



MEETING

SCUOLA DI SPECIALIZZAZIONE IN
RADIODIAGNOSTICA



VARIANTI ANATOMICHE ARTERIOSE CEREBRALI

- Varianti di calibro
- Varianti di origine
- Varianti di decorso

VARIANTI DI DECORSO

- **Tortuosità:** allungamento od ondulazione del vaso a forma di S
- **Coiling:** allungamento che determina una configurazione circolare del vaso
- **Kinking:** angolazione di uno più segmenti del vaso associato spesso a stenosi

Type 1
Tortuosity



Type 2
Coil



Type 3
Kinking





Strage di Erba: parla Mario Frigerio, unico sopravvissuto

Erba, parla il sopravvissuto:

«Non ho dubbi, era lui, mi guardava con occhi da assassino. L'ho visto mentre mi tagliava la gola»

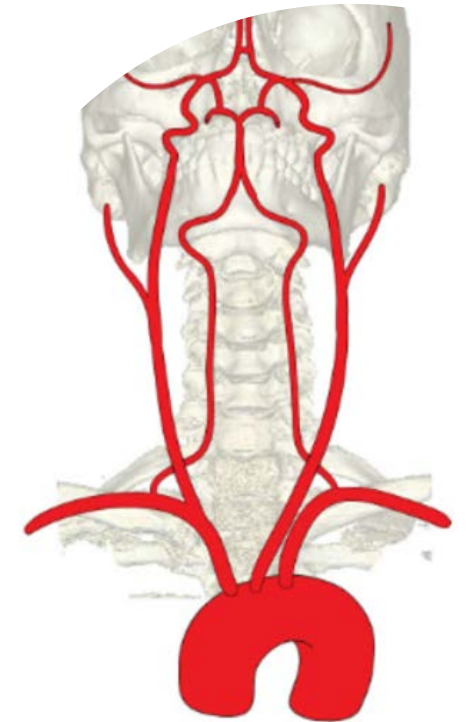
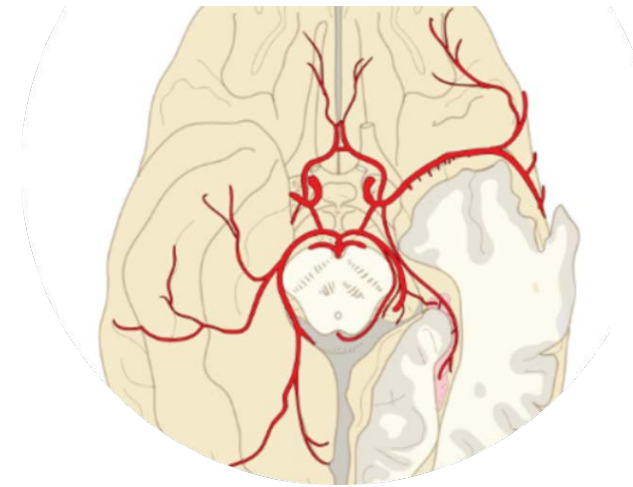
Strage di Erba, il massacro che sconvolse l'Italia

La scena del delitto, le indagini, la confessione e il processo che ha condannato Olindo e Rosa. La ricostruzione di una delle notti più nere della cronaca italiana



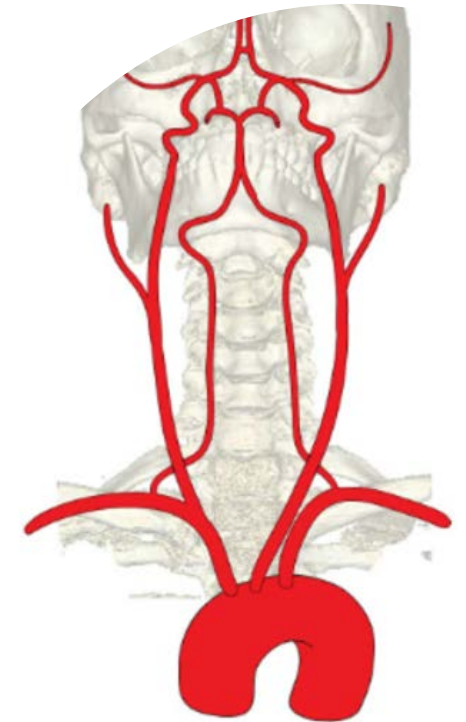
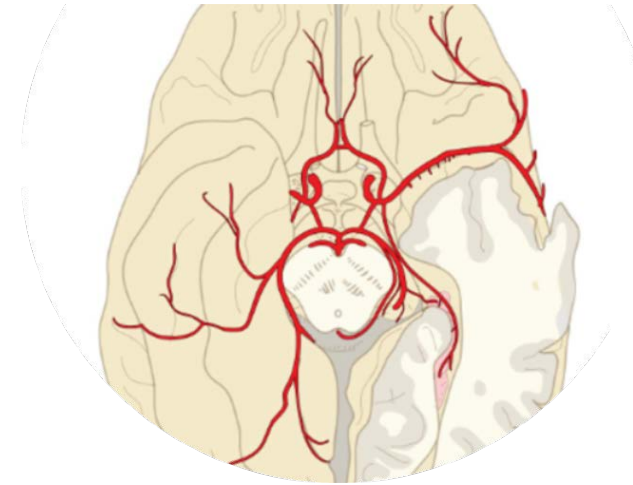
VARIANTI ANATOMICHE ARTERIOSE CEREBRALI

- ARCO AORTICO ED ORIGINE VASI EPIAORTICI
- ARTERIA CAROTIDE INTERNA
- CIRCOLO DI WILLIS
- ARTERIA CEREBRALE ANTERIORE
- ARTERIA CEREBRALE MEDIA
- ARTERIA CEREBRALE POSTERIORE
- SISTEMA VERTEBRO-BASILARE



