Pineal teratoma treatment

- A Rare Presentation of Ruptured Pineal Region Teratoma with Postoperative Aseptic Meningitis
- Pineal region teratoma with metastases in uncommon locations: a case report
- Pineal teratoma with nephroblastic component in a newborn male: Case report and review of the literature
- Radiological pseudoprogression post-radiotherapy in a child with pineal germ cell tumour
- Mixed pineal mature teratoma and germinoma in two brothers of the fraternal triplets
- Successful treatment of metastatic betaHCG-secreting germ cell tumor occurring 3 years after total resection of a pineal mature teratoma
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- hCG-secreting pineal teratoma causing precocious puberty: report of two patients and review of the literature

Treatment for a pineal teratoma typically involves surgical removal, often followed by chemotherapy and/or radiation therapy depending on the extent of the tumor and whether it has spread to surrounding areas.

Surgery: Surgical resection is the primary treatment for pineal teratomas. The goal is to remove as much of the tumor as possible while preserving neurological function. However, complete removal may be challenging due to the location of the tumor near critical structures in the brain.

Chemotherapy: Chemotherapy may be used before or after surgery to shrink the tumor, making it easier to remove or to target any remaining cancer cells. The specific chemotherapy regimen depends on the type and stage of the tumor.

Radiation therapy: Radiation therapy may be recommended after surgery to kill any remaining cancer cells and reduce the risk of recurrence. It may also be used if the tumor cannot be completely removed surgically.

Follow-up care: Regular follow-up visits with healthcare providers are essential to monitor for any signs of recurrence and to manage any long-term side effects of treatment.

The treatment plan for a pineal teratoma is tailored to each individual based on factors such as the size and location of the tumor, the extent of spread, and the person's overall health. It's essential for patients to discuss their specific situation with a healthcare team experienced in treating brain tumors.

Case reports

A 35-year-old Asian white man presented with diplopia and acute neural symptoms in the lower limbs such as numbness, tingling, and paralysis. His medical history was notable for pineal teratoma, treated 1 year previously with surgery, radiotherapy, and chemotherapy. Physical examination of the lower limbs showed absent reflexes and sensation with muscle power scale score of 1 in both limbs. Magnetic resonance imaging of brain and spine revealed many lesions in various locations, most compatible with neural, spinal, and vertebral metastases. Unfortunately, the patient died suddenly before any intervention was carried out.

Conclusion: It is extremely rare for pineal region teratoma to metastasize to the spinal cord and vertebrae, thus more vigilant observation and examination should be provided to patients with pineal teratoma to detect any new lesions and prevent them from becoming dangerous [1].

Although teratoma with nephroblastoma is most often found in the kidney, 24 of 59 reported cases are associated with extrarenal locations, such as the mediastinum or retroperitoneum. To our knowledge, this is the first patient in the literature with intracranial/pineal teratoma with nephroblastoma, which was managed with staged transcranial approaches resulting in gross total resection and no adjuvant therapy (surveillance observation imaging). We further augmented the patient's management by comprehensive genomic profiling of the tumor to better understand the molecular biology and explore options for targeted therapy [2].

A 9-year-old male child with a pineal teratoma/germinoma underwent surgical resection followed by adjuvant chemo-radiotherapy. The magnetic resonance imaging scan 4 months post-radiotherapy showed a contrast-enhancing lesion within the surgical cavity suspicious of recurrence. These radiological findings subsequently resolved without any specific intervention. The child continues in remission 2 years post-treatment. This case illustrates the occurrence of pseudoprogression post-radiotherapy in intracranial GCT and highlights an unmet need for greater implementation of functional imaging techniques in paediatric neuro-oncology to avoid undue discontinuation of effective treatments or inappropriate enrolment in clinical trials [3].

The case of a mixed mature teratoma and germinoma of the pineal region in two brothers of fraternal triplets. The older brother was initially diagnosed at the age of 11 years with the pure teratoma of the pineal region but the review of the pathology 3 years after initial surgery revealed the mixed mature teratoma with 5% germinomatous component. The younger brother was diagnosed at the age of 13 years with a mixed mature teratoma with 10% germinomatous component tumor of the pineal region. The younger brother has been treated with adjuvant chemo-radiotherapy and the older brother was treated without adjuvant therapy. Both brothers had no recurrence.

