

Tumor-Like Presentation of Organized Chronic Subdural Hematoma

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An organizing hematoma with tumor-like presentation in association with a chronic subdural hematoma (CSDH) has not been reported. Most reported cases of an intracranial mass in association with a CSDH have been associated with primary or metastatic neoplasm. A 72-year-old man presenting with an intracranial contrast-enhancing mass in association with a CSDH in magnetic resonance images is reported. Operative exploration revealed the mass to be an organized hematoma adjoining cortical draining veins between the outer and inner membranes of a chronic subdural hematoma. This report adds another important differential diagnosis to various primary and metastatic neoplasms that have been reported in the literature when encountering an intracranial mass in association with a CSDH. Neurosurgeons should be aware of the possibility and, if necessary, should apply more diagnostic modalities than magnetic resonance images before deciding management plans.

KEY WORDS : Chronic subdural hematoma · Tumor-like lesion · Organized hematoma.

Introduction

Chronic subdural hematomas (CSDHs) are often presented with encapsulated, loculated collections of sanguineous fluid. The association of the CSDHs and intracranial neoplasms has been reported, such as metastasis, meningiomas, sarcomas, and lymphomas^{1-3,5,12,14}.

In the present report, a patient with magnetic resonance (MR) images revealed a round contrast-enhancing tumor-like mass in association with a CSDH which was found to be organized intracapsular hematoma after operation. Therefore, although rare, this report adds another important differential diagnosis to intracranial neoplasms when encountering an intracranial mass in association with a CSDH.

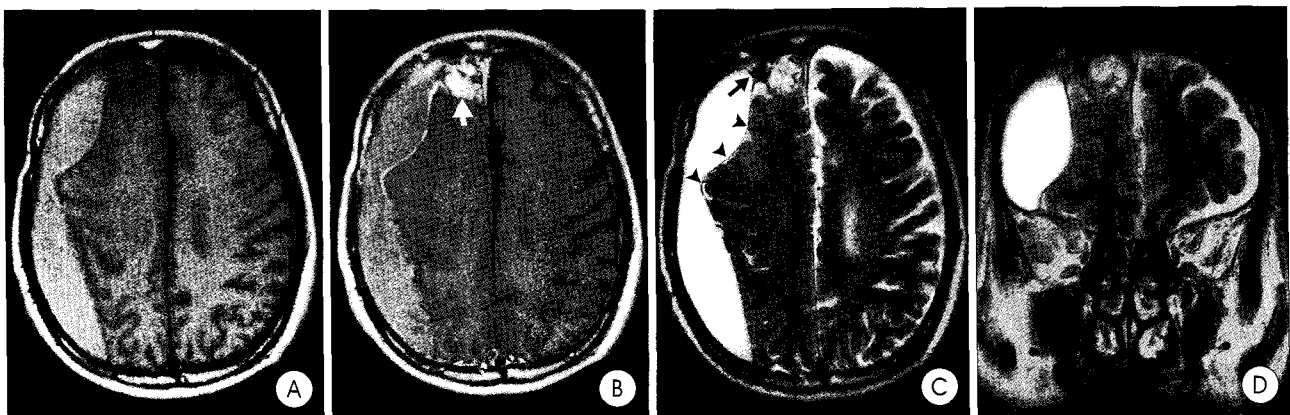


Fig. 1. Magnetic resonance images. A : Axial T1-weighted MR image. B : Gadolinium-enhanced T1-weighted MR image showing a nodular enhancement (arrow) in association with a chronic subdural hematoma. C : Axial T2-weighted MR image demonstrating an organized cortical draining vein (arrow) and a linear low-intensity signal (arrow heads) along the inner membrane of a chronic subdural hematoma. D : Coronal T2-weighted MR image revealing a tumor-like lesion in association with a chronic subdural hematoma.

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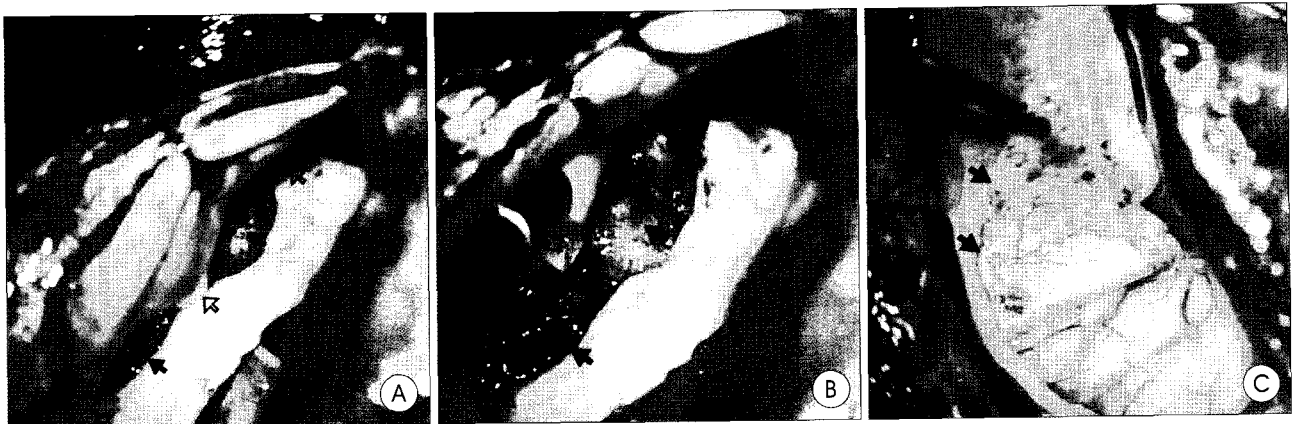


