Vascular Variants of the Sellar Region 59

Françoise Cattin

59.1 Persistent Trigeminal Artery

The persistent trigeminal artery is the most common persistent fetal carotid-basilar anastomosis (0.1–0.2 %).

In the lateral type, the trigeminal artery arises from the lateral aspect of the intracavernous internal carotid artery, and runs caudally, passing round the bottom of the dorsum sellae to join the basilar artery (Fig. 59.1). In this case, the persistent trigeminal artery is easily identified and does not perturb the analysis of the sellar content.

In the medial type the trigeminal artery arises from the medial aspect of the internal carotid artery, runs caudally through the sella turcica, and pierces the dorsum sellae to join the basilar artery (Fig. 59.2). In this case, the unusual intrasellar vessel can be the source of traps. On coronal T1 and T2 WIs, it appears as a lateralized round hypointense structure in contact with the sellar floor. Sagittal and axial MR images and axial CT demonstrate the channel piercing the dorsum sellae. 3D time-of-flight (TOF) MRA helps to confirm the

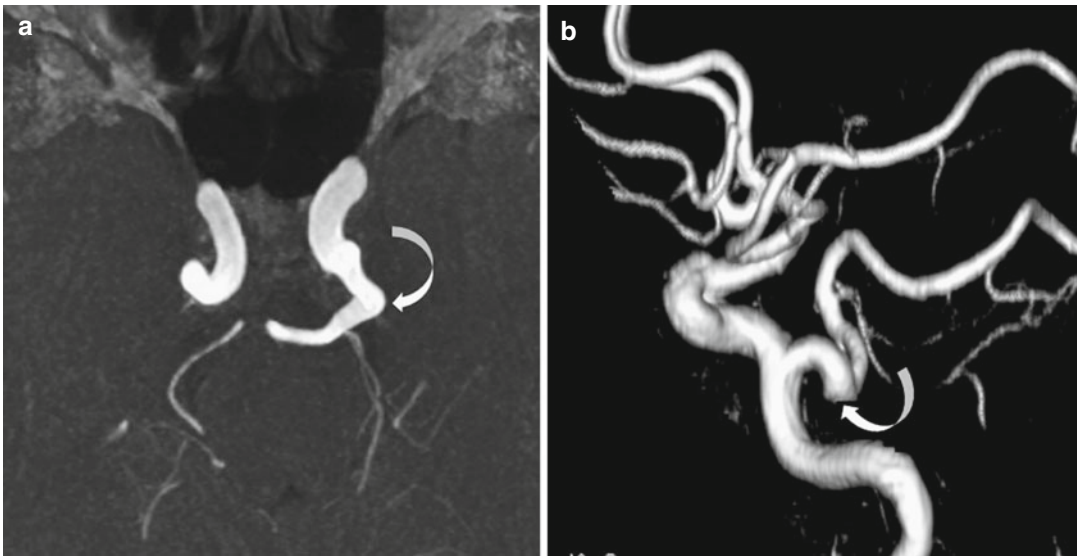

Fig. 59.1 MRA 3D TOF. (**a**) Axial maximal-intensity projection (MIP) reconstruction and (**b**) Volume-rendered sagittal view demonstrating a lateral persistent trigeminal artery (*curved arrow*) passing around the dorsum sellae to join the basilar artery

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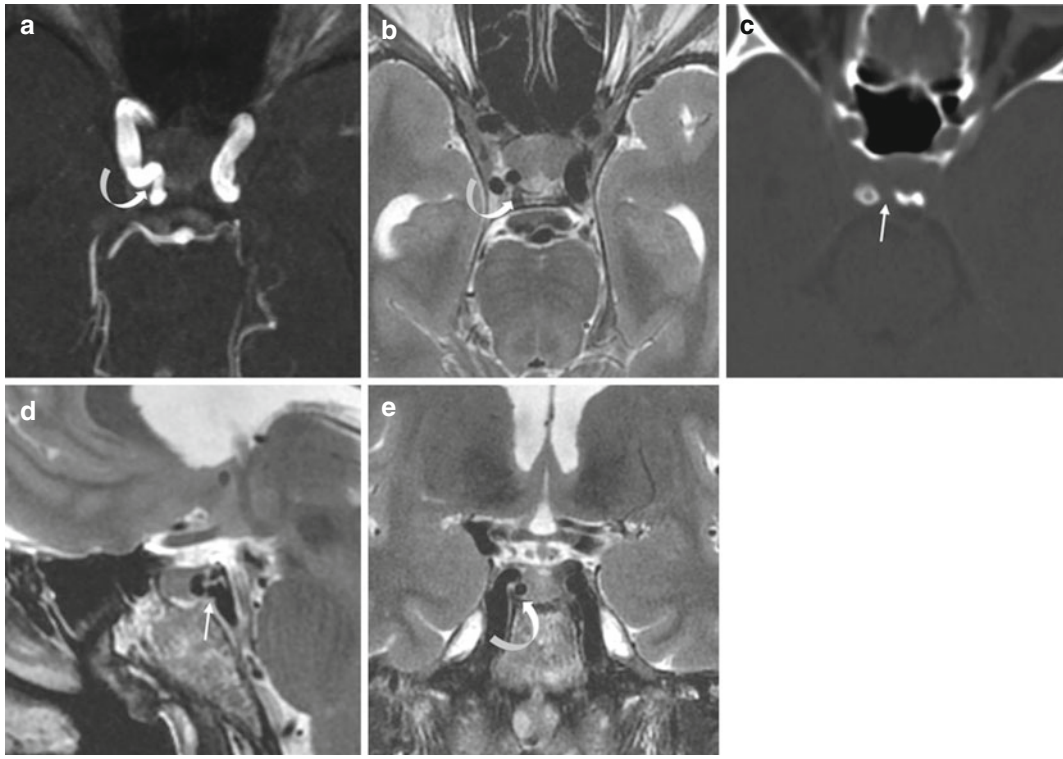

