Case Reports

Recurrent Cerebral Infarction Due to Benign Uterine Myoma

Eiko Higuchi, MD,* Sono Toi, MD, PhD,* Yuka Shirai, MD,* Satoko Mizuno, MD,* Hiromi Onizuka, MD,† Yoji Nagashima, MD, PhD,† Kazunori Hashimoto, MD, PhD,‡ and Kazuo Kitagawa, MD, PhD*

The hypercoagulable state in patients with cancer has been shown to be closely associated with ischemic stroke. However, it is unlikely that benign tumors are related to stroke. The development of benign uterine tumors is common in middle-aged women. Previous studies have shown cases of ischemic stroke with benign uterine tumor, but the causal relationship between these 2 remain unknown. We report a case of recurrent ischemic stroke in a middle-aged woman who had a benign uterine tumor. After excision, there was no recurrence for 2 years. Microemboli detection, clinical course and histological findings support a relationship between uterine tumor and ischemic stroke.

Key Words: Recurrent stroke—uterine myoma—transcranial Doppler—microemboli

Case Report

Hypercoagulable state in patients with cancer has been shown to be closely associated with ischemic stroke.[1] Although several studies have shown cases of ischemic stroke with uterine tumor,[2,3] causal relationship remain unknown.

A 43-year-old woman had experienced ischemic stroke 4 times since she had diagnosis of uterine myoma at 40 years old. After the first onset of ischemic stroke, several antithrombotic therapy including warfarin, clopidogrel, and aspirin were tried, but she repeated cerebral infarction. She was referred to our hospital immediate after the onset of fifth stroke. After she suddenly complained of vertigo, MRI showed multiple acute (Fig 1, A) and old infarctions (Fig 1, B). No occlusive lesions in intracranial artery were found in MR angiography (Fig 1, C). No atherosclerotic lesion or atrial fibrillation was found in carotid ultrasonography and 24 hour ECG monitoring. However, in Transcranial Doppler ultrasound monitoring of right middle cerebral artery, there were microemoli signals (MES) (Fig 1, D). Her blood examination showed slight anemia (Hb 10.5 g/dL), but the number of platelet was within normal range. Plasma D-dimer (1.8 μg/mL) was moderately high. Activity of protein S and protein C were normal, and antiphospholipid antibody was negative. No pathological findings were found in transesophageal echocardiography (Fig 1, E). We concluded that uterine myoma was the only condition that causes stroke recurrence in this patient. We referred her to gynecology, and she received total hysterectomy. After removal of myoma uterus, MES disappeared, plasma D dimer levels returned to the normal range, and her anemia was improved (Hb 13.0 g/dL). She has passed without a recurrence for 2 years. The size of uterus was 165 × 120 × 70 mm, weighing 845 g (Fig 1, F). The histopathological image was leiomyoma, and was not malignant growth (Fig 1, G). Mast cells within the leiomyoma expressed tissue factor (Fig 1, H).

From the *Department of Neurology, Tokyo Women's Medical University Hospital, Tokyo, Japan; †Department of Surgical Pathology, Tokyo Women's Medical University Hospital, Tokyo, Japan; and ‡Department of Gynecology, Tokyo Women's Medical University Medical Center East, Tokyo, Japan.

Received July 18, 2018; revision received September 11, 2018; accepted September 17, 2018.

Address correspondence to Eiko Higuchi MD and Kazuo Kitagawa, MD, PhD, Department of Neurology, Tokyo Women's Medical University Hospital, 8-1 Kawada-cho, Shinjuku-ku, Tokyo 162-8666, Japan. E-mails: azure.rapture.02@gmail.com, kitagawa.kazuo@twmu.ac.jp.

1052-3057/$ - see front matter

https://doi.org/10.1016/j.jstrokecerebrovasdis.2018.09.034

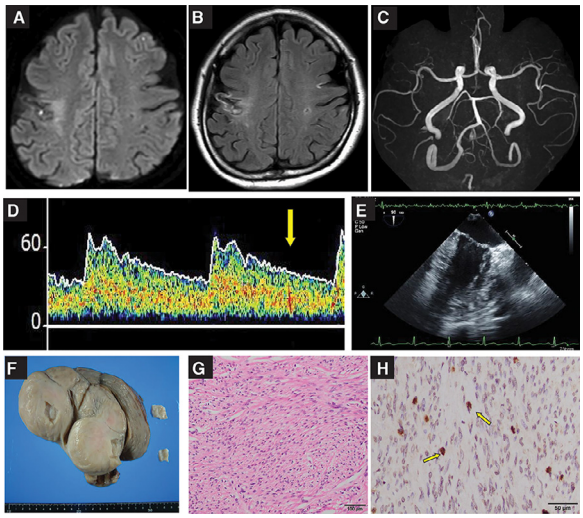

Figure 1. *(A) Diffusion weighted imaging (B) FLAIR imaging (C) MR angiography; (D) transcranial Doppler (microembolic signal was shown as an arrow); (E) transesophageal echocardiography; (F) resected specimen of myoma uterus; (G) hematoxylin eosin staining; (H) immunohistochemistry with antihuman tissue factor antibody (REF 4509, Sekisui Diagnostic, LLC, Stanford, CT). Arrows indicate expression of tissue factor in mast cells within leiomyoma.*

Discussion

In this case, uterine myoma could cause coagulopathy. Transesophageal echocardiography did not show any vegetation as a sign of nonbacterial endocarditis, but rate of detection in valve vegetation is only 18%.[4] Both increase in plasma D dimer level and positive MES showed hypercoagulability in this patient as shown in cancer patients.[5] Expression of tissue factor in leiomyoma (Fig 1, H) might be involved in coagulopathy. Tissue factor is considered a cause of cancer-related coagulopathy.[1] There are several other possible mechanisms underlying ischemic stroke in this patient. Uterine myoma may have mechanical compression in the vein in the pelvic organ, and deep vein thrombus may enter in systemic circulation. However, this is highly unlikely in this patient because no patent foramen ovale or thrombus in the pelvic organ was found. Next, it is possible that uterine myoma causes anemia and increased circulating platelet numbers, leading to arterial thrombosis. This condition is unlikely in this patient because the level of anemia was very mild, and platelet numbers were within the reference range. In conclusion, uterine myoma would be considered a potential embolic source in middle-age female stroke patients with unknown mechanisms.

Informed Consent

The patient provided written informed consent for publication of this report.

References

1. Varki A. Trousseau's syndrome: multiple definitions and multiple mechanisms. Blood 2007;110:1723-1729.
2. Srivatsa A, Burdett J, Gill D. A 35-year-old woman with uterine fibroids and multiple embolic strokes. Neurology 2005;64:1479-1480.
3. Tadokoro Y, Sakaguchi M, Yagita Y, et al. Ischemic stroke in patients with solid gynecologic tract tumors and coagulopathy. Eur Neurol 2013;70:304-307.
4. Dutta T, Karas MG, Segal AZ, et al. Yield of transesophageal echocardiography for nonbacterial thrombotic endocarditis and other cardiac sources of embolism in cancer patients with cerebral ischemia. Am J Cardiol 2006;97:894-898.
5. Seok JM, Kim SG, Kim JW, et al. Coagulopathy and embolic signal in cancer patients with ischemic stroke. Ann Neurol 2010;68:213-219.