Corpus callosum germinoma

Though known intracranial germinomas arise from midline structures, occurrence within the corpus callosum is exceedingly rare.

Stereotactic biopsy make the affirmatory diagnosis. Operative total-removal is impossible because of deep location, neighbour of vital structure and invasion. The combined therapy with interstitial brachytherapy was effective [1].

Case reports

2015

Germinoma with an extensive rhabdoid cell component centered at the corpus callosum [2]

2013

A rare case of secreting primary intracranial germinoma with extensive intraventricular metastasis presenting as a multi-cystic butterfly lesion in the genu of the corpus callosum in a young boy [3].

A 33-year-old man with diplopia, sleepiness, and paresthesia of the left upper limb that were slowly progressive. On admission, he presented with restriction in the vertical movement of the eyes and abduction of the right eye, and horizontal and convergence nystagmus. Slight weakness of the left upper limb, bilateral Babinski sign, and truncal ataxia were also noted. Cerebral magnetic resonance imaging was performed, and gadolinium-enhanced T1-weighted imaging revealed a mass lesion that involved the diencephalon and the corpus callosum, which was invariably enhanced. Specimens obtained using a brain biopsy showed epithelioid granuloma with the presence of foreign body giant cells and lymphocytic infiltration. Prednisolone was administrated because we suspected neurosarcoidosis, but the clinical symptoms worsened with the enlargement of the lesion. A re-evaluation of the biopsy specimens using immunohistochemistry revealed tumor cells of germinoma that were scattered among the lymphocytes and positive for periodic acid-Schiff staining, placental alkaline phosphatase, and c-kit. A combination of chemotherapy and radiation resulted in clinical improvement and marked reduction of the mass lesion in size [4].

2010

Germinoma with syncytiotrophoblastic giant cells arising in the corpus callosum [5].

2008

A 25-year-old man with the pathological diagnosis of a germinoma. The patient initially developed an eating disorder at the end of 2003 and a character change ensued since the beginning of 2004. On

admission in August 2004, his cardinal symptoms and signs included marked apathy, depersonalization, generalized muscle wasting, and decreased tendon reflexes. Brain T2-weighted (T2-WI) MR and FLAIR images showed high signal intensities in the suprasellar region and at the genu of the corpus callosum that extended along the sub-pia mater of the right anterior horn. These lesions showed mild enhancement on gadolinium-enhanced T1-WI. CSF examination revealed a mildly elevated level of protein and increased cell counts but did not show any malignant cells on repeated spinal tap. The patient's status remained practically unchanged till December 2004 when he developed diabetes insipidus. Soon afterward, the patient collapsed into akinetic mutism and developed corresponding new lesions at the tegmentum of the midbrain. These new lesions disappeared spontaneously and akinetic mutism regressed without any specific therapy. We tentatively diagnosed of neurosarcoidosis based on a characteristic progressive-regressive clinical course, CSF data, and radiological findings. Clinical symptoms and the enhanced masses on MRI were highly responsive to steroid therapy after which the patient was able to return home. However, disturbances in consciousness and tenacious vomiting recurred in September. Brain MRI revealed a markedly re-enlarged and easily enhanced mass at the right anterior horn, which extended into the cerebral aqueduct and resulted in obstructive hydrocephalus. On surgery, histopathological investigation revealed germinoma. This case highlights the need for careful discrimination between a slow growing germinoma and chronic granulomatous diseases of the brain such as neurosarcoidosis. Early histological investigation may be warranted in patients who present difficulties during differential diagnoses [6)].

A metachronous germ cell tumor with different histological type occurring 12 years after resection of a pineal germinoma. Histological examination of the original tumor revealed germinoma without any other component of germ cell tumor, and the patient underwent chemotherapy followed by 24 Gy of localized irradiation. Twelve years later, follow-up MR imaging showed a round mass in the genu of the corpus callosum. Two courses of chemotherapy were administered, but the tumor size remained stable. A second operation was performed and this second tumor was completely removed. The histological diagnosis was mature teratoma. The second tumor was considered as a metachronous mature teratoma rather than a recurrence of the original germinoma. To the authors' knowledge, this combination of metachronous germ cell tumor has not previously been reported in the literature [7)].