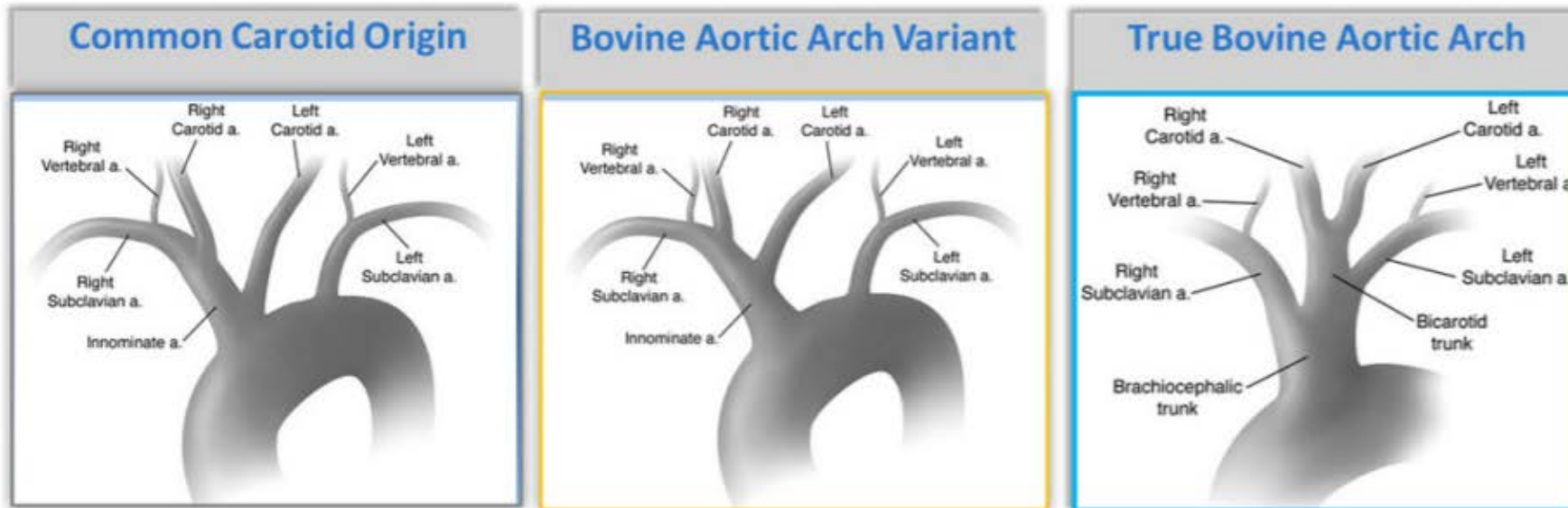
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ARCO AORTICO ED ORIGINE VASI EPIAORTICI

Arco aortico bovino (10-20%)



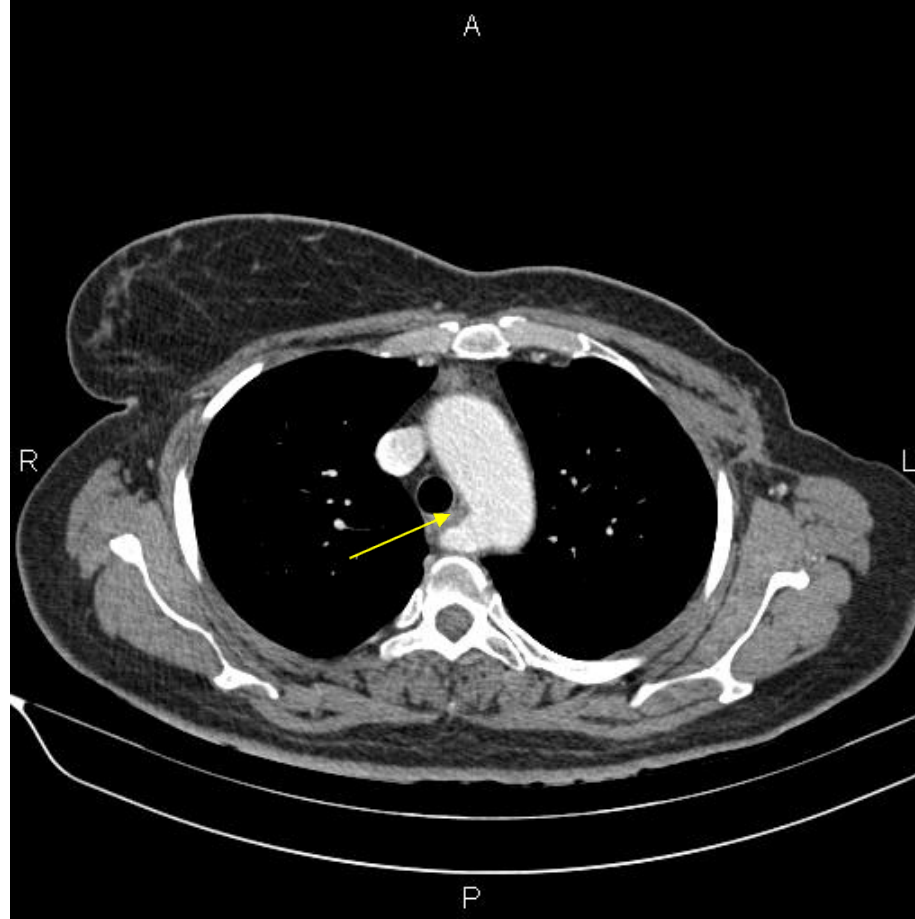
ARCO AORTICO ED ORIGINE VASI EPIAORTICI

ARTERIA LUSORIA

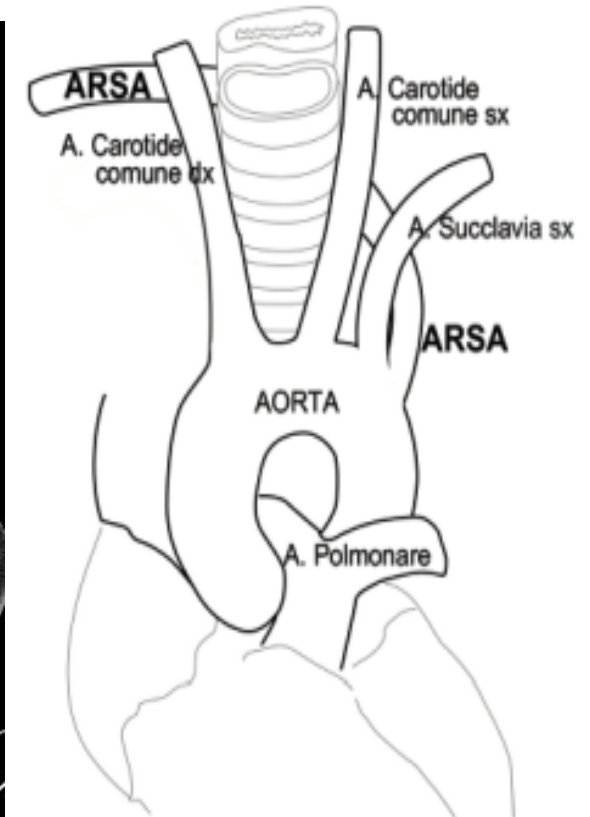
La più comune anomalia congenita dell'arco aortico (**0.5-2%**)

