Neuroscience & Medicine, **2013, 4, 277-279**
Published Online December 2013 (http://www.scirp.org/journal/nm)
http://dx.doi.org/10.4236/nm.2013.44040

Anterior Cerebral Infarction by Fronto-Basal Meningioma

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Received August 31st, 2013; revised September 25th, 2013; accepted October 23rd, 2013

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ABSTRACT

The association between stroke and meningioma is rarely reported in the data. In most etiology classification, there is no compressive cause. The association between meningioma and stroke is increasingly reported. We report a case of 52-year-old woman, previously healthy, presented with sudden right hemiplegia with some transient mood disorders. The CT-scan revealed acute left anterior cerebral artery infarction associated with fronto-basale meningioma infiltrating both anterior cerebral arteries. She was treated by corticosteroid and rehabilitation, with partial recovery. No stroke prevention was used before surgical treatment.

Keywords: Infarction; Anterior Cerebral Artery; Meningioma

1. Introduction

Mechanisms and causes of cerebral infarction are well studied and documented in the literature, and usually two mechanisms are identified: hemodynamics and thrombotic or thromboembolic causes [1]. Compressive causes by tumor are not reported in the main etiological classifications as Trial of Org10172 in Acute Stroke Treatment (TOAST) classification and ASCO (atherosclerosis, small vessel disease, cardiac source, other causes) [2]. Meningioma is the second most common primary brain tumor with incidence rates of 3 to 13 cases per 100,000. That incidence increases with female gender and age [3], and it is the most common benign tumor in adult, which is usually manifested by slow progressive signs. The occurrence of stroke associated with meningioma is increasingly reported, but there is no cohort study. We report a case of sudden neurological deficit due to calloso-marginal branch of the anterior cerebral artery infarction associated with infiltrating fronto-basal meningioma.

2. Case

It was a patient of 52 years, with no particular history, admitted to the neurology department for motor deficit of the right side of the body. The examination revealed some transient episodes of mood disorders without headache or vomiting. Physical examination on admission noted a right hemiplegia predominantly on lower limb and the presence of grasping reflexe, without other elements of the frontal lobe involvement. The blood pressure was 135/80 mmHg, regular heart without added noise. The CT scan without injection showed a tumor lesion isodensefrontobasale parenchyma associated with infarction in calloso-marginal territory of the anterior cerebral artery (**Figures 1(A)** and (**B)**). A secondary injection revealed homogeneous contrast enhancement of the lesion characteristic of meningioma. That tumor lesion infiltrates both anterior cerebral arteries (**Figures 1(C)** and (**D)**). Lipid and inflammatory balance, echocardiography, the 24 hours ECG-recording, and echo-Doppler of the supra-aortic trunks founded no abnormalities. It was not possible to make vascular exploration with MRI or angiography. The possible tumor origin of the infarct was selected. The treatment consisted to corticosteroid based on prednisolone 1 mg/kg associated with and motor rehabilitation for 1 month, with partial recovery, then the patient was transferred to neurosurgery department for surgical management, no stroke prevention was conducted before surgery.

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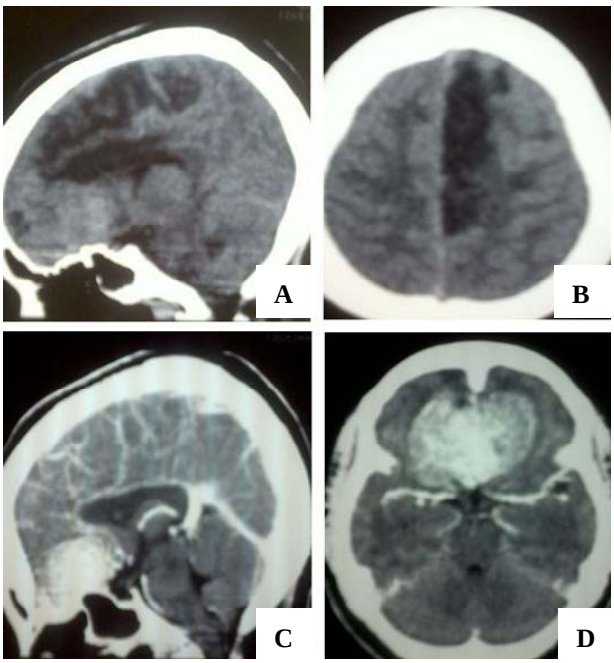

Figure 1. CT scan without injection (A), (B) and injection (C), (D) showing a frontal meningioma infiltrating anterior cerebral artery with infarction in the left calloso marginal artery territory.

3. Discussion

We present the case of meningioma associated to ischemic stroke. The occurrence of stroke in patients with a brain tumor has been described, vascular occlusion is related to either direct compression or vascular infiltration by the tumor, or indirectly by coagulation disorders [4,5]. Meningiomas are the most common benign tumors in adults, and the para sagittal, fronto-basal or skull base localizationare usual as our patient [6,7]. By their location few cases of transient ischemic injury have been reported, Komotar *et al*. [8] estimated to 0.19% the incidence of meningioma related cerebral ischemia by carotid artery compression. The possible pathophysiological mechanism in our case is vascular compression by tumor infiltration, or vascular insufficiency as related in literature [9,10]. Two cases of cerebral infarction by tumor invasion of the internal carotid were reported by Komotar *et al*. [8]. The offending mechanism is was probably a combination of hypoperfusion and thromboembolism. Although common, the fronto-basal location of meningioma is rarely reported as a cause of infarction in the anterior cerebral artery territory. However Lévêque *et al*. [6], in their series of meningiomas of the midline were found 32.7% of the infiltration of the anterior cerebral artery. The anterior cerebral artery occlusion directly due to meningioma was recently documented by Masuoka *et al*., [9]. The management of our patient was not optimal, due to the limitations of radiological explorations and neurosurgery conditions in Congo. Without others contraindications thrombolysis with rt-PA can be used in acute stroke associated to meningioma [11,12] and, in some cases endovascular treatment was used before tumor surgery [10]. In our case, partial recovery of neurological impairment is due to steroid treatment and early rehabilitation, because outcome depend on treatment and early rehabilitation [13].