2006

An 8-year-old boy presented with a rare case of germinoma involving the bilateral basal ganglia and cerebral white matter manifesting as precocious puberty. Magnetic resonance (MR) imaging at the initial presentation demonstrated mild hyperintense areas in the bilateral basal ganglia and corpus callosum on T1-weighted images, and a small hyperintense spot in the right internal capsule on T2-weighted images. Human chorionic gonadotropin (hCG) level was elevated in the cerebrospinal fluid (CSF), so we strongly suspected that threre was a hCG-producing germinoma originating in the bilateral basal ganglia. Stereotactic biopsy was performed. Histological examination revealed two-cell pattern germinoma. After three cycles of combination chemotherapy consisting of ifosfamide, cisplatin, and etoposide, followed by whole brain irradiation with a total dose of 24 Gy, the CSF hCG level fell below the detection limit, but MR imaging demonstrated no significant change. Intracranial hCG-producing germinoma should be suspected in patients presenting with precocious puberty and elevated CSF hCG level. Moreover, slight intensity change on MR imaging is important to identify germinoma arising from the basal ganglia in the early stage [8)].

1)

Wang YM, Tian ZM, Yu X, Xu YG, Wang HW, Sun JZ, Li ZC. [Diagnosis and radiotherapy of germinomas arising in basal ganglia and thalamus]. Zhonghua Wai Ke Za Zhi. 2007 Jul 15;45(14):979-81. Chinese. PubMed PMID: 17961386.
2)

Tajima S, Koda K. Germinoma with an extensive rhabdoid cell component centered at the corpus callosum. Med Mol Morphol. 2015 May 27. [Epub ahead of print] PubMed PMID: 26012485.
3)

Chuan Aaron FS, Dawn CQ, Kenneth CT, Hoe NW, Yen SS, Chee Kian T. Primary human chorionic gonadotropin secreting germinoma of the corpus callosum. Surg Neurol Int. 2013 Oct 8;4:137. doi: 10.4103/2152-7806.119537. eCollection 2013. PubMed PMID: 24233184; PubMed Central PMCID: PMC3815051.
4)

Riku Y, Ito M, Atsuta N, Watanabe H, Momota H, Sobue G. [Intracranial germinoma masquerading as a granulomatous inflammation, diagnostic failure after brain biopsy]. Rinsho Shinkeigaku. 2013;53(10):835-8. Japanese. PubMed PMID: 24225569.
5)

Yonezawa H, Shinsato Y, Obara S, Oyoshi T, Hirano H, Kitajima S, Arita K. Germinoma with syncytiotrophoblastic giant cells arising in the corpus callosum. Neurol Med Chir (Tokyo). 2010;50(7):588-91. PubMed PMID: 20671388.
6)

Hieda S, Fukui T. [Germinoma presenting with personality and socio-behavioral abnormalities may challenge differential diagnoses]. Brain Nerve. 2008 Aug;60(8):949-53. Japanese. PubMed PMID: 18717199.
7)

Kamoshima Y, Sawamura Y, Iwasaki M, Iwasaki Y, Sugiyama K. Metachronous mature teratoma in the corpus callosum occurring 12 years after a pineal germinoma. J Neurosurg. 2008 Jul;109(1):126-9. doi: 10.3171/JNS/2008/109/7/0126. PubMed PMID: 18590442.
8)

Sugiyama S, Kumabe T, Mino M, Fujimura M, Fujiwara I, Tominaga T. [Precocious puberty caused by hCG-producing germinoma involving the bilateral basal ganglia and cerebral white matter without 1ypical radiologic findings: case report]. No Shinkei Geka. 2006 Jun;34(6):619-24. Japanese. PubMed PMID: 16768139.