Origine della succlavia di destra a livello della porzione più distale dell'arco aortico, dopo l'origine della succlavia di sinistra

Clinica: nella maggior parte asintomatica, in alcuni casi può causare **disfagia lusoria**

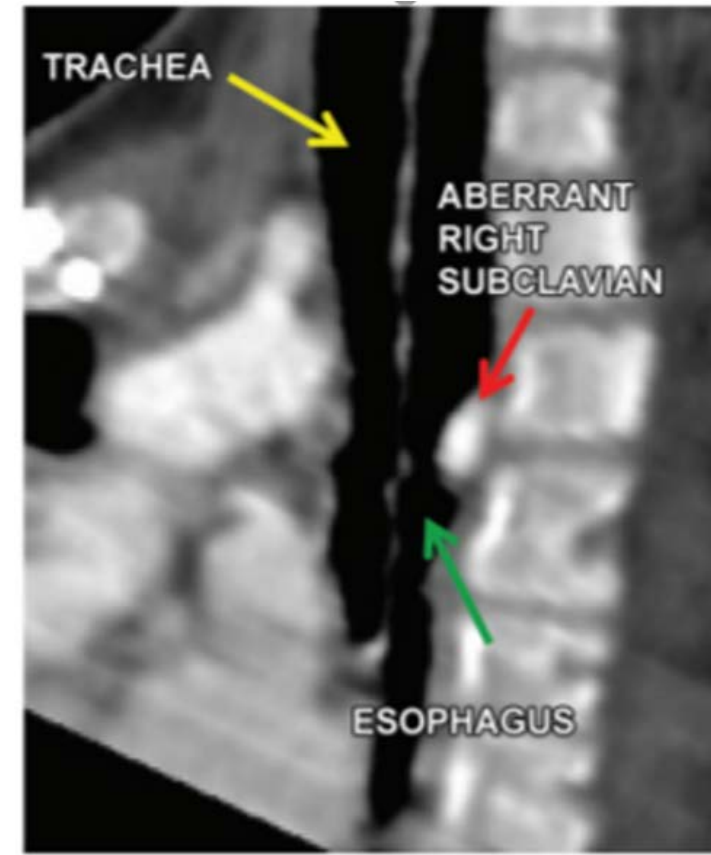
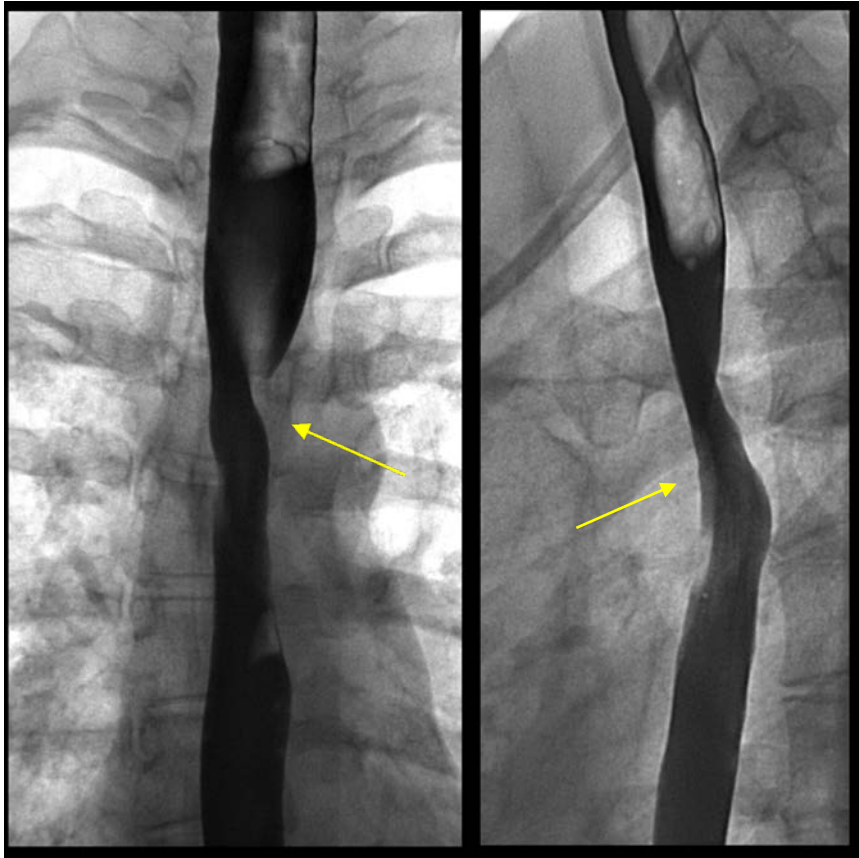


Radiopaedia.org



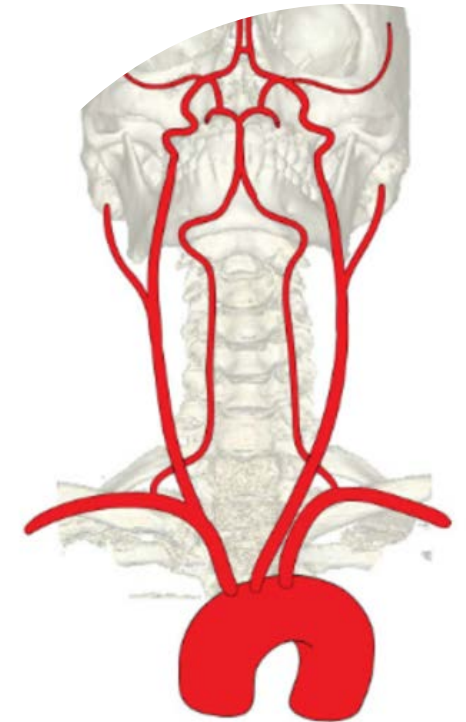
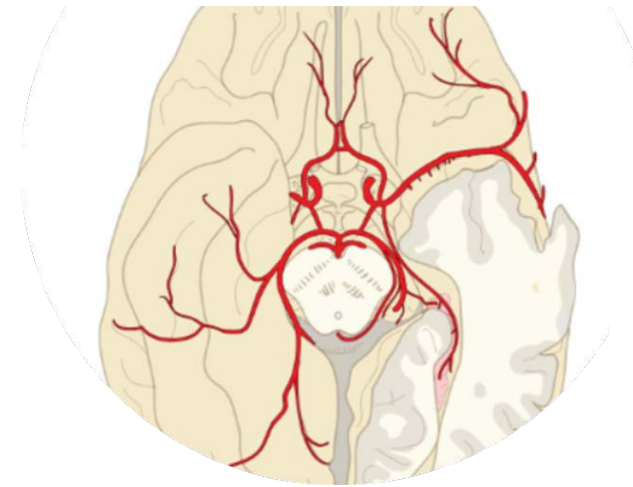
ARCO AORTICO ED ORIGINE VASI EPIAORTICI

