

## CASE REPORTS

# Vertebrobasilar insufficiency by persistent trigeminal artery stenosis

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### Abstract

Persistent trigeminal artery is an embryonic remnant of the anastomotic channel linking the internal carotid artery and the basilar artery. Cases of vertebrobasilar insufficiency caused by the persistent trigeminal artery with internal carotid artery stenosis has been described previously, but vertebrobasilar insufficiency entirely due to in situ stenosis of the persistent trigeminal artery has not been reported. A 71-year-old man presented with frequent dizzy episodes. The brain MRI showed no parenchymal lesions. MR angiography showed poor visualization of vertebrobasilar system. He was diagnosed as having vertebrobasilar insufficiency. Cerebral angiography revealed that there was complete occlusion at the vertebrobasilar junction, and the basilar artery was supplied by the persistent trigeminal artery which had severe stenosis at its origin. There was no stenosis of the internal carotid artery of both sides. We believe that this is the first report of vertebrobasilar insufficiency due to stenosed persistent trigeminal artery, without internal carotid artery stenosis.

### INTRODUCTION

Persistent trigeminal artery (PTA) is an embryonic remnant of the anastomotic channel linking the internal carotid artery (ICA) and the basilar artery (BA).<sup>1</sup> It has been documented in the literature that the PTA is associated with cerebral aneurysm<sup>2</sup>, carotid-cavernous fistula<sup>3</sup> and cranial nerve dysfunction.<sup>4</sup> With respect to cerebral infarction, microemboli originating at an ulcerative lesion of the carotid artery traveling through the PTA are known to cause ischemic stroke involving the brainstem.<sup>5</sup> Lacunar and cardioembolic infarctions associated with the PTA have also been reported.<sup>5,6</sup> There have also been reports of vertebrobasilar insufficiency (VBI) attributed to PTA (Table 1).<sup>7-14</sup> Most of the later cases have concurrent ICA stenosis. We describe here for the first time, a patient whose VBI was entirely due to in situ stenosis of PTA.

### CASE REPORT

A 71-year-old man with past history of hypertension and dyslipidemia presented with recurrent episodes of dizziness. The episode lasted for several minutes and was associated

with visual blurring and tinnitus. A neurologic examination revealed no focal signs. MRI showed no parenchymal lesions. The BA was poorly visualized on MR angiography, and there was no stenosis of the both ICAs. Cerebral angiography subsequently performed revealed a complete occlusion at the vertebrobasilar junction (Figure 1). The BA was supplied by the left ICA via the PTA with severe stenosis at its origin (Figure 1). The patient was diagnosed to have VBI. He was treated with antiplatelet agents and other medications, with good control of the VBI symptoms.

### DISCUSSION

As mentioned above, previous cases of VBI with the PTA were mostly caused by stenosis of the ICA (Table 1).<sup>10-14</sup> In some cases, there were ICA stenosis combined with PTA stenosis. The hemodynamic impact of the PTA has been reported not to be significant in patients with occlusive cerebrovascular disease, because of the relatively competent posterior communicating artery, which is present in the majority of individuals with or without the PTA.<sup>15</sup> In our

**Table 1: Previous reports of patients with persistent trigeminal artery presenting with vertebrobasilar insufficiency**

Author	Year	Age/Sex	Clinical manifestation	Stenosis of the persistent trigeminal artery	Stenosis of the relevant internal carotid artery
Harrison <i>et al.</i> <sup>7</sup>	1953	32/F	Syncopal attack	Data not available	Data not available
Bingham <i>et al.</i> <sup>8</sup>	1961	49/M	Drop attack	No	No
Debaene <i>et al.</i> <sup>9</sup>	1972	Data not available	Described as vertebrobasilar insufficiency only	Data not available	Data not available
Waller <i>et al.</i> <sup>10</sup>	1977	54/M 62/F	Facial numbness and weakness Facial numbness and visual blurring	Yes No	Yes Yes
Stern <i>et al.</i> <sup>11</sup>	1978	68/F	Vertigo and visual blurring	No	Yes
Palmer <i>et al.</i> <sup>12</sup>	1981	62/F	Transient visual loss	No	Yes
Hirashima <i>et al.</i> <sup>13</sup>	1988	69/F	Vertigo	Yes	Yes
Battista <i>et al.</i> <sup>14</sup>	1997	65/F	Vertigo	No	Yes
Park <i>et al.</i> <sup>*</sup>	2012	71/M	Dizziness and visual blurring	Yes	No

\* indicates the current study.

patient, the vertebrobasilar junction was occluded and posterior communicating arteries were incompetent. There was also in situ stenosis of the PTA. The patient did not have any stenosis of the ICA of both sides. To our knowledge, this is the first report of PTA stenosis which acts as a cause of VBI in the absence of the relevant ICA stenosis.

## DISCLOSURE

Conflict of interests: None



Figure 1. Conventional angiography of the patient with vertebrobasilar insufficiency and severe stenosis of persistent trigeminal artery (PTA). (A). Lateral view of left vertebral angiography revealing a complete occlusion at the vertebrobasilar junction. (B). Lateral view of left internal carotid angiography showing PTA which is filling basilar artery (black arrow). (C). Three-dimensional reconstruction of internal carotid angiography demonstrating severe stenosis of PTA (white arrow).

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