Fig. 59.2 Medial type of persistent trigeminal artery. (**a**) Axial MIP reconstruction of 3D TOF MR angiography. The persistent trigeminal artery (*curved arrow*) arises from the medial aspect of the intracavernous internal carotid artery. (**b**) Axial T2WI showing the posterior direction of the abnormal artery (*curved arrow*). (**c**) CT axial image, bone window and (**d**) sagittal T2WI showing the channel in the dorsum sellae (*arrow*). (**e**) Coronal T2WI. The trigeminal artery appears as an intrasellar round image close to the sellar floor, in contact with the pituitary gland (*curved arrow*)

diagnosis. Association of persistent trigeminal artery and pituitary adenoma has been reported. In this case, recognition of an intrasellar persistent trigeminal artery is crucial if transsphenoidal surgery is scheduled.

59.2 Intrasphenoidal Internal Carotid Artery

Transsellar intercavernous anastomosis is a rare congenital vascular anomaly, seen in the case of unilateral internal carotid artery agenesis. In the case of internal carotid artery agenesis, arterial insufficiency is usually compensated by the contralateral internal carotid artery and the vertebrobasilar system via the circle of Willis. Infrequently, the cerebral hemisphere with internal carotid artery agenesis is supplied by a transsellar intercavernous vessel connecting both internal carotid arteries. Transsellar intercavernous anastomosis is recognized on all MR sequences as a large, high-flow vessel with flow void running into the sella.

59.3 Inferior Intercavernous Sinus

The cavernous sinuses are interconnected by four venous structures: the anterior intercavernous sinus, the posterior intercavernous sinus, the inferior intercavernous sinus, and the basilar plexus. The inferior intercavernous sinus can be plexus-like, venous lake, or mixed. In its venous lake form, it is demonstrated on coronal images as a band doubling the sellar floor, usu-

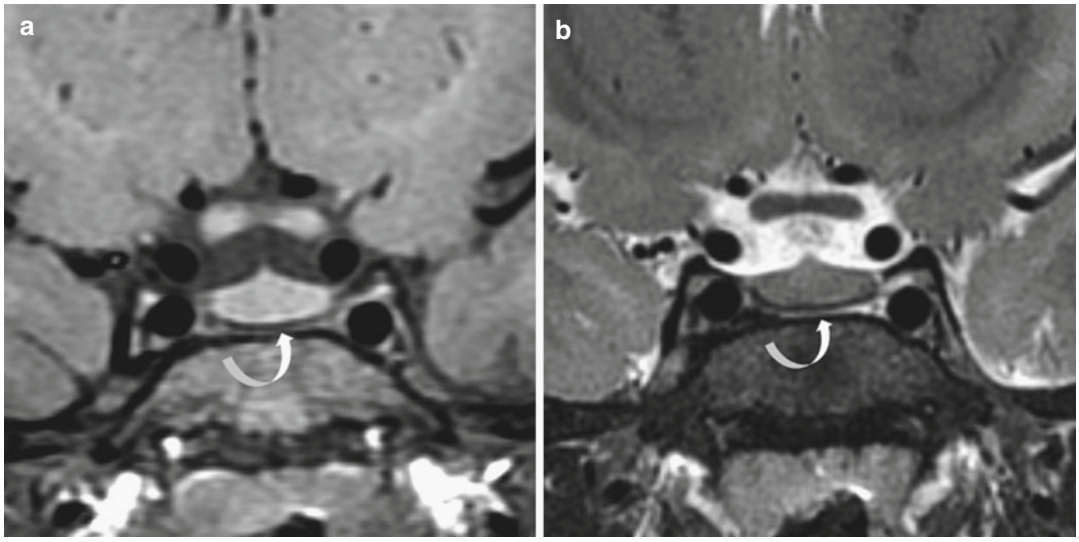

Fig. 59.3 (**a**, **b**) Coronal T1 and T2 WIs. Normal inferior intercavernous sinus in a 5-year-old boy. Its appears as a band doubling the sellar floor, hypointense on T1WI and hyperintense on T2WI (*curved arrow*)

