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Neoplastic Cerebral Aneurysm from Metastatic Lung Carcinoma

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Abstract:- Intracranial cerebral aneurysms secondary to a neoplastic etiology are very rare. A few cases have been reported in the literature involving the incrimination of a neoplastic pathology in the formation of cerebral aneurysms. We report the observation of a patient admitted in our hospital for the management of a right hemi-body heaviness, following an intra parenchymal hematoma, whose etiological workup showed the presence of multiple distal aneurysms with a right pulmonary mass and a cardiac metastasis. Through this observation and a review of the literature, we will try to describe the different aspects of this pathology.

Keywords:- *Neoplastic; Aneurysm; Metastatic; Lung; Carcinoma.*

I. INTRODUCTION

In the rare cases reported in the literature concerning neoplastic aneurysms (NA), cardiac myxomas are the most incriminated and less frequently choriocarcinomas and pulmonary carcinomas [1,2,3].

In this report, we describe a case of multiple neoplastic aneurysms secondary to lung carcinoma.

II. CASE REPORT

We report the observation of a 30-year-old female patient, without any notable pathological history, admitted to the emergency room for management of headache with right hemiparesis evolving four days before her admission.

Clinical examination showed a drowsy patient with a GCS of 14 and a right hemiparesis of 3/5 without any other associated neurological signs.

The general examination revealed a hemodynamically and respiratory stable patient with a blood pressure of 12/08. The patient underwent an emergency brain scan, which showed a left fronto-parietal intraparenchymal hematoma with peri-lesional edema measuring 63x47 mm, exerting a mass effect on the occipital horn, without deviation of the midline (figure 1).

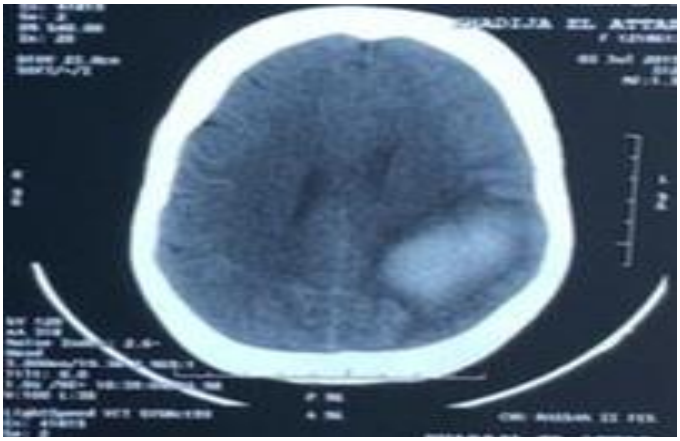

Figure 1: CT scan showing a left parietal hematoma

Given the age of the patient and the location of the hematoma, an additional angioscan was performed urgently to search for a secondary cause that could explain the bleeding.

The angioscan did not reveal any vascular malformations with the incidental discovery of a right upper lobar lung mass (figure 2).

Additional arteriography was performed, showing three ectatic arterial branches in the left posterior parietal area, with slow circulation, which were the site of three fusiform aneurysmal dilatations (figure 3 and 4).

A thoracic-abdominal-pelvic CT scan was performed as part of the extension workup, showing the presence of an intraventricular tissue lesion related to a cardiac metastasis (figure 5).

Figure 2: left lung mass.

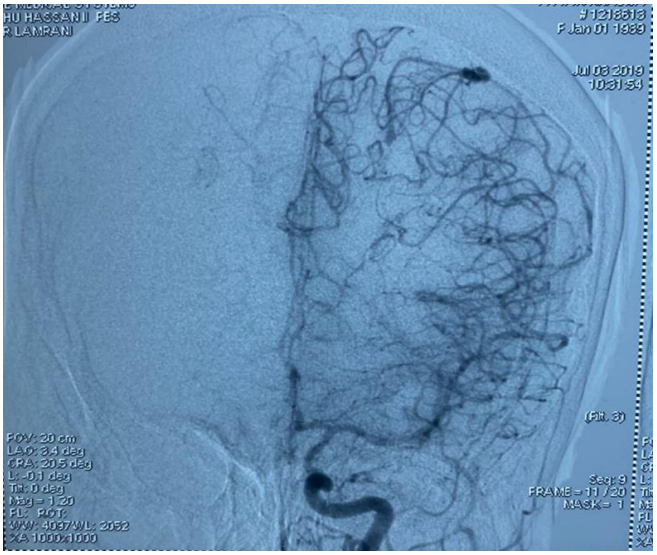

Figure 3: cerebral angiography: distal aneurysms.

The patient underwent a biopsy of the lung lesion and the anatomopathological examination came back in favor of a differentiated carcinomatous process TTF1 negative.

The decision to start chemotherapy was taken, but unfortunately the day before the chemotherapy treatment, the patient presented a respiratory distress followed by a cardio-circulatory arrest not recovered after CPR.

III. DISCUSSION

Tumor emboli of cerebral vessels are not uncommon, but their pathophysiology remains poorly understood [4].. Segmental destruction of the vessel wall caused by neoplastic cells derived from tumor emboli is considered the underlying process leading to the formation of NA [5].

