

Clinicopathological Analysis of a Primary and Solitary Brain Plasmacytoma: Case Report with an Encephalocoele

Chunhui Li
Xiaoping Jin
Xingbin Shen

Department of Pathology, the Affiliated Hospital of Chengde Medical College, Chengde 067000, China.

Correspondence to: Chunhui Li
E-mail: chli612@yahoo.com.cn

Received February 26, 2007; accepted April 6, 2007.

CJCO <http://www.cjco.cn> E-mail: cocr@eyou.com
Tel(Fax):86-22-2352 2919

KEYWORDS: primary and solitary plasmacytoma, encephalocoele, clinicopathology, diagnosis.

A primary and solitary plasmacytoma with an encephalocoele is an extremely rare tumor^[1]. The origin of plasmacytoma cells has not been clarified, but a number of studies have suggested the possibility that it originates from the meninges and reticular cells of the Virchow-Robin space. Other studies have suggested that plasmacytoma cells may possibly arise from original reticular and stem cells^[2]. In our study of the clinical pathological features and differential diagnosis of our patient with a primary and solitary plasmacytoma with an encephalocoele, biopsy tissue was examined by histopathological and immunohistochemical staining.

Case Report

A 72-year-old woman presented with symptoms of a headache and hypoposia for a period of one month. Examination by computed tomography (CT) revealed a tumor at the base of the skull. Magnetic resonance imaging (MRI) showed there was an irregular soft tissue signal at the base of the skull region, or at the base of the middle cranial fossa. The sphenoidal sinus was infiltrated and a MRI enhancement examination showed that there was one tumor mass, which was defined as a tumor of the middle cranial fossa.

X-rays showed normal bone structure of the thorax, limbs, spine and pelvis. A biopsy of the tumor tissue showed it to be pink and rigid. A chordoid meningioma was considered, as there was no evidence to support the diagnosis of a meningioma. Laboratory examinations reported a normal serum level of globulin and negative urinary Bence Jones protein.

The tumor tissue was fixed in 10% formaldehyde and embedded in paraffin. Sections (5 μ m) were deparaffinated and rehydrated for H&E staining. Assays for Ig kappa light chain, Ig lambda light chain, S-100 protein and glial fibrillary acidic protein (Beijing Zhongshan Biotechnology Co. LTD, China) were conducted on the tumor tissue by a two-step immunohistochemical technique using the Dako- EnVision system. The positive staining for tumor cells was displayed as red-brown granules, which under microscopy were mainly located in the cell cytoplasm. Negative control sections were developed using normal rabbit serum instead of primary antibody.

Macropathology observation

Macropathology observation showed a 5 \times 3 \times 3 cm grayish white,

grayish yellow, rigid tissue.

Histopathological examination following H&E staining

A photomicrograph of the tumor specimen showed oval tumor cells, diffuse proliferation of eccentric globulin and double or triple nuclei. The tissue was composed of monoclonal plasma cells with prominent plasmacytoid features, marked by atypical nuclei and mitotic activity. Small vasculatures of Leydig showed irregular thinness in the tumor tissue. There were scattered infiltrated lymphocytes and hyalosomes in the tumor tissue (Figs. 1A, B).

Immunopathological examination following immunohistochemical staining

Immunohistochemical staining of the neoplastic plasma cells revealed strong and diffuse expression of the Ig kappa light chain and S-100 protein, but negative expression for Ig lambda light chain and glial fibrillary acidic protein. Neoplastic plasma cells were found in the tumor tissue with the positive granules localized to the cytoplasm (Figs. 2A, B, C, D). For a negative control, complete absence of positive staining for neoplastic plasma cells was observed when normal rabbit serum was substituted for the primary antiserum (Fig. 2E). Histological diagnosis of the tumor was plasmacytoma.

Pathologic diagnosis

Encephalic primary and solitary plasmacytoma.

Discussion

Clinical characteristics of an encephalic solitary plasmacytoma

Since one case of an encephalic solitary plasmacy-

toma was identified by A French researchers in 1947, only 20 cases have been subsequently reported in the literature. It is controversial as to whether or not an encephalic solitary plasmacytoma is essentially identical with a solitary plasmacytoma of the bone.

An encephalic solitary plasmacytoma should be examined by X-rays as it is easily misdiagnosed as meningioma. A definitive diagnosis can be made after an evaluation of the clinical characteristics, histological features and immunohistochemical staining results.

