

Trigeminal neuralgia associated with persistent primitive trigeminal artery

Neuralgia trigeminal associada a artéria trigeminal primitiva

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ABSTRACT

The trigeminal neuralgia or tic douloureux is a frequent painful condition in which the pathophysiological mechanism is poorly understood. Trigeminal neuralgia is sometimes described as the most excruciating pain known to humanity. It is the most common cause of neuralgic facial pain in the geriatric population. The vast majority of the cases of trigeminal neuralgia are considered idiopathic. In around 1% of the patients with trigeminal neuralgia, a structural lesion is disclosed during the neuroimaging evaluation, mainly in the region of the trigeminal nerve path from the brainstem to its entrance in the skull base. In such cases, either a tumor or a vascular compression over the nerve is considered the etiological agent. In the literature, a few cases of trigeminal neuralgia have been reported in association with persistence of the primitive trigeminal artery. This article intends to present a case of a woman with trigeminal neuralgia in whom the presence of the primitive trigeminal artery (PTA) was disclosed during the investigation.

Key words: Trigeminal neuralgia; pain; primitive trigeminal artery.

RESUMO

A neuralgia trigeminal é uma condição dolorosa freqüente ainda com seu mecanismo fisiopatogênico pouco conhecido. A dor da neuralgia do trigêmeo é descrita muitas vezes como a pior dor possível que um ser humano pode ter. É a causa mais comum de dor facial na população geriátrica. Na sua grande maioria é considerada idiopática. Em cerca

de 1% dos pacientes com neuralgia trigeminal uma lesão estrutural é encontrada nas proximidades do nervo trigêmeo durante investigação por neuroimagem. Em tais casos, um tumor ou anormalidades vasculares são encontradas comprimindo o nervo na sua origem no tronco encefálico. Na literatura, poucos casos de pacientes com neuralgia do trigêmeo associada com persistência da artéria trigeminal primitiva foram descritos. Neste artigo descrevemos o caso de uma mulher com neuralgia trigeminal bilateral que durante a investigação houve o encontro de uma artéria trigeminal primitiva persistente.

Palavras-chave: Neuralgia do trigêmeo; dor; artéria trigeminal primitiva.

INTRODUCTION

The trigeminal neuralgia or tic douloureux is a frequent painful condition (annual incidence of 1-4 per 100,000 persons) in which the pathophysiological mechanism is poorly understood. Trigeminal neuralgia is sometimes described as the most excruciating pain known to humanity. It is the most common cause of neuralgic facial pain in the geriatric population. The vast majority of the cases of trigeminal neuralgia are considered idiopathic. In around 1% of the patients with trigeminal

neuralgia, a structural lesion is displaced during the neuroimaging evaluation, mainly in the region of the trigeminal nerve path from the brainstem to its entrances in the skull base. In such cases, either a tumor or a vascular compression over the nerve is considered the etiological causal agent. In the literature, a few cases of trigeminal neuralgia have been reported in association with the persistence of the primitive trigeminal artery (PTA).¹⁻⁵

The most common cause of idiopathic trigeminal neuralgia are tortuous arteries in the prepontine space which compresses the trigeminal nerve. The superior cerebellar artery, the inferior cerebellar artery, and the basilar artery are the most frequent vessels found in contact with the nerve. Rarely the nerve is traumatized by an enlarged vein.

This article intends to present a case of a woman with trigeminal neuralgia in whom the presence of the primitive trigeminal artery (PTA) was disclosed during the investigation.

CASE-STUDY

A 72 year-old white woman was seen at the Hospital das Clínicas, Federal University of Pernambuco, with a complaint of bilateral trigeminal neuralgia in V2/V3 trigeminal territories since the age of 22. The pain appeared in both sides but independently, i.e. without synchronicity. A magnetic resonance imaging (MRI) study revealed the presence of a left-side primitive trigeminal artery and hypoplasia of the inferior portion of the basilar artery. The painful trigeminal neuralgia attacks were completely controlled with carbamazepine 200 mg twice a day.

COMMENTS

The blood supply to the hindbrain in the developing embryo occurs through a series of arteries that communicate the developing carotid arteries with the longitudinal neural arteries. A number of carotidobasilar and caroticovertebral anastomosis appear at different specific stages of the nervous system embryologic development.

Chronologically speaking, the trigeminal artery appears as early as when the embryo is 4-mm crown-

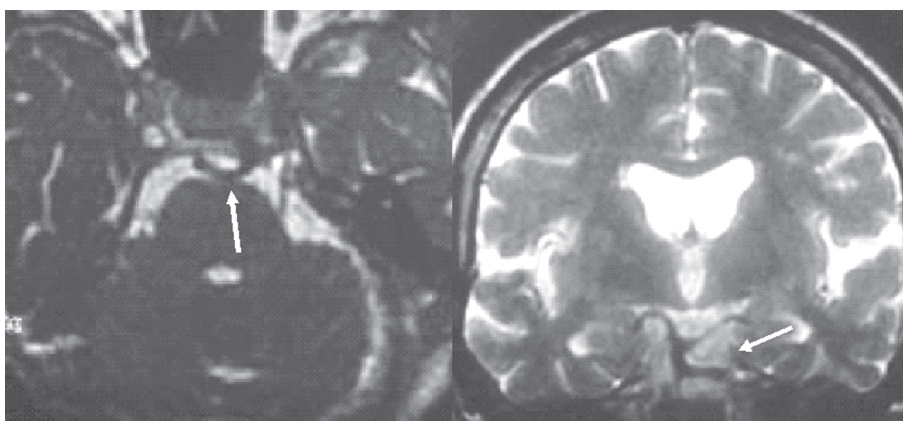


Figure: MRI showing the presence of a primitive trigeminal artery (arrows)

rump length stage, and regresses at the 7-12 mm stage. Soon after that, the hypoglossal and the proatlantal arteries (types I and II) arise from intersegmental longitudinal connections at the caudal end.

When the posterior communicating artery and the vertebrobasilar system are formed, the presegmental (trigeminal and hypoglossal) and the proatlantal intersegmental arteries regress.

From the anatomic-functional point of view, some of those above mentioned arteries may persist into adult life. After the posterior communicating artery in its fetal anatomic variant, the PTA is the vessel most frequently observed to persist after birth. In angiographic studies the incidence of PTA is estimated as 0.1-0.6%.

The anatomic origin of the PTA is located at the point where the internal carotid artery enters the cavernous sinus or just before it. In order to connect with the basilar artery, it continues through one of the two possible courses: (a) traveling extradurally between the trigeminal sensorial root and the lateral portion of the sella and then under the petroclinoid ligament to join the basilar artery between the superior and anterior inferior cerebellar arteries or (b) the PTA travels in a groove in the dorsum sellae and perforates the dura in close proximity to the clivus to reach the basilar artery. In some instances, it may persist incompletely and give rise solely to AICA, PICA or antero-superior cerebellar artery.^{4,5}

In conclusion, we are presenting the case of a woman with bilateral trigeminal neuralgia which atypically appeared early in her twenties in which MRI study showed the presence of the primitive trigeminal artery.

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