Emergence of Persistent Primitive Trigeminal Artery into Posterior Cranial Fossa via an Unusually Caudal Site

M. Ide, M. Jimbo, M. Yamamoto, and S. Hagiwara

Department of Neurosurgery, Tokyo Women's Medical College Dai-ni Hospital, Tokyo, Japan

Introduction

As there have been few detailed reports of autopsy cases or intra-operative observations, anatomical knowledge concerning the detailed course of the persistent trigeminal artery (PPTA) has been limited. The site at which a PPTA emerges into the posterior cranial fossa (dural foramen of PPTA) has rarely been documented in a craniocaudal dimension. We report a PPTA case, in whom the vessel emerged from an unusual site in the posterior fossa, which has not previously been described.

Case Report

A 63-year-old man was admitted to our facility with complaints of headache and nausea after minor head trauma. He had a one-year history of gait disturbance. Neurological examination revealed right-sided deafness and remarkable cerebellar ataxia. Computed tomography and magnetic resonance imaging demonstrated a cystic tumour in the right cerebellopontine angle cistern. As there was a fluid level within the cyst, suggesting intracystic haemorrhage, cerebral angiography was performed to determine whether the haemorrhage was attributable to a concurrent vascular abnormality. However, there was no abnormal vasculature which could have caused the haemorrhage, but a PPTA was discovered on the left side. This artery originated from the junction of the C4-5 portion of the left internal carotid artery and coursed posteromedially to join the basilar artery. Both superior cerebellar arteries were filled by this artery.

At operation, the tumour was completely resected using a right lateral suboccipital approach. During resection of the tumour, we identified an anomalous yellowish artery, the PPTA, perforating the dura on the clivus and entering the posterior cranial fossa, medial to and at the level of Dorello's canal. The dural foramen of the PPTA was situated inferomedial to the right porus trigeminus for approximately 13 millimeters. The distance between Dorello's canal and the dural foramen of the PPTA was approximately five millimeters (Fig. 1). Histology was consistent with an Antoni type B neurinoma with haemosiderin deposition. Postoperatively, the



Fig. 1. Operative view after total resection of the acoustic tumour, demonstrating a persistent primitive trigeminal artery (*PPTA*) perforating the dura of the clivus, medial to Dorello's canal (*DC*) on the right side. The dural foramen of the PPTA was approximately 13 millimeters inferomedial to the right porus trigeminus. The distance between DC and the dural foramen of the PPTA was approximately five millimeters. The PPTA ran inferiorly for a few millimeters and then turned superiorly to join the basilar artery. The basilar artery (*BA*) actually appeared to originate from this point, since the intracranial vertebral arteries were absent on both sides. *CN V* trigeminal nerve, *CN VI* abducens nerve, *CN VII* facial nerve (preserved), *DF* dural foramen of the PPTA, *S* suction

patient's cerebellar ataxia has gradually improved and he was discharged after a one-month rehabilitation programme.

Discussion

PPTA have usually been classified into two types in relation to the dorsum sellae: medial type and lateral type [2, 3]. The PPTA in our case is considered to be the medial type, as it perforated the dura mater medial to Dorello's canal. In either type, the PPTA generally M. Ide et al.: Emergence of Persistent Primitive Trigeminal Artery

penetrates the dura mater and enters the posterior fossa nearly at the level of the trigeminal nerve root in the supero-inferior dimension [1, 4, 5]. The location of the dural foramen of PPTA observed in this case was considered to be somewhat inferior, as compared to previously reported cases [1, 4, 5]. The present case suggests that a PPTA can penetrate the dura mater at various levels on the clivus, possibly depending on the length of the extradural course of the PPTA on the clivus [5]. Since pre-operative cerebral angiography is no longer an acceptable diagnostic procedure for patients with certain presumed tumours, the surgeon may occasionally encounter an unexpected vascular anomaly intra-operatively and should thus be familiar with the detailed regional neurovascular anatomy, including the potential for aberrant location of structures.

References

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Correspondence: Dr. M. Ide, Department of Neurosurgery, Tokyo Women's Medical College Dai-ni Hospital, 2-1-10 Nishiogu, Arakawa-ku, Tokyo 116, Japan.