4. Conclusion

The fronto-basal meningioma is a rare cause of the anterior cerebral infarction, although the compression mechanism is poorly reported due to the very slow evolution and non-invasive nature of the tumor. The vascular insufficiency and hemodynamic change are the most offending mechanisms.

REFERENCES

[1] T. Moulin, "Epidémiologie, Physiopathologie des Accidents Vasculaires Cérébraux Ischémiques," *Journal des Maladies Vasculaires*, Vol. 30, No. Suppl 1, 2005, pp. 5-6. http://dx.doi.org/10.1016/S0398-0499(05)74793-4

[2] W. Y. Shang and J. Y. Liu, "Stroke Subtype Classification: A Comparative Study of ASCO and Modified TOAST," *The Journal of Neuroscience*, Vol. 314, No. 1-2, 2012, pp. 66-70. http://dx.doi.org/10.1016/j.jns.2011.10.029

[3] H. Van Alkemade, M. De Leau, E. M. Dieleman, J. W. Kardaun, R. Van Os, W. P. Vandertop, W. R. Van Furth and L. J. Stalpers, "Impaired Survival and Long-Term Neurological Problems in Benign Meningioma," *Neuro-Oncology*, Vol. 14, No. 5, 2012, pp. 658-666. http://dx.doi.org/10.1093/neuonc/nos013

[4] M. Launay, D. Fredy, J. J. Merland and J. Bories, "Narrowing and Occlusion of Arteries by Intracranial Tumors. Review of the Literature and Report of 25 Cases," *Neuroradiology*, Vol. 14, No. 3, 1977, pp. 117-126. http://dx.doi.org/10.1007/BF00333054

[5] T. N. Kreisl, T. Toothaker, S. Karimi and L. M. DeAngelis, "Ischemic Stroke in Patients with Primary Brain Tumors," *Neurology*, Vol. 70, No. 24, 2008, pp. 2314-2320. http://dx.doi.org/10.1212/01.wnl.0000314648.82924.6f

[6] S. Lévêque, S. Derrey, O. Martinaud, E. Gérardin, O. Langlois, P. Fréger, *et al.*, "Superior Interhemispheric Approach for Midline Meningioma from the Anterior Cranial Base," *Neurochirurgie*, Vol. 57, No. 3, 2011, pp. 105-113. http://dx.doi.org/10.1016/j.neuchi.2011.08.001

[7] M. Ishikawa, S. Nishi, T. Aoki, *et al.*, "Predictability of Internal Carotid Artery (ICA) Dissectability in Cases Showing ICA Involvement in Parasellar Meningioma," *Journal of Clinical Neuroscience*, Vol. 8, No. Suppl 1, 2001, pp. 22-25. http://dx.doi.org/10.1054/jocn.2001.0872

[8] R. J. Komotar, S. C. Keswni and R. J. Wityk, "Meningioma Presenting as Stroke: Report of Two Cases and Es-

timation of Incidence," *Journal of Neurology, Neurosurgery & Psychiatry*, Vol. 74, No. 1, 2003, p. 136. http://dx.doi.org/10.1136/jnnp.74.1.136

[9] J Masuoka, F Yoshioka, H Ohgushi, M Kawashima, T. Matsushima, "Meningioma Manifesting as Cerebral Infarction. Case Report," *Neurologia Medico-Chirurgica* (*Tokyo*), Vol. 50, No. 7, 2010, pp. 585-587. http://dx.doi.org/10.2176/nmc.50.585

[10] F. Fernandez-Valverde, E. Jimenez-Gomez, E. Roldan-Romero and F. Bravo-Rodriguez, "Presurgical Endovascular Treatment of Symptomatic Carotid Stenosis Caused by a Meningioma of the Planumsphenoidale," *Revue Neurologique*, Vol. 56, No. 3, 2013, pp. 157-160.

[11] R. F. Baiense, A. Abrahão, I. F. Ricarte, T. G. Fukuda, R. A. Oliveira, G. S. Silva, M. Costa and M. J. Teixeira, "Successful Intra-Arterial Thrombolysis in a Patient with an Intracranial Meningioma," *Journal of Stroke and Cerebrovascular Diseases*, 2013, in press.

[12] T. Etgen, I. Steinich and L. Gsottschneider, "Thrombolysis for Ischemic Stroke in Patients with Brain Tumors," *ournal of Stroke and Cerebrovascular Diseases*, 2013, in press.

[13] M. Bartolo, C. Zucchella, A. Pace, G. Lanzetta, C. Vecchione, M. Bartolo, G. Grillea, M. Serrao, C. Tassorelli, G. Sandrini and F. Pierelli, "Early Rehabilitation after Surgery Improves Functional Outcome in Inpatients with Brain Tumours," *Journal of Neuro-Oncology*, Vol. 107, No. 3, 2012, pp. 537-544. http://dx.doi.org/10.1007/s11060-011-0772-5