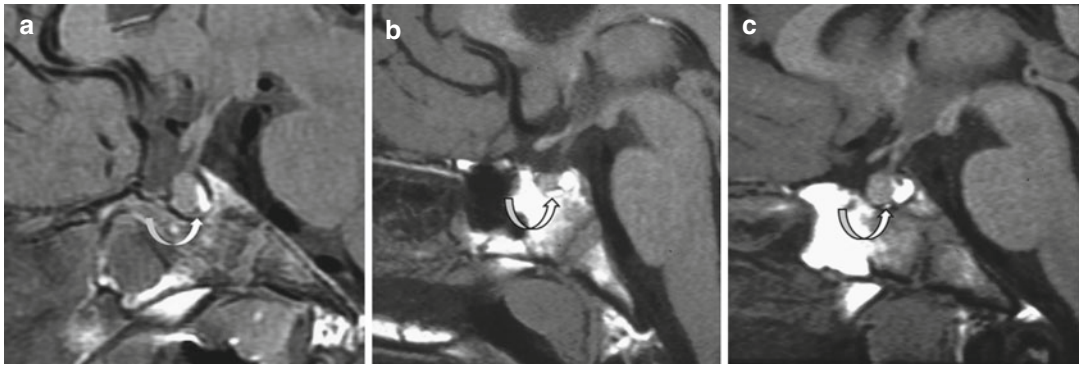

Fig. 59.4 (**a**–**c**) Sagittal T1WIs depicting inferior cavernous sinus in three children (*arrows*)

ally hypointense on T1WI and hyperintense on T2WI (Fig. 59.3). On sagittal images it appears as a small round image in contact with the sellar floor (Fig. 59.4). It is observed in about one in three normal children. In adults, its visualization is less common; demonstration of a large inferior intercavernous sinus can be observed in intracranial hypotension syndrome, cavernous sinus meningioma, and arteriovenous fistula of the sellar region. Anterior and posterior intercavernous sinuses are infrequently seen on MRI.

59.4 Intrasellar Internal Carotid Artery

Dolichoectatic internal carotid arteries are encountered in the elderly, in patients with atheromatous disease, in patients with chronic arterial hypertension, in acromegaly, and in various arterial wall diseases. Dolichoectatic siphons can penetrate into the sella turcica and reduce the space for the pituitary gland.

Medially located internal carotid arteries may reduce the sellar volume and lead to a convex

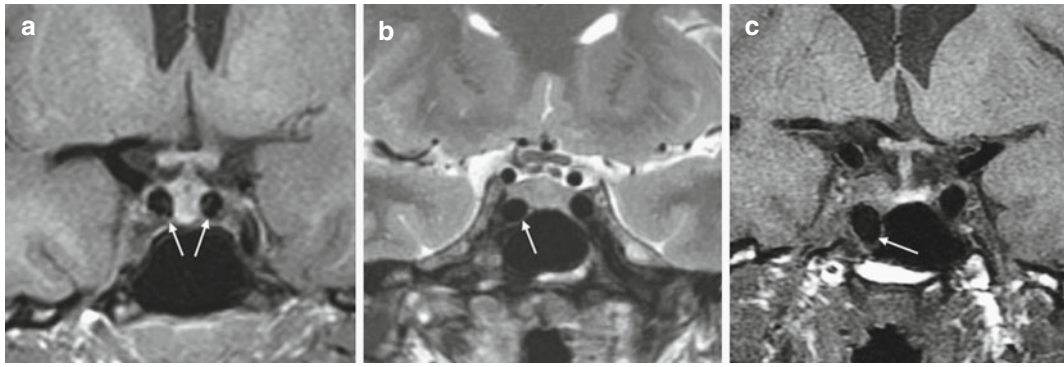

Fig. 59.5 (**a**) Coronal T1WI. Medially located intracavernous internal carotid arteries (*arrows*) decrease the sellar volume. The pituitary gland is cramped into the sella turcica. (**b**) Coronal T2WI. Unilateral medially located internal carotid artery (*arrow*). (**c**) Coronal T1WI. Prolapse of the right internal carotid artery in the sphenoid sinus (*arrow*)

pituitary gland (Fig. 59.5). Prolapse of the internal carotid artery into the sphenoid sinus may be the source of hemorrhagic complications during transsphenoidal surgery.

Further Reading

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