Conclusion: Pineal mature teratomas have a good prognosis, in contrast to their immature or mixed counterparts. A rigorous histological examination of the tumor samples is mandatory, to not omit a mixed contingent within the tumor [4].

A 14-year-old boy was initially diagnosed with a mature teratoma in the pineal region that recurred as a metastatic beta-human chorionic gonadotropin (βHCG)–secreting germ cell tumor 3 years after gross total resection. A surveillance brain MRI scan during follow-up demonstrated multiple lesions within the ventricular and subependymal area infiltrating the brain parenchyma along with concomitant elevated levels of βHCG in both the serum and cerebrospinal fluid. The patient underwent chemotherapy with PEI (cis-platinum, etoposide, ifosfamide) followed by radiation therapy according to the SIOP CNS GCT protocol. The patient is currently alive without evidence of disease 35 months after starting therapy.

Conclusions: A careful and long-term follow-up including scheduled tumor markers as well as

surveillance MRI scans is required for patients with intracranial teratoma to detect and diagnose recurrent malignant disease, especially since multimodal therapy provides the potential for long-term cure [5)]

Utsuki et al. describe the first case of the malignant transformation of an intracranial mature teratoma into a yolk sac tumor in a 16-year-old boy who presented with a 1-month history of anorexia and somnolence. Seven years before this presentation, the boy had undergone surgery for the extirpation of a mature pineal teratoma. Computed tomography images obtained at his second presentation revealed a homogeneously enhanced mass within the third ventricle. The tumor was resected and the results of a histological examination were consistent with a yolk sac tumor. After resection, the patient underwent radiation therapy followed by chemotherapy with cisplatin and etoposide but died of tumor progression 15 months after his second hospitalization [6)].

Two boys are described with precocious puberty (PP) due to pineal immature teratoma associated with choriocarcinoma. Patient 1 was a 7-year-old boy with a 2-year history of PP. He had elevated CSF and plasma beta-hCG levels. Magnetic resonance imaging (MRI) showed a 3.0 cm pineal mass. He was initially submitted to a trial with radiotherapy, followed by radical surgical resection, stereotactic radiotherapy, and chemotherapy. Long-term follow-up included the appearance of acute hydrocephalus requiring CSF shunting, local hemorrhage, and extensive radionecrosis. Death occurred 1.5 years after diagnosis. Patient 2 was a 7-year-old boy with an 8-month history of PP. He had elevated CSF and plasma beta-hCG and alpha-fetoprotein levels. MRI showed a 1.0 cm pineal mass. He was submitted to radical surgical resection (which caused normalization of levels of markers) and prophylactic chemotherapy. The boy is doing well 1.5 years after diagnosis. An extensive review of the literature corroborates the idea that this last treatment paradigm (surgery and chemotherapy) probably represents the best treatment regimen for these patients [7)].

A 10-year-old boy who presented with headache and vomiting was admitted to our hospital. Neuroradiological studies revealed a tumor in the pineal region. The tumor was removed. Histologically, the tumor proved to be a mature teratoma. The patient's postoperative course was uneventful. The patient received no adjuvant therapy and was followed in the outpatient clinic. Three years later, he was readmitted with transient left upper limb weakness and vomiting. Neuroradiological studies showed a tumor in the bilateral basal ganglia.

Intervention: The second tumor, which was located in the right basal ganglion, was partially removed for biopsy. Histologically, the tumor proved to be a germinoma. The patient received three cycles of combination chemotherapy consisting of carboplatin and etoposide with radiotherapy. After the second course of chemotherapy, magnetic resonance imaging studies revealed no evidence of the tumor.

Conclusion: The second tumor was considered to be a de novo metachronous neoplasm rather than a recurrence of the original mature teratoma. We think that if primordial germ cell groups exist along the midline of the brain, more than two primordial germ cell groups could give rise to metachronous neoplasms at different sites and with different histological types [8)].

1)

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