Eagle’s syndrome is caused by an elongated styloid process or calcified stylohyoid ligament that interferes with adjacent structures. Herein, we present the case of a 26-year-old man who presented to the emergency department due to sudden onset pain in the right occipital area, dysarthria, left hemiparesis, and left arm paresthesia. Computed tomography (CT) angiography revealed an intimal flap and thrombus in the proximal right internal carotid artery (ICA), indicative of carotid artery dissection, as well as direct contact between the styloid process and ICA on both sides. The patient underwent anticoagulation with intravenous heparin for 7 days, followed by 75 mg of clopidogrel per day. Following treatment, the patient gradually improved and was discharged with slight paresthesia in the left arm two weeks after symptom onset. Carotid artery dissection is a rare manifestation of Eagle’s syndrome caused by an elongated styloid process.

CASE

A 26-year-old man presented to the emergency department due to sudden onset of pain in the right occipital area, dysarthria, left hemiparesis, and left arm paresthesia. His National Institutes of Health Stroke Scale (NIHSS) at admission was 3. His medical history was unremarkable, except for a 5-year history of cigarette smoking and a habit of repetitively turning his head from side to side due to neck discomfort. Diffusion-weighted brain magnetic resonance imaging revealed an acute multifocal infarction in the border zone between the right middle and anterior cerebral arteries (Fig. 1A). Initial computed tomography (CT) angiography further revealed an intimal flap and of the styloid process with elongation and proximity to the carotid artery.
thrombus in the proximal right internal carotid artery (ICA), suggestive of carotid artery dissection, in addition to direct contact between the styloid process and the ICA on both sides (Fig. 1B, C). Additionally, the bilateral styloid processes were found to be elongated, measuring 39.2 mm and 31.2 mm on the right and left sides, respectively. Right common carotid angiogram confirmed acute dissection of the right ICA with an intimal flap and thrombus in the false lumen (Fig. 1D). We initially planned to perform endovascular treatment with a stent for carotid artery dissection, but the patient refused endovascular stenting. Thereafter, the patient was anticoagulated with intravenous heparin for 7 days, followed by 75 mg of clopidogrel per day. The patient’s condition gradually improved following treatment, and he was discharged with slight paresthesia in the left arm two weeks after symptom onset. We discussed surgical excision of the styloid process with an otorhinology specialist, and decided to withhold the operation unless the patient had new symptoms. The patient avoided excessive head bending and remained neurologically intact at the 4-year follow-up visit.

**DISCUSSION**

The styloid process is a bony structure projecting from the temporal bone which is anatomically adjacent to the internal and external carotid arteries, internal jugular vein, and the cranial nerves V, IX, X, and XII. Although anatomical variations in the styloid process have been observed in the general population, a styloid process longer than 30 mm is generally defined as elongated, and is considered to be responsible for the symptoms of eagle syndrome. Additional anatomical factors of the styloid process, including its proximity to the carotid artery, angulation, and width, may contribute to the occurrence of the syndrome. Previous studies have further shown that carotid artery dissection, a rare complication of stylocarotid artery syndrome, is statistically associated with a styloid process which is elongated or exceptionally close to the carotid artery. CT with three-dimensional reformations is a valuable imaging tool that accurately demonstrates the anatomy of the styloid process and its adjacent structures. Eagle’s syndrome can be managed conservatively or surgically based on symptom severity. To date, no definite guidelines have yet been established for the treatment of stylocarotid artery syndrome with a secondarily dissected carotid artery. Recanalization therapies, such as endovascular treatment, may be considered according to the management guidelines for acute ischemic stroke. Furthermore, surgical excision of the elongated styloid process, using an intraoral or extraoral approach, may be necessary to prevent recurrences. In the present case, the patient improved after medical treatment and remained symptom-free at the 4-year follow-up visit. Carotid artery dissection is a rare manifestation of Eagle’s syndrome caused by an elongated styloid process. Conservative medical treatment can be applied for the initial management and education to avoid excessive neck turning.

**Ethics Statement**

Written informed consent was obtained from the patient to report demographic data, medical conditions, neuroimaging, and treatment.
Availability of Data and Material
The datasets generated or analyzed during the study are available from the corresponding author upon reasonable request.

Author Contributions
All authors have read and approved the manuscript. Writing the initial draft of the manuscript: SMS, YJK. Conceptualization and supervision: SMS, YJK. Medical management of the case: SMS, YJK, THL. Critically revising the manuscript and literature review: YJK, SMS, HJC, THL.

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Conflicts of Interest
No potential conflicts of interest relevant to this article were reported.

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