DISFAGIA LUSORIA



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ARTERIA CAROTIDE INTERNA: PRINCIPALI VARIANTI ANATOMICHE

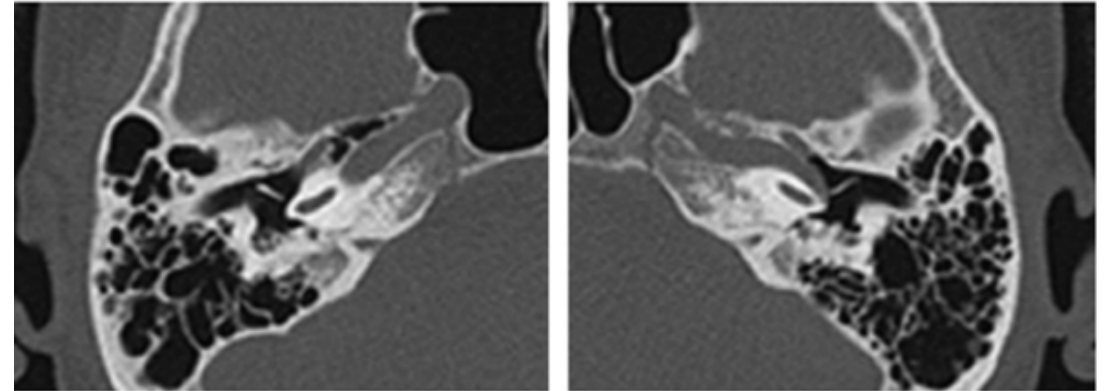
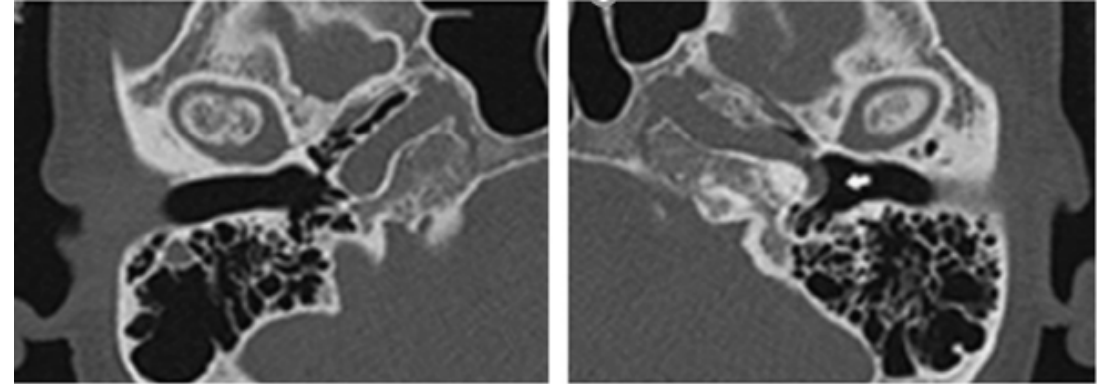
Aberrant internal carotid artery as a cause of
objective pulsatile tinnitus

Kazuhira Endo ^{a,*}, Yumiko Maruyama ^b, Toshiaki Tsukatani ^c,
Mitsuru Furukawa ^c

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^b Department of Otolaryngology, Kurobe City Hospital, Japan

^c Division of Otolaryngology, Graduate School of Medicine, Kanazawa University, Japan

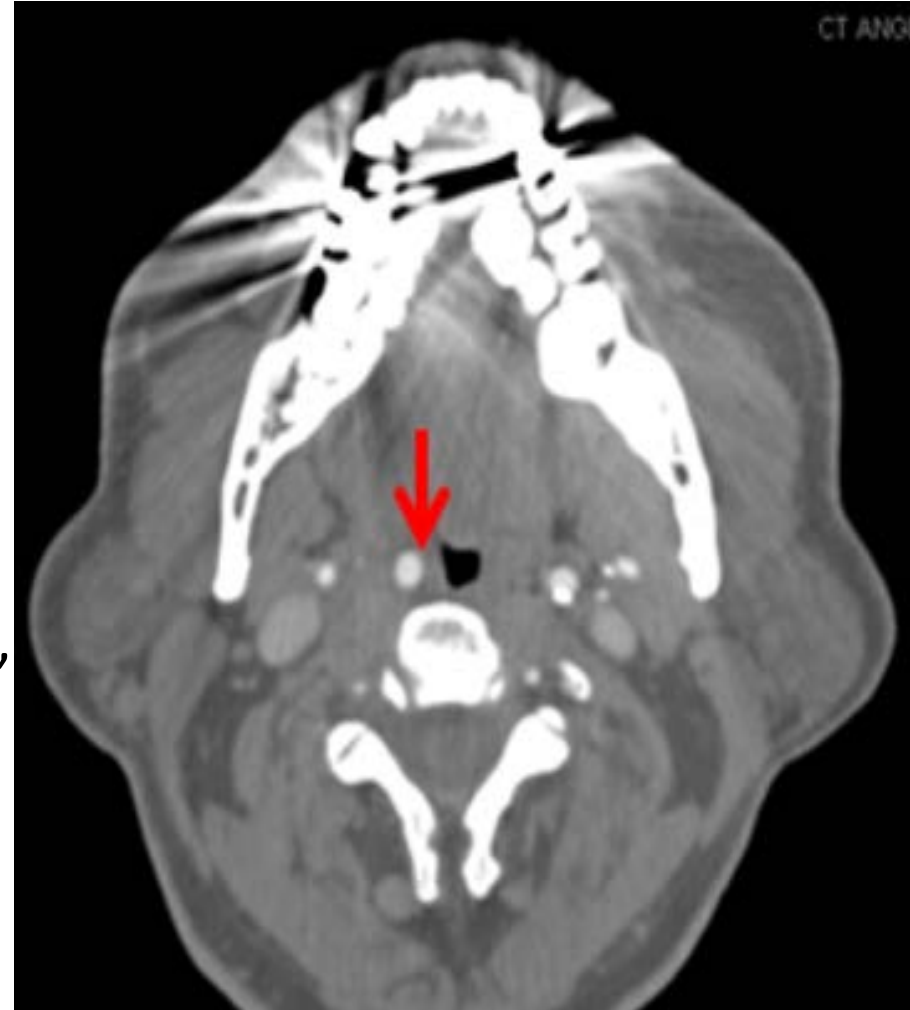


ARTERIA CAROTIDE INTERNA: PRINCIPALI VARIANTI ANATOMICHE

Retrofaringea (10%)