Fig. 2. Intraoperative photographs. A : Dark red fleshy mass (solid arrows) between organized cortical bridging veins (empty arrows). B : Intracranial mass, organized hematoma (solid arrow) with globular appearance after cutting organized cortical draining vein (empty arrow). C : Inner membrane of the chronic subdural hematoma that is incised and flipped over (arrow).

Case Report

History

A 72-year-old man suffering from headache and mild left hemiparesis for a week was presented on January 6, 2004. The patient had suffered from minor head trauma 4 months previously due to a fall, plus had a surgical history of evacuation of bilateral CSDHs by means of burr holes at another institution six years before.

Studies

The routine laboratory examinations including peripheral blood examination, prothrombin time, and activated partial thromboplastin time were within normal limits. However, MR imaging revealed a 2cm-thick fronto-temporo-parietal CSDH on the right. A linear low-intensity signal along the inner membrane of the CSDH was noted in T2-weighted MR images. Associated with this CSDH was a frontal intracranial mass measuring 2cm in diameter in the subdural cavity. It was remarkably enhanced in T1-weighted MR images when using gadolinium enhancement (Fig. 1).

Operation and postoperative course

A right fronto-temporo-parietal craniotomy was performed on the day of presentation. An incision into the dura and outer membrane of the CSDH released a liquid and dark-colored fluid like engine oil. Then, a firm and fleshy globular mass behind organized cortical bridging veins was revealed between the outer and inner membranes of the CSDH (Fig. 2). The postoperative course was uneventful and the patient showed a rapid neurological recovery. Postoperative computerized tomography(CT) scans showed successful removal of the CSDH and the organized hematoma. Follow-up CT scans performed 1 year after the operation did not reveal any recurrent findings.

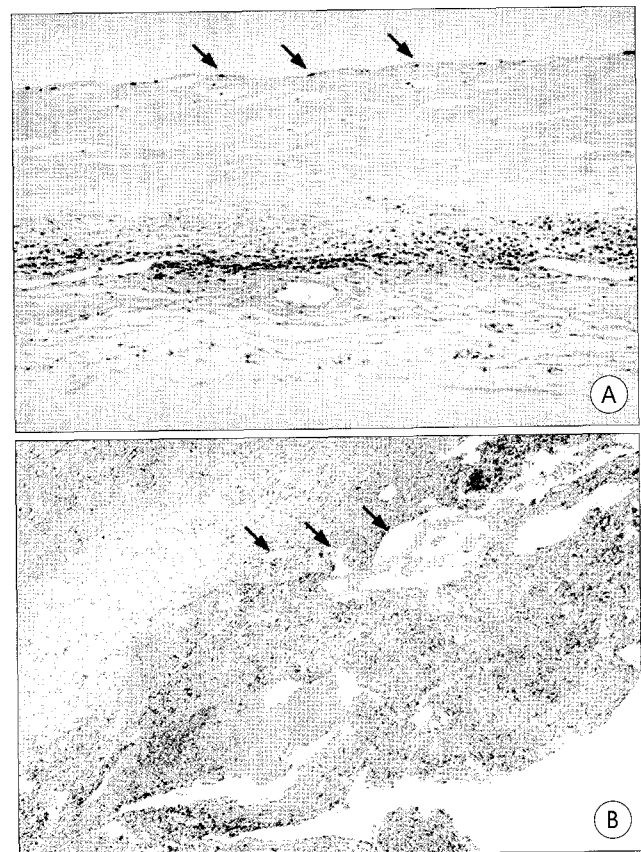


Fig. 3. Histological appearances. A : Inner membrane showing fibrous band-like tissue with focal inflammatory infiltrates and hemosiderin-laden macrophages (arrows). (H & E, Original magnification $\times 200$). B : Organized hematoma demonstrating numerous irregular-shaped new small blood vessels (arrows). (H & E, Original magnification $\times 100$).

Pathological findings

Histologic examination of the mass lesion exhibited an organized hematoma that comprised active neovascularization and infiltration of fibroblasts. The neovascularization was composed of numerous irregular-shaped new small blood vessels

(Fig. 3A). In the meantime, the inner membrane of the CSDH showed fibrous band-like tissue with focal inflammatory infiltrates, mainly lymphocytes, plasma cells, and macrophages. Many hemosiderin-laden macrophages were lined up along the surface of the inner membrane as well (Fig. 3B).

