

Trigeminal Neuralgia Due To Persistent Trigeminal Artery

Clinical History: 51 year old male presented with history of localised intermittent pain in the left side of face since 2 to 3 years, with occasional pain in left ear. MRI brain and angiography was performed.

Imaging findings:

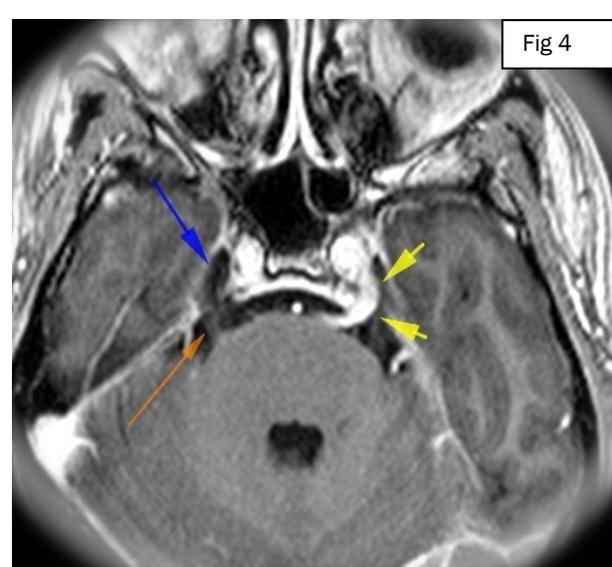
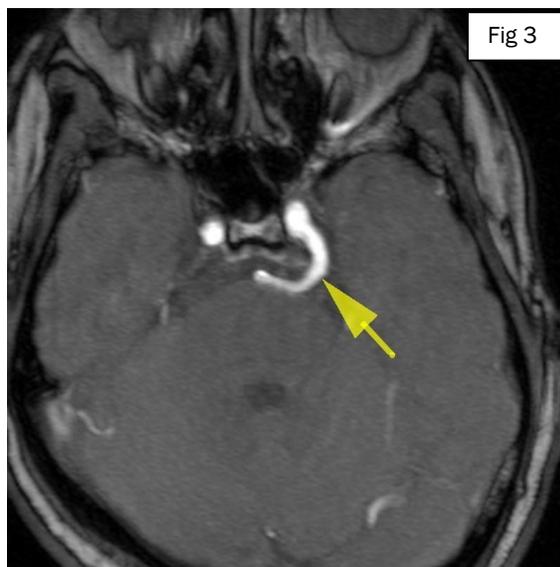
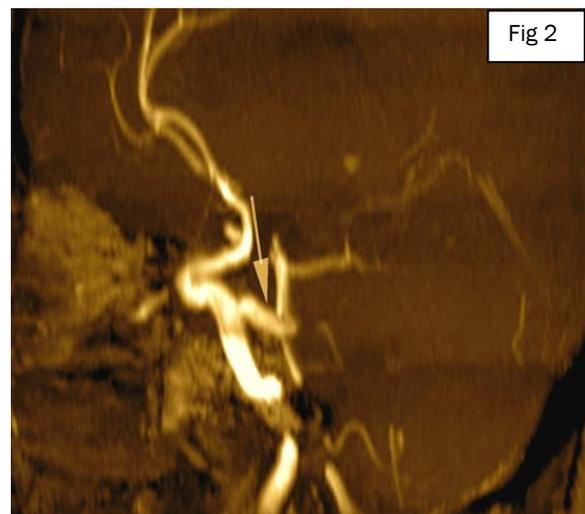
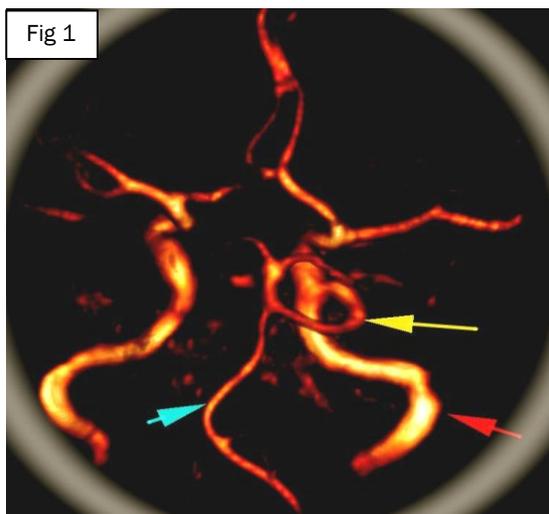


Fig 1 (3D-TOF MR angio) shows persistent trigeminal artery (yellow arrow), left internal carotid artery (red arrow) and basilar artery (blue arrow).

Fig 2 (sagittal MIP) shows 'Tau sign' PTA marked in yellow. It resembles greek letter 'tau' (letter τ),

Fig 4 (post contrast T1W axial) shows cisternal part and root entry zone (REZ) of the right trigeminal nerve (orange arrow) and right Meckel's cave (blue arrow). PTA is seen on left side (yellow arrows in Fig 3 and 4), indenting the left trigeminal nerve and encroaching on left Meckel's cave

Discussion:

Trigeminal artery is the artery supplying blood to the basilar artery during human embryonic development. Normally the trigeminal artery involutes after formation of posterior communicating artery. However in 0.1 to 0.6% individuals, it persists into adulthood as **persistent carotid basilar anastomosis** and termed as **persistent trigeminal artery (PTA)**.

This artery originates from the internal carotid artery immediately after its exit from the carotid canal and anastomoses with the midbasilar artery.

Two types of persistent trigeminal artery have been described—lateral and medial. In the lateral type, the artery courses posterolaterally with the trigeminal nerve. The medial type has an intrasellar course, coursing posteromedially from its origin, compressing the pituitary gland, and penetrating the dorsum sellae.

A persistent trigeminal artery also is classified according to the configuration of the ipsilateral posterior cerebral artery: In the presence of a **Saltzman type 1** persistent trigeminal artery, the posterior communicating artery is absent and the persistent trigeminal artery supplies the entire vertebrobasilar system distal to the site of anastomosis. In the presence of a **Saltzman type 2** persistent trigeminal artery there is a fetal posterior cerebral artery, and the ipsilateral P1 segment is absent.

Tau sign is seen on sagittal MR angiography sequences. The combination of the vertical and horizontal segments of the ICA and the proximal portion of the trigeminal artery creates the outline of the Greek letter τ (Tau).

Associated anomalies include intracranial aneurysms, which are seen in approximately 14% of patients with a persistent trigeminal artery. Knowledge of the presence of a persistent trigeminal artery in a medial or intrasellar location in a patient who is to undergo trans-sphenoidal surgery for pituitary adenoma is clinically important because accidental transection of the artery may result in a life-threatening hemorrhage.

Symptoms may be produced due to compression of the adjacent structures by the artery. Persistent trigeminal artery is a rare cause of trigeminal neuralgia.

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N.B: This case is authentic and from the archives of Radiance Diagnostics. For any queries/suggestions/feedback write to us at radiance@radiancediagnostics.in. Case of the month can also be accessed anytime online at **VIEW BOX** at www.radiancediagnostics.in