v. 5, n. 2, 2025

International Journal of Health Science

Acceptance date: 07/01/2025

MATURE INTRACRANIAL TERATOMA: CASE REPORT

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http://lattes.cnpq.br/8529681469406105

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Abstract: Introduction: Intracranial teratomas are rare germ cell tumors, accounting for approximately 0.5% of all intracranial tumors. They can be classified as mature, immature, or malignant, and are typically located along the midline of the brain, particularly around the third ventricle, pineal region, and suprasellar area. **Case Report:** A 20-year-old female patient presented with a history of seizures, headache, nausea, vomiting, and diplopia. A cranial MRI revealed a multicystic lesion in the left lateral ventricle with ventricular dilation. Surgery was performed with an interhemispheric approach and partial resection of the lesion, confirming the diagnosis of a mature teratoma. The patient had a favorable recovery with no neurological deficits. **Discussion:** Intracranial teratomas are rare, representing 0.5% of brain tumors, with peaks of incidence before the age of 5 and between 5 and 14 years. They are typically benign and radioresistant. Surgical resection is the primary and curative treatment, with a high survival rate. MRI is useful for characterizing the lesion. **Conclusion:** Intracranial teratomas are rare and must be differentiated from other germ cell brain tumors. Complete surgical resection is curative and results in good survival rates without the need for further interventions.
Keywords: intracranial teratomas, germ cells, surgical resection.

INTRODUCTION

Intracranial teratomas are germ cell tumors (GCTs) that account for approximately 0.5% of all intracranial tumors. They originate during the third to fifth week of gestation due to abnormal distribution of germ cells. GCTs can be classified as germinomas, nongerminomatous, or mixed.(1-6)

Teratomas are of the nongerminomatous subtype, originating from pluripotent cells derived from the three germ layers of normal oncogenesis (ectoderm, mesoderm, and endoderm). Histologically, teratomas are classified as mature, immature, or malignant.(4-9) Mature teratomas are composed of well-differentiated tissue and exhibit low mitotic activity, while immature teratomas resemble fetal tissue, and malignant teratomas are very rare. (4-11)

The most common intracranial locations are midline structures of the brain, a region with high potential for the displacement of embryonic tissues. However, they can also be found around the third ventricle, especially in the pineal and suprasellar regions, or parasellar areas. Less common locations include the basal ganglia, ventricular system, pontocerebellar angle, and cavernous sinus. (4-8,10,12-14) In 5-10% of cases, patients present tumors in both the pineal and suprasellar regions. The presence of tumors in the lateral and third ventricles is observed in 10% of patients.(15)

CASE REPORT

A 20-year-old female patient presented with a history of seizures, headache, and vomiting, later developing diplopia. She had no significant comorbidities, and her physical exam was unremarkable. A cranial MRI revealed a multicystic solid lesion measuring approximately 5.2 x 3.9 x 5.0 cm within the left lateral ventricle, obliterating the left foramen of Luschka and causing dilation of the left lateral ventricle (Figure 1).

The patient underwent surgery with an interhemispheric approach, opening the corpus callosum to access the lesion, followed by partial resection of the solid and cystic content (Figure 2).

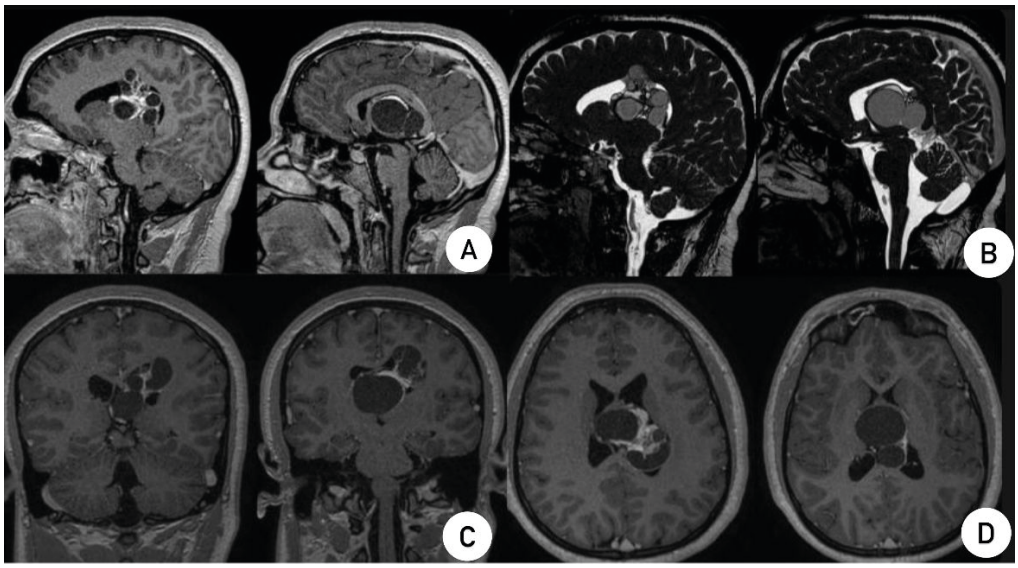

Figure 1: A- Axial T2 FLAIR MRI section; B- Sagittal section of MRI with Fiesta weighting; C- Coronal T1-weighted MRI section; D- Axial T1-weighted MRI section. Cranial MRI with the appropriate cuts and sequences showing solid/cystic content measuring approximately 5.2 x 3.9 x 5.0 cm in the left lateral ventricle, obliterating the left foramen of Luschka and causing dilation of the lateral ventricle.