Diagnostic characteristics of an encephalic primary and solitary plasmacytoma

(1) A photomicrograph of the tumor specimen showed oval tumor cells, diffusing proliferation of eccentric globulin and double nuclei. It was composed of monoclonal plasma cells; (2) Immunohistochemical staining of the neoplastic plasma cells revealed a strong and diffuse expression of Ig kappa light chain and S-100 protein, but not Ig lambda light chain and glial fibrillary acidic protein; (3) Laboratory examinations found the serum level of globulin was within normal levels. A urine test for the Bence Jones protein was negative; (4) X-ray examinations showed normal bone structure.

Ultrastructural diagnosis of an encephalic primary and solitary plasmacytoma

Electron microscopic studies have demonstrated a lamellar-like structure of the rough surfaced endoplasmic reticulum in the plasmacytoma cell cytoplasm.

Differential diagnosis

(1) Gemistocytic astrocytoma: compared to an encephalic solitary plasmacytoma, a gemistocytic astro-

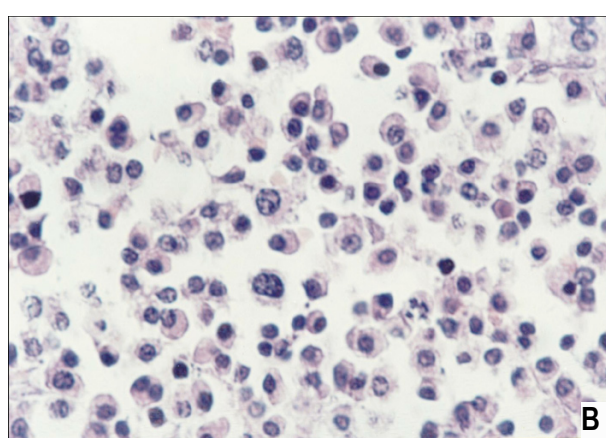
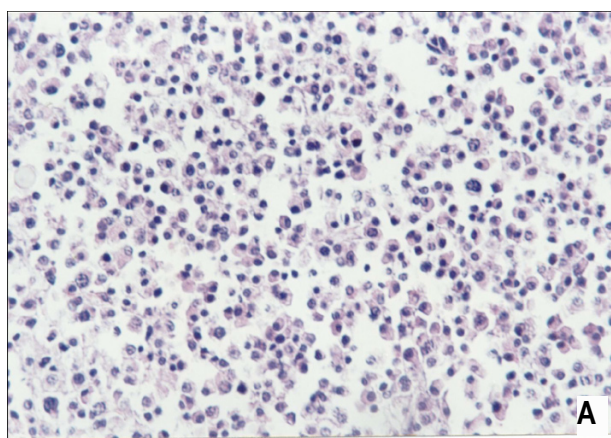


Fig. 1 A. Photomicrograph of the tumor specimen showing homogeneous proliferation of plasmacytoid tumor cells with double or triple nuclei, H&E×200; B. Photomicrograph of the tumor specimen showing homogeneous proliferation of plasmacytoid tumor cells with double nuclei, H&E×400.