Discussion

As far as is known, an organizing hematoma with tumor-like presentation in association with a CSDH has not been previously reported. Most reported cases of an intracranial mass in association with a CSDH have been neoplastic, including metastasis, meningiomas, sarcomas, and lymphomas^{1-3,5,12,14}. In the meantime, although a CSDH can occasionally occur to organize or even calcify, it does not usually create a nodular or mass-like appearance^{4,6,7,10,11,15}.

The reason why intracapsular hematomas do not organize frequently is due to the local persistent hyperfibrinolytic activity of CSDHs, which include high levels of fibrinolytic factors such as fibrin degradation product, plasmin- α 2-antiplasmin complex, and tissue plasminogen activator^{9,13,16}. Thus, clotted blood, like an island in an ocean of chronic subdural hematoma fluid, liquefies rapidly and does not persist to await organization. However, in the present case, unknown factors prevailing over the hyperfibrinolysis kept the hematoma preserved around the cortical bridging veins, from which bleeding started, and the mesenchymal elements is considered to have derived from the adjacent dura to organize it.

The nodular enhancement in the MR images was caused by active neovascularization in the organized hematoma, while the linear low-intensity signal along the inner membrane of the CSDH was due to hemosiderin-laden macrophages⁸.

Intracranial masses in association with CSDHs could be organized hematomas or neoplastic lesions. Such diagnoses can be granted before deciding management plans and surgical strategies such as craniotomy or burr hole drainage using positron emission tomography or magnetic resonance spectroscopy.

Conclusion

A case of an organized intracapsular hematoma with tumor-like appearance in association with a CSDH is reported.

This case implies another differential diagnosis we should think about before deciding the management plan if there is an intracranial tumor-like lesion in association with a CSDH.

References

- Alimehmeti R, Locatelli M : Epidural B cell non-hodgkin's lymphoma associated with chronic subdural hematoma. *Surg Neurol* 57 : 179-182, 2002
- Baskinis N, Grotenhuis A, Wandt H : Chronic subdural hematoma associated with an intracapsular meningioma. Case report and short review of the literature. *J Neurosurg Sci* 28 : 17-23, 1984
- Bergmann M, Puskas Z, Kuchelmeister K : Subdural hematoma due to dural metastasis. Case report and review of the literature. *Clin Neurol Neurosurg* 94 : 235-240, 1992
- Cho HR, Kim Y, Sim HB, Lyo IU : An organized chronic subdural hematoma with partial calcification in a child. *J Korean Neurosurg Soc* 37 : 386-388, 2005
- Cinalli G, Zerah M, Carteret M, Doz F, Vinikoff L, Lellouch-Tubiana A, et al : Subdural sarcoma associated with chronic subdural hematoma. Report of two cases and review of the literature. *J Neurosurg* 86 : 553-557, 1997
- Golden J, Frim DM, Chapman PH, Vonsattel JP : Marked tissue eosinophilia within organizing chronic subdural hematoma membranes. *Clin Neuropathol* 13 : 12-16, 1994
- Imaizumi S, Onuma T, Kameyama M, Naganuma H : Organized chronic subdural hematoma requiring craniotomy - five case reports. *Neurol Med Chir (Tokyo)* 41 : 19-24, 2001
- Imaizumi T, Horita Y, Honma T, Niwa J : Association between a black band on the inner membrane of a chronic subdural hematoma on T2-weighted magnetic resonance images and enlargement of the hematoma. *J Neurosurg* 99 : 824-830, 2003
- Ito H, Saito K, Yamamoto S, Hasegawa T : Tissue-type plasminogen activator in the chronic subdural hematoma. *Surg Neurol* 30 : 175-179, 1988
- Lee SM, Lee HK, Kim HC : Chronic subdural hematoma with calcification. *J Korean Neurosurg Soc* 17 : 603-607, 1988
- Moon HG, Shin HS, Kim TH, Hwang YS, Park SK : Ossified chronic subdural hematoma. *Yonsei Med J* 44 : 915-918, 2003
- Popovic EA, Lyons MK, Scheithauer BW, Marsh WR : Mast-cell rich convexity meningioma presenting as chronic subdural hematoma. Case report and review of the literature. *Surg Neurol* 42 : 8-13, 1994
- Saito K, Ito H, Hasegawa T, Yamamoto S : Plasmin-alpha 2-plasmin inhibitor complex and alpha 2-plasmin inhibitor in chronic subdural hematoma. *J Neurosurg* 70 : 68-72, 1989
- Scarrow AM, Segal R : Meningioma associated with chronic subdural hematoma. *Acta Neurochir (Wien)* 140 : 1317-1318, 1998
- Sgaramella E, Sorgiu S, Miragliotta G, Fotios FM : "Matrioska head". Case report of calcified chronic subdural hematoma. *J Neurosurg Sci* 46 : 28-31, 2002
- Weir B, Gordon P : Factors affecting coagulation fibrinolysis in chronic subdural fluid collections. *J Neurosurg* 58 : 242-245, 1983