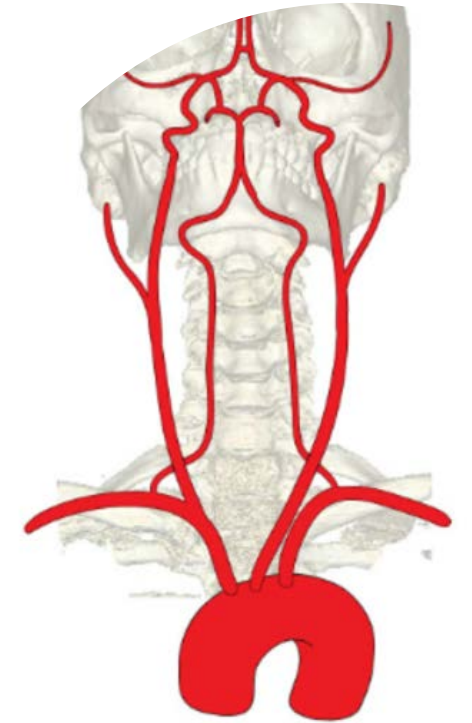
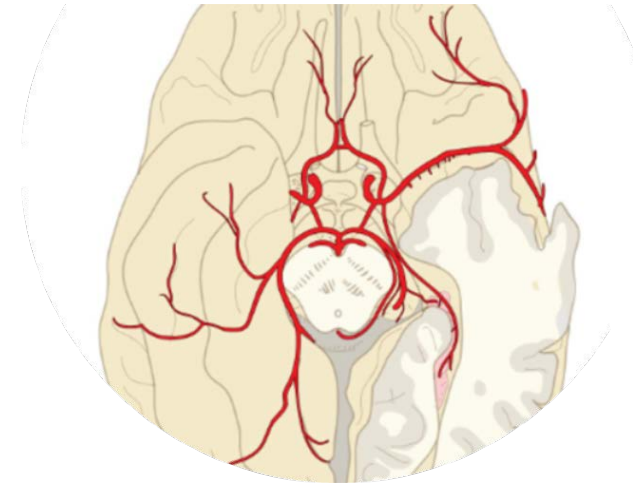
anomalo decorso dell'ACI
posteriormente alla parete
dell'orofaringe.

Se bilaterale "kissing carotids"



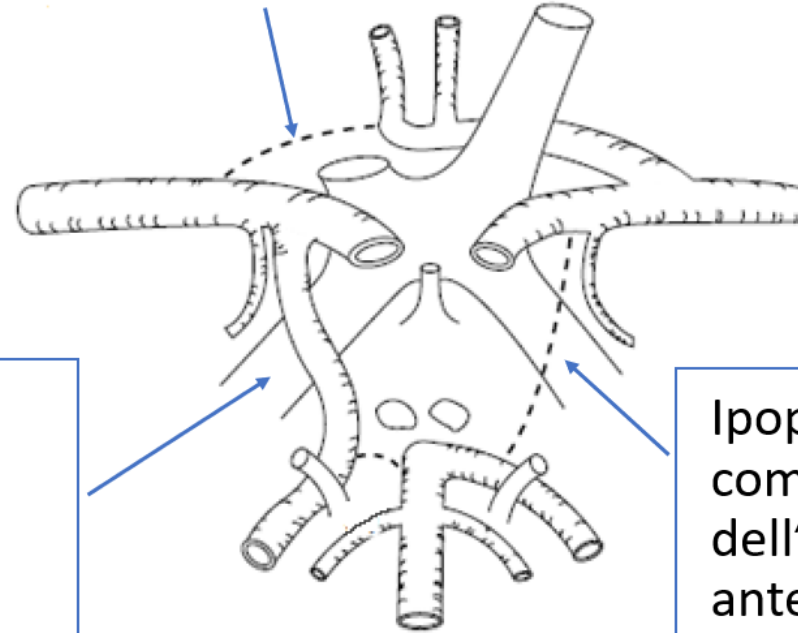
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CIRCOLO DI WILLIS: VARIANTI ANATOMICHE