However, the sequence of events involved in the process is not clear. Re-establishment of circulation through the artery segment already damaged by the neoplastic process may play.

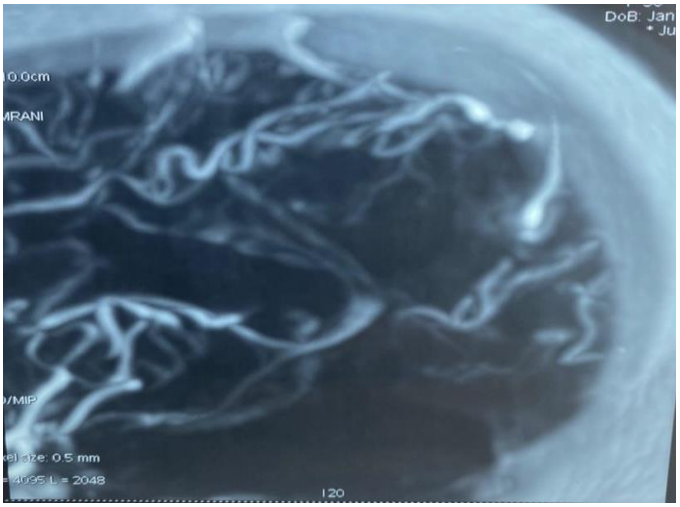

Figure 4: 3D angiography showing three fusiform aneurysms.

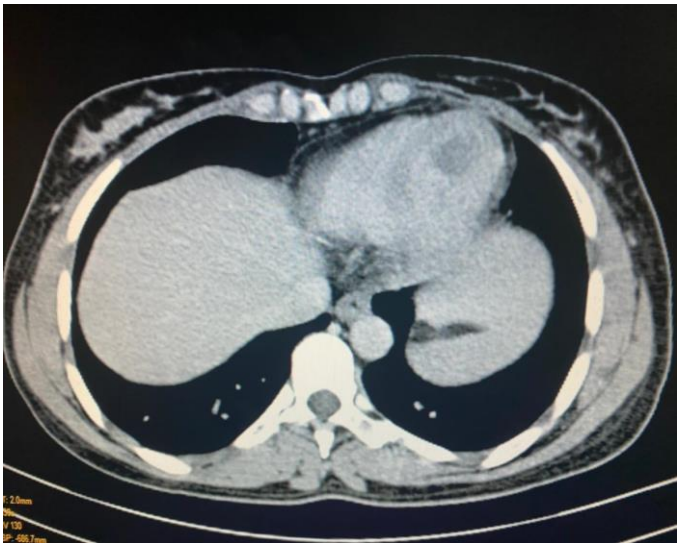

Figure 5: thoracic CT scan showing cardiac metastasis

An important role in this regard, as suggested by the mycotic aneurysm [6].

The necrotic arterial wall may continue to dilate, with or without further rupture, depending on the degree of destruction, which in turn is likely related to the degree of malignancy of the neoplasm [5,6,7,8]. This may explain the fact that all recognized neoplastic aneurysms due to carcinoma ruptured and produced massive intracranial hemorrhage [9,10], whereas cardiac myxoma, which is a benign tumor, ruptured in only two cases [11].

Stabilization or complete resolution of a neoplastic aneurysm has been demonstrated by repeated cerebral angiographic studies [11,12] Roeltgen et al [12] reported a case of a neoplastic aneurysm due to a cardiac myxoma, with the aneurysm spontaneously disappearing within six months. The patient described by Nakahara et all [11] had two neoplastic aneurysms due to metastatic choriocarcinoma, one ruptured and caused subarachnoid hemorrhage, and the other completely resolved after chemotherapy.

In both cases, the aneurysm resorption was probably due to thrombotic occlusion of the lumen, because the aneurysm and its branch were not visible on cerebral angiography. There is no evidence to suggest that the course of neoplastic aneurysm due to cardiac myxoma or carcinomas other than choriocarcinoma can be altered by chemotherapy. The effect of radiation therapy on neoplastic aneurysms is not yet known.

Like the mycotic aneurysm, most neoplastic aneurysms are small and located in small peripheral branches of cerebral arteries, often buried in a cortical groove, and can easily go undetected at autopsy.

In case of rupture, the partially destroyed sacs may be obscured by hemorrhage, making their identification on radiological studies or histopathological examination equally difficult [13].

To our knowledge, only 5 cases of AN from metastatic lung cancer have been reported [14,15] All but one of these cases were secondary to non-small cell lung cancer. They also all presented with intracerebral hemorrhage, except for one case that presented with subarachnoid hemorrhage.

The age of the patients ranged from 38 to 68 years, and the location of the aneurysm included the anterior and posterior circulation. All reported aneurysms were described as fusiform, including this case. Similarly, the majority of NAs of non-lung cancer origin were described as irregular and fusiform on diagnostic cerebral angiography [16,17].

IV. CONCLUSION

Cerebral neoplastic aneurysms are a rare pathology, and can be fatal for the patient.

Their rupture is manifested by an intracranial hemorrhage (meningeal hemorrhage and or intraparenchymal hematoma). It is necessary to think of AN in front of each patient who presents a spontaneous meningeal hemorrhage or intraparenchymal hematoma with an associated neoplastic context.

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