

# MALIGNANT TRANSFORMATION OF PLEOMORPHIC XANTHOASTROCYTOMA

## Case report

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**ABSTRACT** - We report a case of a pleomorphic xanthoastrocytoma which manifested itself as a cystic isodense lesion in the right fronto-temporal lobe in a 26 year-old woman. It appeared as a soft yellow tumor with cystic cavities on surgery. Five months after this surgery, the patient was submitted to a new operation, which revealed a friable tumor, easily differentiated from the normal parenchyma, with cystic components. The histopathological examination demonstrated pleomorphic xanthoastrocytoma with malignant transformation. Histologically, the tumor at first procedure was composed of pleomorphic astrocytes with multinucleated and foamy cells. A rare case of malignant transformation in pleomorphic xanthoastrocytoma is presented, discussed and illustrated in this paper.

**KEY WORDS:** xanthoastrocytoma, astrocytoma, tumor, histopathology.

### **Transformação maligna de xantoastrocitoma pleomórfico: relato de caso**

**RESUMO** - Um caso raro de transformação maligna de xantoastrocitoma pleomórfico é apresentado, discutido e ilustrado neste estudo. Descrevemos um caso de xantoastrocitoma pleomórfico diagnosticado como lesão isodensa no lobo fronto-temporal direito, em uma paciente de 26 anos. Na cirurgia, encontrou-se tumor mole, de cor amarelada, com cavidade cística. Cinco meses após o procedimento, a paciente foi submetida a nova intervenção que revelou um tumor friável, facilmente diferenciado do parênquima normal, com componentes císticos. O exame histopatológico demonstrou um xantoastrocitoma pleomórfico com transformação maligna. O tumor, no primeiro procedimento, era formado por astrócitos pleomórficos com células vacuolizadas e multinucleadas.

**PALAVRAS-CHAVE:** xantoastrocitoma, astrocitoma, tumor, histopatologia.

Pleomorphic xanthoastrocytoma (PXA) is an astrocytic neoplasm with a relatively favourable prognosis, typically encountered in children and young adult. It is superficially located in the cerebral hemispheres, presenting involvement of the meninges, and a pleomorphic histological appearance that includes lipidized, GFAP-expressing tumor cells surrounded by a reticulin network<sup>1,2</sup>. Since its description by Kepes et al in 1979<sup>1</sup>, PXA has been considered to have a favorable outcome compared to other astrocyte-derived tumors. However, MacCaulay et al.<sup>3</sup> have revealed a mortality rate of 20%.

Well-documented cases of malignant transformation in pleomorphic xanthoastrocytoma are rare in the literature. We report one case.

### **CASE**

This 26 year-old female was admitted to the hospital with a history of seizures for the last five months. A CT-scan detected a cystic isodense right fronto-temporal lesion enhanced by contrast injection. At surgery, we found a soft yellow tumor with cystic cavities. We had some difficulties to differentiate the tumor from the normal brain, so only partial removal could be achieved. The patient was discharged home on anti-convulsive drugs. Due to the histo-

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Fig 1. A huge isodense right fronto-temporal lesion, invading the corpus callosum with cystic cavities.

pathologic diagnosis of a PXA without anaplasia, no further adjuvant radiotherapy or chemotherapy was performed.

Five months after surgery, the patient had a convulsive episode. On neurological examination a bilateral papiledema was found. MRI demonstrated a huge isodense right fronto-temporal lesion; which invaded the corpus callosum with cystic cavities on T1 weighted images, enhanced after gadolinium injection (Fig 1). Surgical exploration revealed a friable tumor easily differentiated from the normal parenchyma, with cystic components. The histopathological examination demonstrated a PXA with a malignant transformation.

*Histopathological findings* - Histologically, the tumor on the first procedure was composed of pleomorphic astrocytes (Fig 2) with multinucleated and foamy cells. A dense reticulin network and lymphocytic infiltrations were found (Fig 3). Necrosis and vascular proliferations were not observed. A second resection showed the same aspect but there were areas with small fibrillary astrocytes, mitoses, multilayered vascular cells and areas of necrosis. The reticulin network had disappeared (Fig 4,5). The diag-

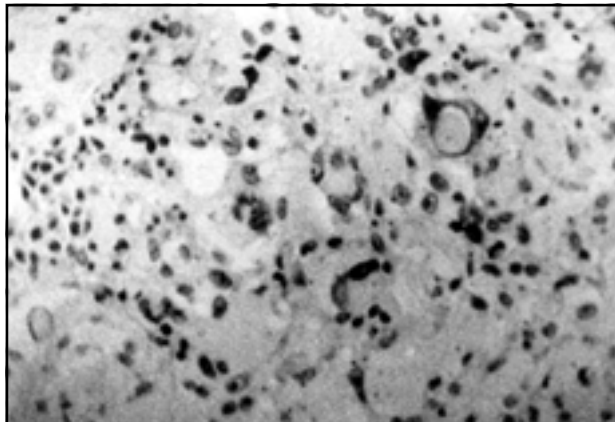


Fig 2. The tumor showing pleomorphic astrocytes with multinucleated cells and foamy cells. H & E , x 400.