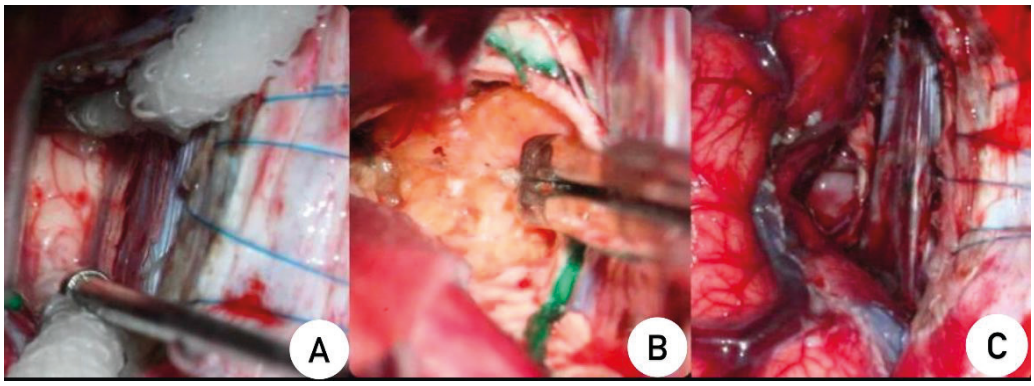

Figure 2: Histological examination confirmed the diagnosis of Mature Teratoma (MT). The patient had a good recovery, without neurological deficits, and no further treatment was required.

DISCUSSION

Teratomas are classified histologically as mature, immature, or malignant. Mature teratomas are better differentiated, but have a very low incidence (0.2%) and a male predominance (5:1). They have two peaks of incidence: 10% occur before 5 years of age, and 48% occur between 5 and 14 years of age.(15) Clinical presentation is nonspecific and depends on the location and size of the lesion, with signs of intracranial hypertension being the most common. Clinically, the incidence decreases with age.(16)

CT and MRI are useful in estimating the nature of the lesion and may show mixed-density components, including fat, soft tissue, cartilage, and calcified tissues such as bones and teeth. MRI is the preferred diagnostic and staging method, although CT is highly sensitive for detecting suprasellar and pineal GCTs. (15) MRI images show a mixed signal intensity pattern and varying degrees of enhancement. Calcifications are present in about half of mature teratomas, and calcifications in the midline or paraxial regions may raise suspicion of mature teratomas.(11,17)

Before confirming the diagnosis of teratoma, it is essential to rule out other intracranial neoplasms. The patient's age and biochemical markers, such as serum alpha-fetoprotein (AFP) and human chorionic gonadotropin (β-HCG), can be helpful in differentiating teratomas from other intracranial lesions. Elevated AFP levels are strongly indicative of malignant teratoma.(4,8,11,16)

The differential diagnosis includes astrocytoma, choroid plexus papilloma, ependymoma, and primitive neuroectodermal tumor (PNET). Histological analysis is crucial for confirming the diagnosis of an intracranial GCT and identifying its histological subtype. (15)

Treatment options for teratomas remain controversial. Whenever possible, radical resection is the recommended approach. (11,16,18) Excision is considered complete when more than 90% of the tumor is resected. (16) Due to the radioresistance of mature teratomas, complete tumor removal is the most appropriate therapeutic approach. The clinical prognosis of patients with primary intracranial teratomas is directly related to the pathology involved.(16,18)

Any residual portion of a mature teratoma may include a small amount of immature or malignant tissue. Compared to immature or malignant teratomas, mature teratomas have a lower recurrence rate after surgical resection. (16,18,19)

Previous research indicates that the 5-year survival rate for patients with immature or mature teratomas containing a malignant component ranges from 44% to 68%.(11,16) Although mature teratomas have a low recurrence rate after surgical resection, several studies report that patients with intracranial teratomas may develop other germ cell tumors at different intracranial sites.(16,18,20-22) Despite generally uncomplicated recovery, it is essential for these patients to be monitored over an extended period due to the possibility of recurrence or the development of new teratomas, both intracranial and extracranial.

CONCLUSION

Intracranial teratomas, though rare, present significant challenges in diagnosis and management. Radical resection is the main therapeutic approach and is crucial for improving clinical outcomes. This study emphasizes the need for prolonged monitoring and highlights the importance of complete tumor removal and proper follow-up to ensure a favorable prognosis.

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