Assenza/ipoplasia unilaterale del tratto A1



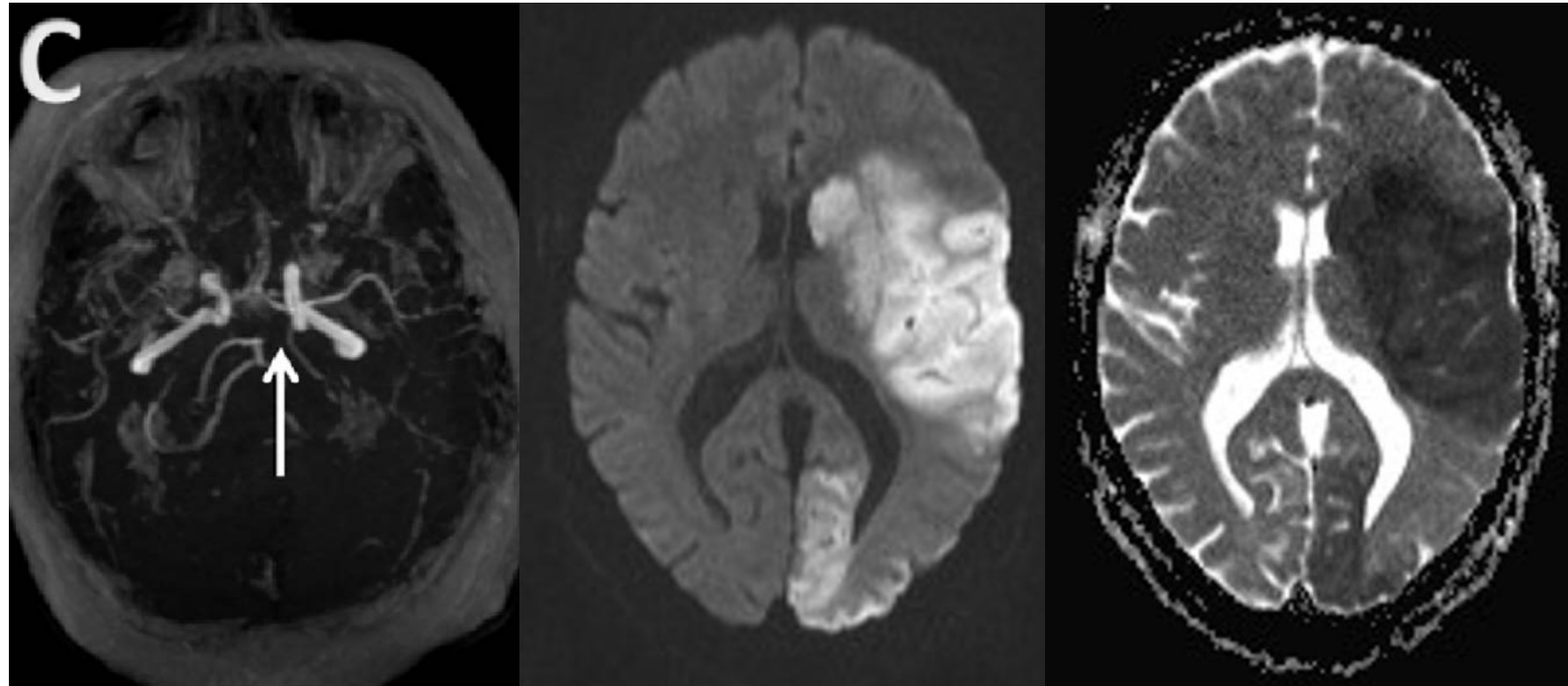
Origine fetale dell'arteria
cerebrale posteriore

Ipoplasia delle arterie
comunicanti posteriori,
dell'arteria comunicante
anteriore, dei segmenti A1,
P1 (molto frequente).

CIRCOLO DI WILLIS: VARIANTI ANATOMICHE

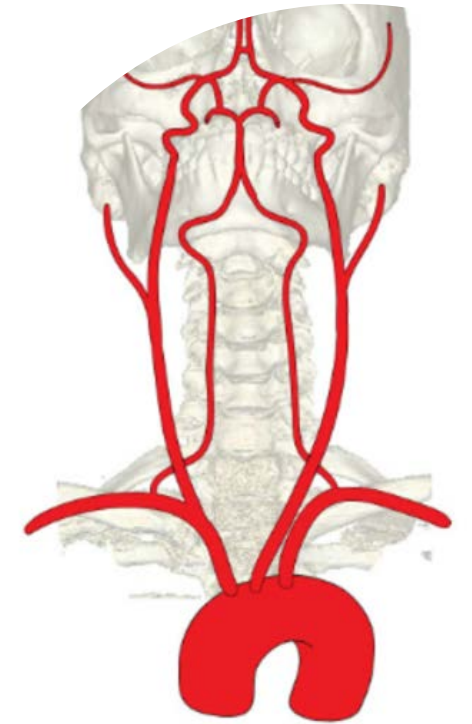
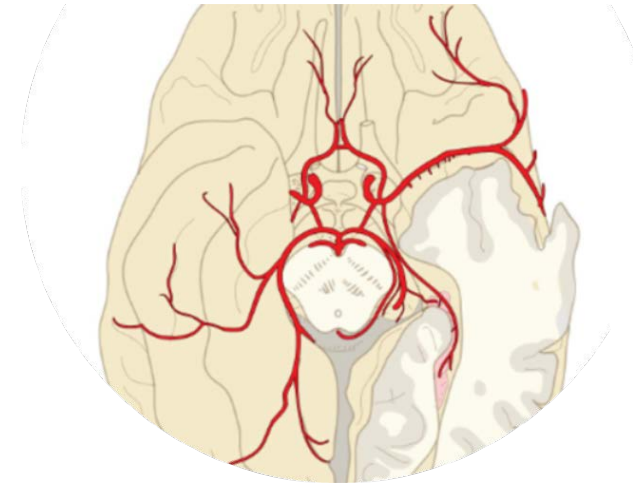
**Internal carotid occlusion - MCA &
PCA infarcts due to PCA fetal origin**

**Origine fetale dell'ACP
(20-30%)**



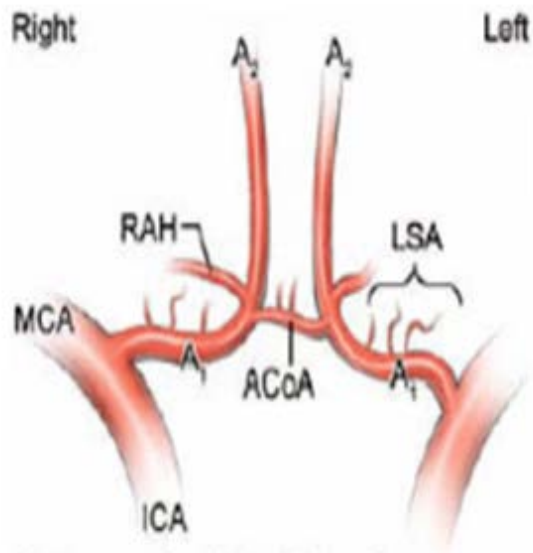
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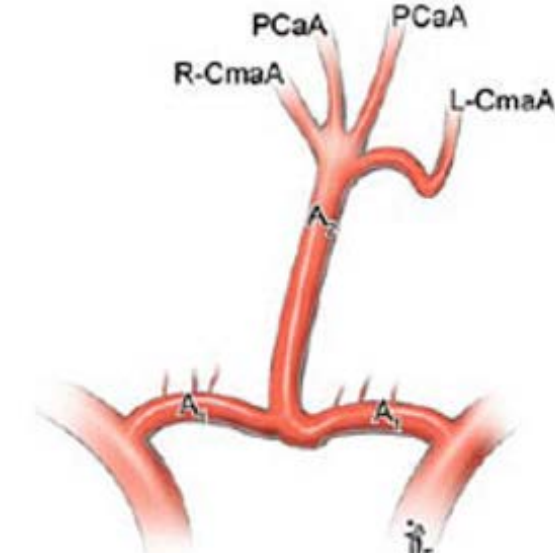


