Multiple Arteriosclerotic Fusiform Aneurysms of the Superficial Temporal Artery
—Case Report—

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Abstract
Superficial temporal artery (STA) aneurysms are very rare, and usually occur in young adult men due to blunt trauma as pseudoaneurysms. An 85-year-old male presented with two non-traumatic STA aneurysms. The aneurysms were ligated and resected. Histological examination showed arteriosclerotic fusiform aneurysm. The pathogenesis of non-traumatic aneurysm of the STA appears to be arteriosclerotic change and/or hemodynamic stress.

Key words: superficial temporal artery, aneurysm, arteriosclerosis

Introduction
Superficial temporal artery (STA) aneurysm is extremely rare, with only 200 reported cases.\textsuperscript{1,3,9} Analysis of 174 cases found that 80% occurred in young adult males (mean age 33 years), 75% were secondary due to blunt trauma, and most patients presented within 2 to 6 weeks after injury.\textsuperscript{10} The frontal and preauricular branches of the STA are the most frequent locations.\textsuperscript{2,30} We recently treated an elderly patient with multiple non-traumatic aneurysms of the STA which were found to be arteriosclerotic fusiform aneurysms.

Case Report
An 85-year-old male visited our hospital because of a painless pulsative mass in the area anterolateral to the right tragus (Fig. 1). He had first recognized this subcutaneous mass one year previously. He had no evidence of head or face injury. The mass was round, about $3 \times 3$ cm in diameter, and was reduced in size when the point of the inferior portion was compressed. No bruit or facial nerve paresis were detected. He had a history of hypertension and arrhythmia for 20 years.

Laboratory studies and cranography showed no abnormalities. Computed tomography (CT) revealed a round isodense mass lesion in the right temporal muscle, which was markedly enhanced by contrast medium. Right external carotid arteriography showed two aneurysms in the main trunk and the frontal branch of the right STA (Fig. 2). Neither aneurysm was located at the bifurcation. There was no pooling of contrast medium in the aneurysms, which suggested pseudoaneurysm or dissection.
nation revealed $10 \times 10 \text{ mm}$ and $3 \times 3 \text{ mm}$ aneurysms with three layers of blood vessel wall. The aneurysmal wall contained arteriosclerotic intimal thickening with atheroma formation. The final diagnosis was multiple arteriosclerotic fusiform aneurysms (Fig. 3).

**Discussion**

In contrast to previous cases, our patient was aged 65 years and had not suffered any incident of head trauma. Histological examination of the STA aneurysms found the arterial wall had three layers, and showed signs of arteriosclerotic change.\(^\text{10}\)

Intracranial aneurysms are generally caused by congenital absence of wall structures and/or acquired hemodynamic stress.\(^\text{10}\) In contrast, most STA aneurysms are associated with traumatic accidents causing injury of the arterial wall.\(^\text{4,8,10}\) Therefore, the cause of STA aneurysm is commonly accepted as dissection of the arterial wall due to the injury.\(^\text{4,6,8,10}\) Several types of blunt injury have been reported, involving baseball, basketball, hockey stick, and fist injury.\(^\text{1,4,6}\) STA-middle cerebral artery anastomosis may also cause injury to the artery.\(^\text{6}\) The STA is vulnerable to injury because the temporal muscle is the only protective tissue between the STA and the skull.\(^\text{1,5,8}\) Pseudoaneurysm develops from damage to the structures of the arterial wall with subsequent hematoma formation and eventual organization to form a connective tissue sac.\(^\text{8}\) The pathogenesis of STA aneurysm is similar, as the traumatic injury may cause contusion of the artery with subsequent wall necrosis, leading to the development of the false aneurysm (traumatic pseudoaneurysm).\(^\text{4}\)

Fusiform aneurysm is a localized or diffuse dilatation of an artery involving the intima, media, and adventitia. Fusiform aneurysm commonly occurs in the basilar artery and internal carotid artery.\(^\text{8,13}\) Idiopathic aneurysms of the STA without history of head injury have been found in only 12 cases including our case.\(^\text{7}\) The mechanism of development of fusiform aneurysm is unknown, but may involve atherosclerotic change or hemodynamics.\(^\text{5,7,12}\) Our patient had a long history of hypertension and the aneurysms of the STA showed severe arteriosclerotic change. Therefore, arteriosclerotic change of the STA and/or hemodynamic stress to the arterial wall might have caused the true aneurysm of the STA. Our case is the first reported case of multiple fusiform aneurysms of the STA.

Clinical diagnosis of STA aneurysm is not difficult.\(^\text{4,10}\) The lesions will be pulsative, and cause audible bruit. CT, Doppler examination (B-mode ultrasound), and magnetic resonance imaging are

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**Fig. 2** Selective angiogram of the right superficial temporal artery (STA), lateral view, showing two aneurysms in the main trunk (arrow) and the frontal branch (arrowhead) of the STA.

**Fig. 3** A: Photograph of the surgical specimen. B: Photomicrograph showing the thickened aneurysmal wall (the larger aneurysm) with arteriosclerotic intimal thickening and thrombotic atheroma (t) formation. HE stain, $\times 200$. C: Photomicrograph of the aneurysmal wall (the larger aneurysm) showing thickened intima (i), media (m), and adventitia (a). The histological diagnosis is arteriosclerotic fusiform aneurysm. Elastica van Gieson stain, $\times 400$.

aneurysm. The diagnosis was extracranial STA aneurysms.

The two aneurysms were surgically ligated and resected without complications. The patient was discharged 8 days after surgery. Histological exami-
useful for the diagnosis, but the most important examination is selective angiography.

The natural history of STA aneurysms is unknown. Symptoms include intractable headache, regional hematoma due to spontaneous rupture of the STA aneurysm, and intolerable bruit. Treatment includes conservative treatment, surgery, or selective catheterization with embolization. Surgical intervention is preferred because the surgical approach is not difficult, and can prevent rupture or recurrence.

References


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