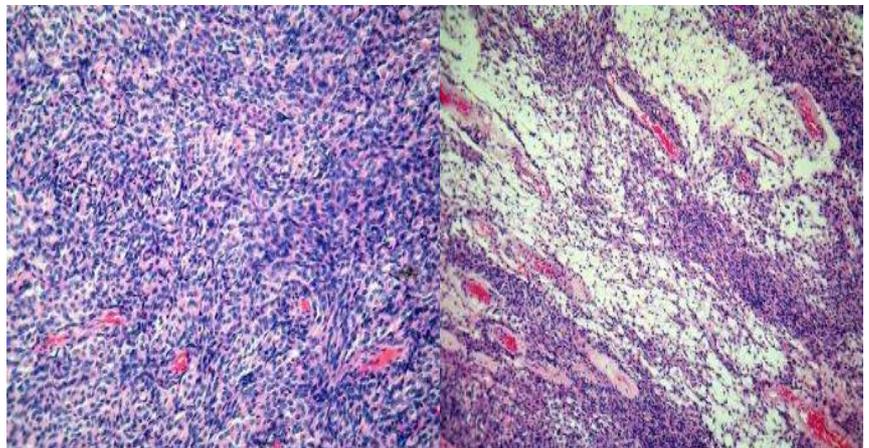


Figure 4: Meningothelial meningioma, oval cells, arranged in compact vortex and isles and focal myxoid degeneration (HE x 100).

Conclusions

- we identified meningiomas in 3 cases which presented fatty degeneration with native hypodense aspect;
- there appeared difficulties in identifying isodense tumours with cortical localization (meningiomas of convexity);
- the best TC examination was performed in a spiral way, fact which led to a shorter examination period and

brought maximum information which could be obtained through the processing (post-processing) of the scanned volume;

- CT- scan and NMR are imaging examinations which accurately specify the topography of brain tumors. These appear as hiperdense, space-replacing formations. A tumoral biopsy is essential in order to highlight the histological type and to establish the treatment.

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