ARTERIA CEREBRALE ANTERIORE: PRINCIPALI VARIANTI ANATOMICHE

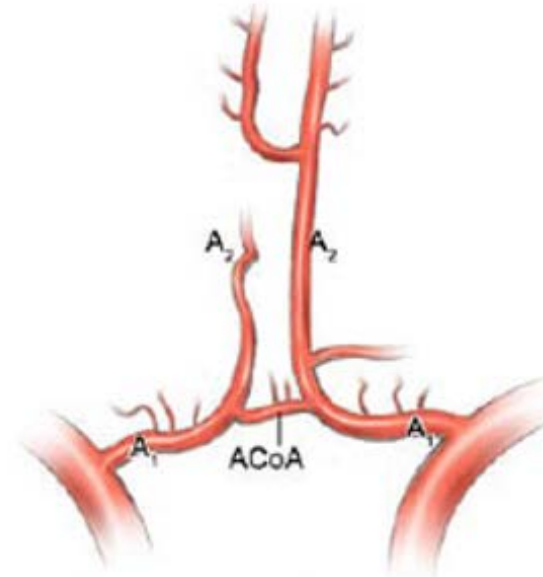
ACA Azygos (2%): segmenti A2 fusi, per definizione l'arteria comunicante anteriore è assente. Da non confondere con l' a. cerebrale anteriore **biemisferica** in cui i tratti A2 sono asimmetrici e quello iperplastico irrorava entrambi gli emisferici (molto comune).



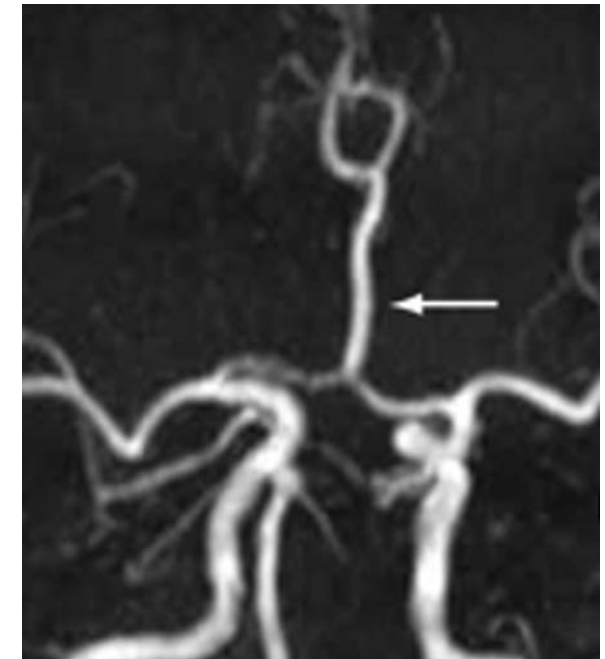
A. Symmetrical ACoA Complex





F. Azygos ACA



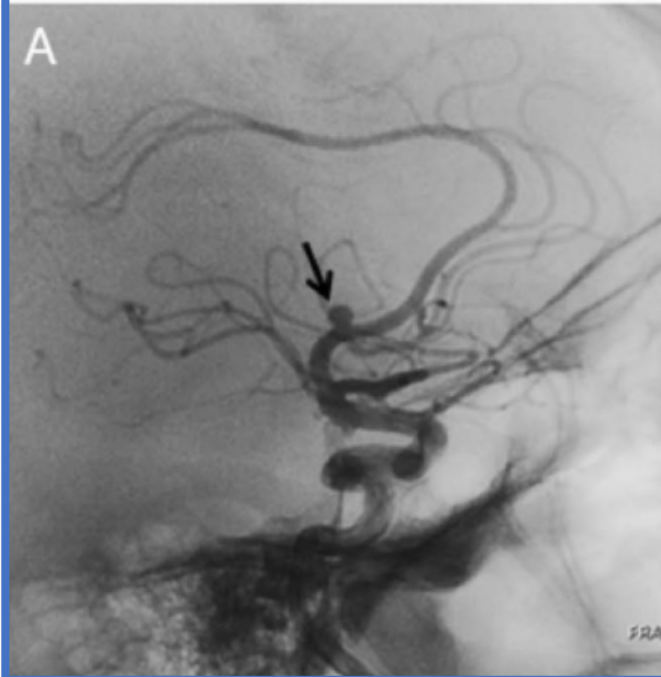
G. Bihemispheric ACA



Radiological classification of azygos anterior cerebral artery and evaluation of the accompanying vascular anomalies

Murat Beyhan¹  · Erkan Gökçe¹  · Kayhan Karakuş² 

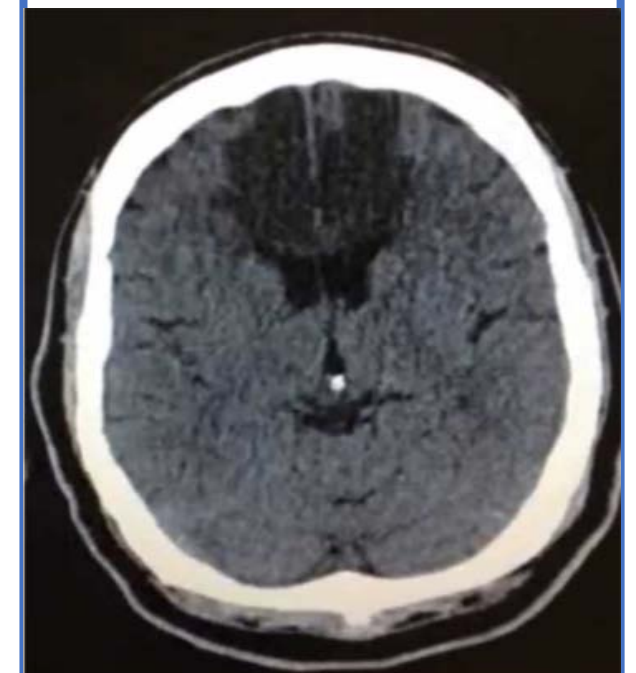
Aneurismi (13-71%)