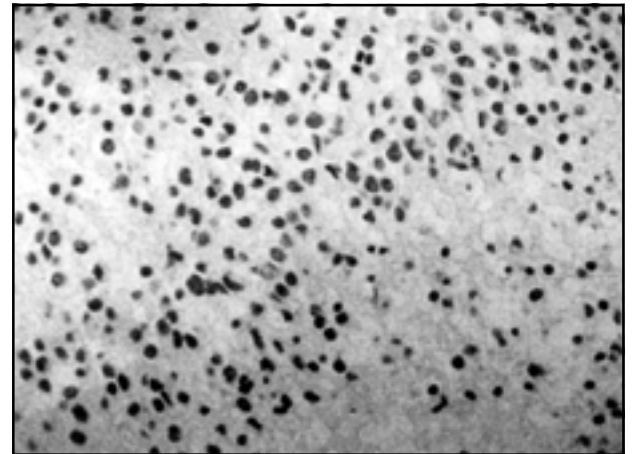


Fig 4. Tumor showing areas with small fibrillary astrocytes and necrosis. H & E , x 400.

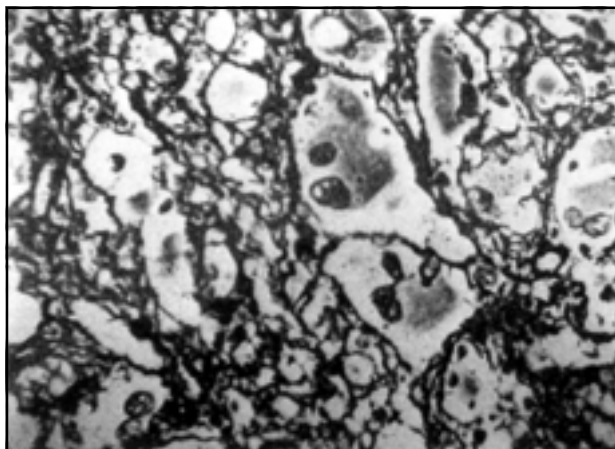


Fig 3. A dense reticulin network among pleomorphic astrocytes. Silver impregnation, x 400.

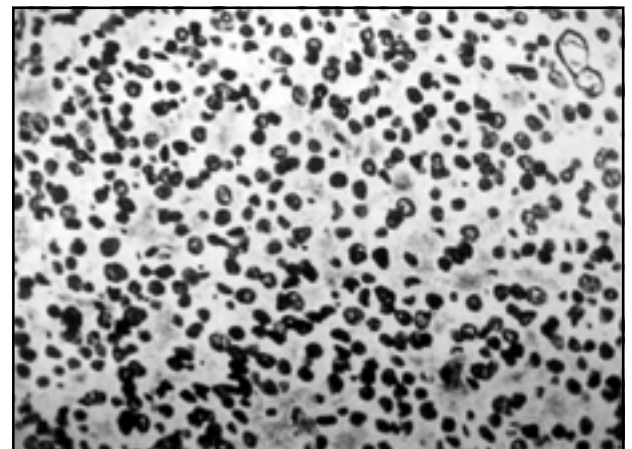


Fig 5. The reticulin network had disappeared among the small astrocytes. Silver impregnation, x 400.

nosis was glioblastoma. The neoplastic cells were positive for glial fibrillary acidic protein. The MIB-1 labeling index (a marker of cell proliferation) in the initial tumor was 0.2 % and the recurrent tumor had a MIB-1 labeling index of 5.8%.

## DISCUSSION

PXAs have been regarded as rather benign tumors despite the cellular pleomorphism. Clinical observations disclose common features of these neoplasms: patients are usually below 30 years of age; the tumors are located predominantly in the temporal and parietal regions; they have cystic appearance and they are frequently superficially located. Epileptic seizures are a typical initial symptom.

The initial clinical, radiological and histological features of this tumor were those of a PXA.

With some notable exceptions, pleomorphic xanthoastrocytomas behaves in a less malignant fashion than it might be suggested by their highly pleomorphic histology. However, in cases proven to be fatal, they usually have undergone transition to anaplastic astrocytoma or glioblastoma. Recurrences may show a histological pattern analogous to the original tumor, but increasing anaplasia may also be set<sup>4-11</sup>. Pleomorphism may cease to be a feature and closely packed smaller cells may come to dominate the tumor. MacCaulay et al.<sup>7</sup> assume that a focus of small mitotically active cells is a sign of imminent malignant transformation. In addition, with increasing malignancy, the formerly rich reticulin network may become fragmented or disappear completely. Necrosis usually occur in these more anaplastic recurrences. Our case is in accordance with these observations. The patient presented a typical PXA that recurred as glioblastoma five months later, comparable to the cases reported by Kepes et al.<sup>3,4</sup>, Weldon-Linne et al.<sup>11</sup> and one case described by Tonn et al.<sup>10</sup>.

Giannini et al.<sup>12</sup> made a study based on 71 cases with available information regarding clinical and the-

rapeutic data and follow-up collected from the literature, confirming that PXA has a 70% 10-years survival time, and mitotic index and extension of resection appear to be the main predictor factors of recurrence and survival rate.

The rarity of PXA demands neuropathologic experience to find the correct diagnosis, since misinterpretation as glioblastoma might cause harmful therapeutically decisions. The clinical course of patients is not always favorable. A close follow-up is needed in order to detect any recurrence with malignant transformation.

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