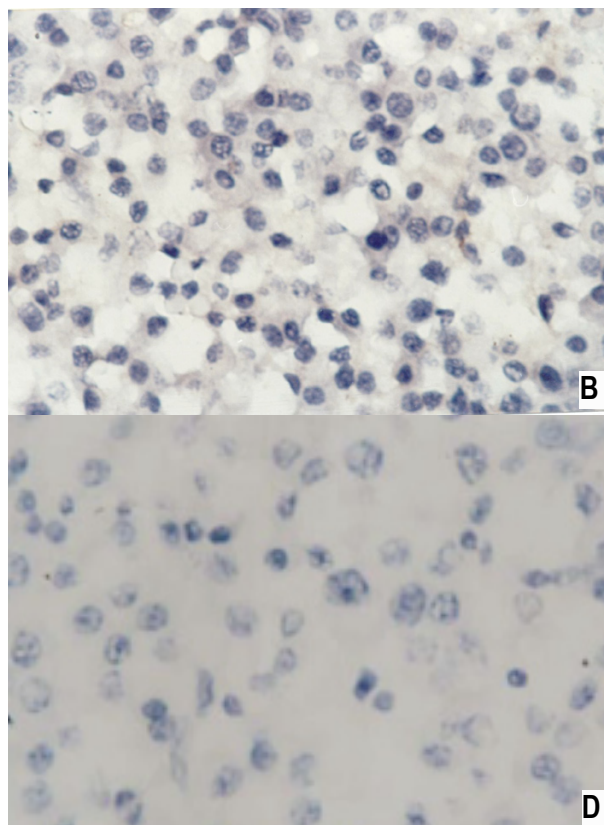
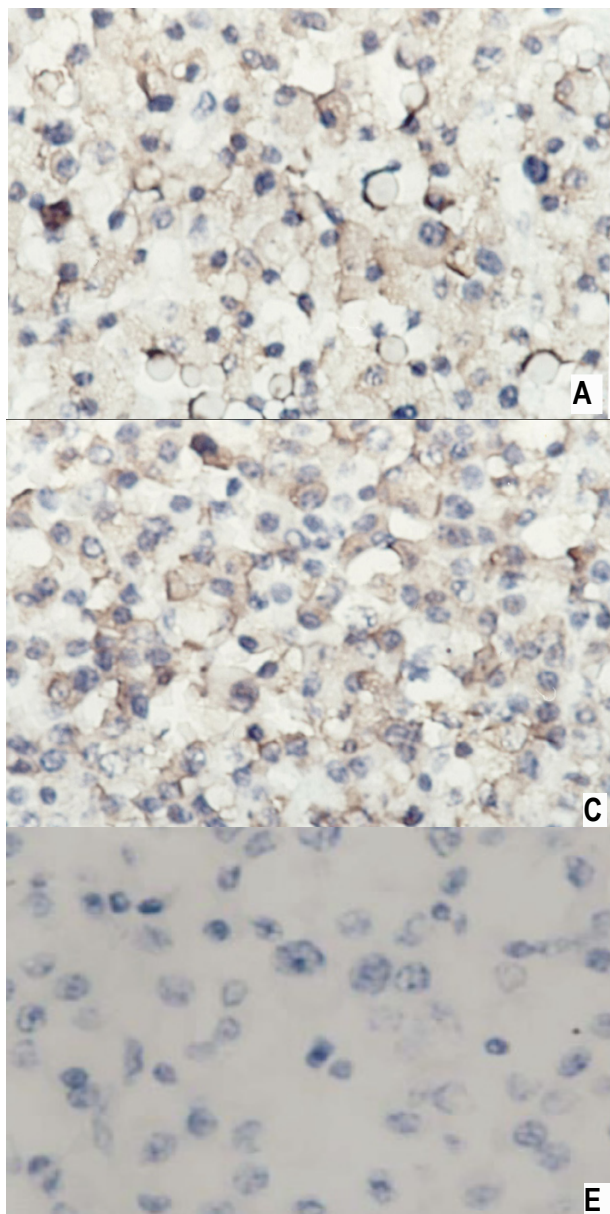


Fig. 2. Immunohistochemical staining, Dako EnVision×400.

A. Diffuse expression of the Ig kappa light chain.
 B. Negative expression of Ig lambda light chain.
 C. Diffuse positive expression of the S-100 protein.
 D. Negative expression of the glial fibrillary acidic protein.
 E. As a negative control, complete absence of staining is observed when normal rabbit serum is substituted for the primary antibody.

cytoma shows immunohistochemical glial fibrillary acidic protein staining of the cytoplasm in most tumor cells, and gemistocytic astrocytomas are found in the brain parenchyma. Primary and solitary plasmacytoma, however, is found in the mesal meninges, and there is invasion of the brain cortex. (2) Plasma cell granuloma: compared to an encephalic solitary plasmacytoma, a histological examination of a plasma cell granuloma shows multiple polymorphic expression under microscopy.

Therapy and prognosis

In the present study, the degree of malignancy and prognosis of the plasmacytoma was uncertain. A number of studies have suggested the possibility that it is an early expression of a myeloma, which will eventually become a myeloma. Also it has been pro-

posed that patients with an apparent encephalic solitary plasmacytoma might have an occult myeloma, whereas other studies have indicated that there is no relationship between an encephalic plasmacytoma and myeloma. We suggest that an encephalic primary and solitary plasmacytoma is a tumor of low malignant degree. Compared to a myeloma, the prognosis is good with radiation therapy and/or a surgical operation^[3,4].

REFERENCES

- 1 Department of Pathology, Tongji Medical University, Department of Pathology, Zhongshan Medical University. Surgical Pathology. 2nd ed. Wuhan: Hubei Science and Technology Publishing House 1999;1238.
- 2 Cheng JX, Lin HL, Lai RQ. Selected Cases of Difficult Pathological Diagnosis. 1st ed. Guangzhou: Guangdong Science and Technology Publishing House 2000; 417.
- 3 Bada H, Maezawa Y, Furusawa N, et al. Solitary plasmacytoma of the spine associated with neurological complications. Spinal Cord 1998;36:470-475.
- 4 Suna D, Erdinçler P, Bayındır C, et al. Intracerebral solitary plasmacytoma. Apropus of a case possibly induced by head injury. Neurochirurgie 1997;43:255-229.