Agnesia del corpo calloso

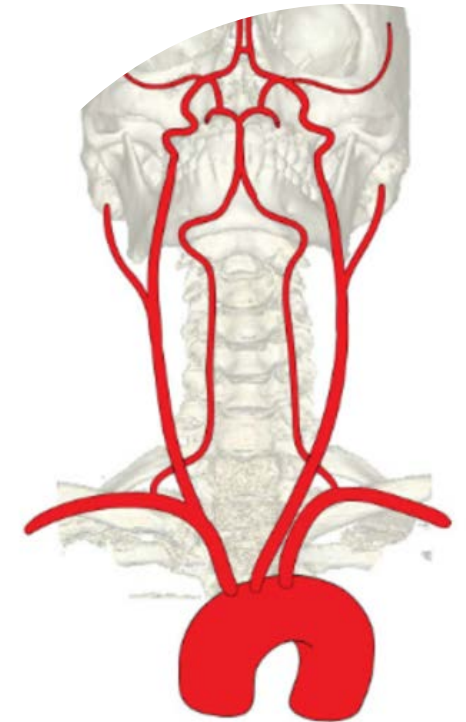
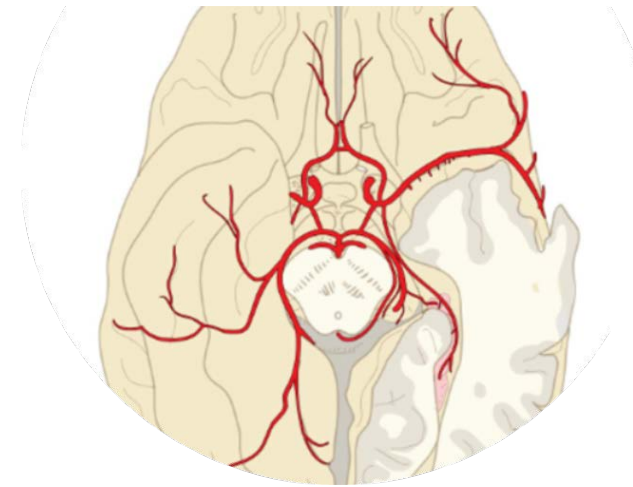


Infarto Bifrontale



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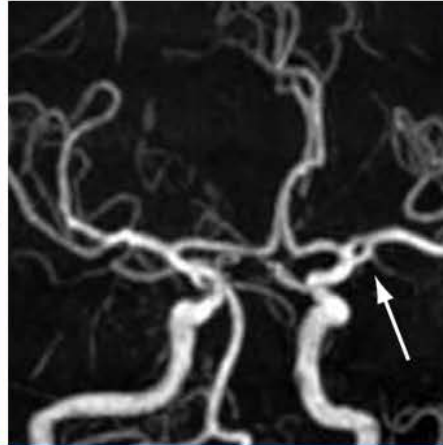
ARTERIA CEREBRALE MEDIA: PRINCIPALI VARIANTI ANATOMICHE

Duplicazione ACM (2%)



ACM accessoria

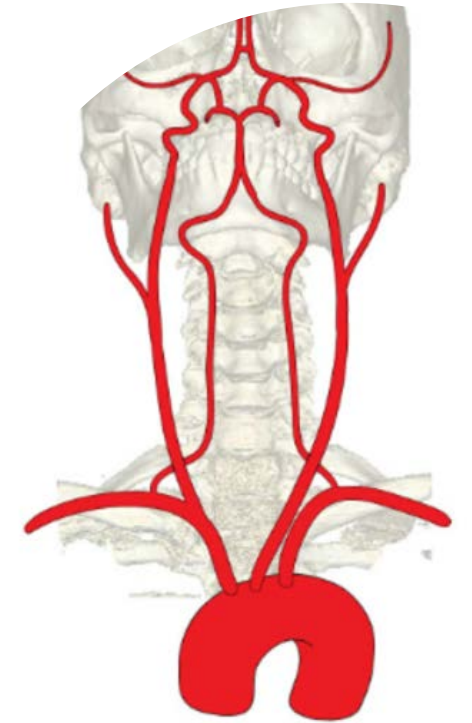
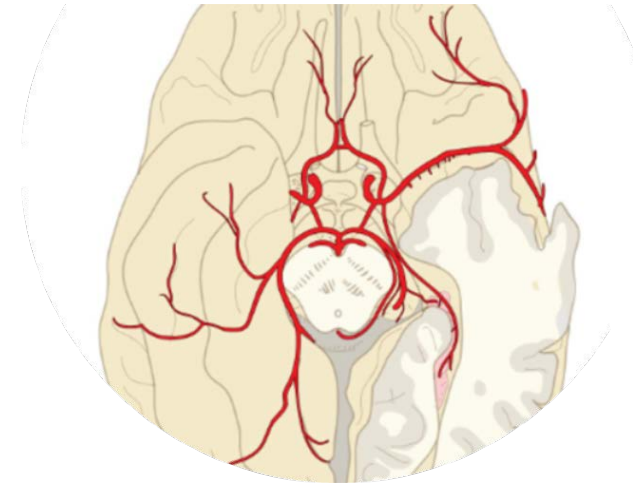
Biforcazione precoce dell'ACM



Fenestrazione (rara)

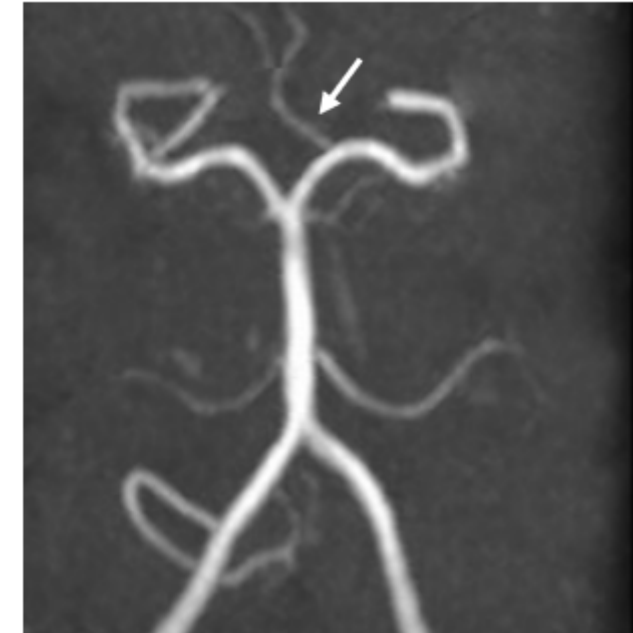
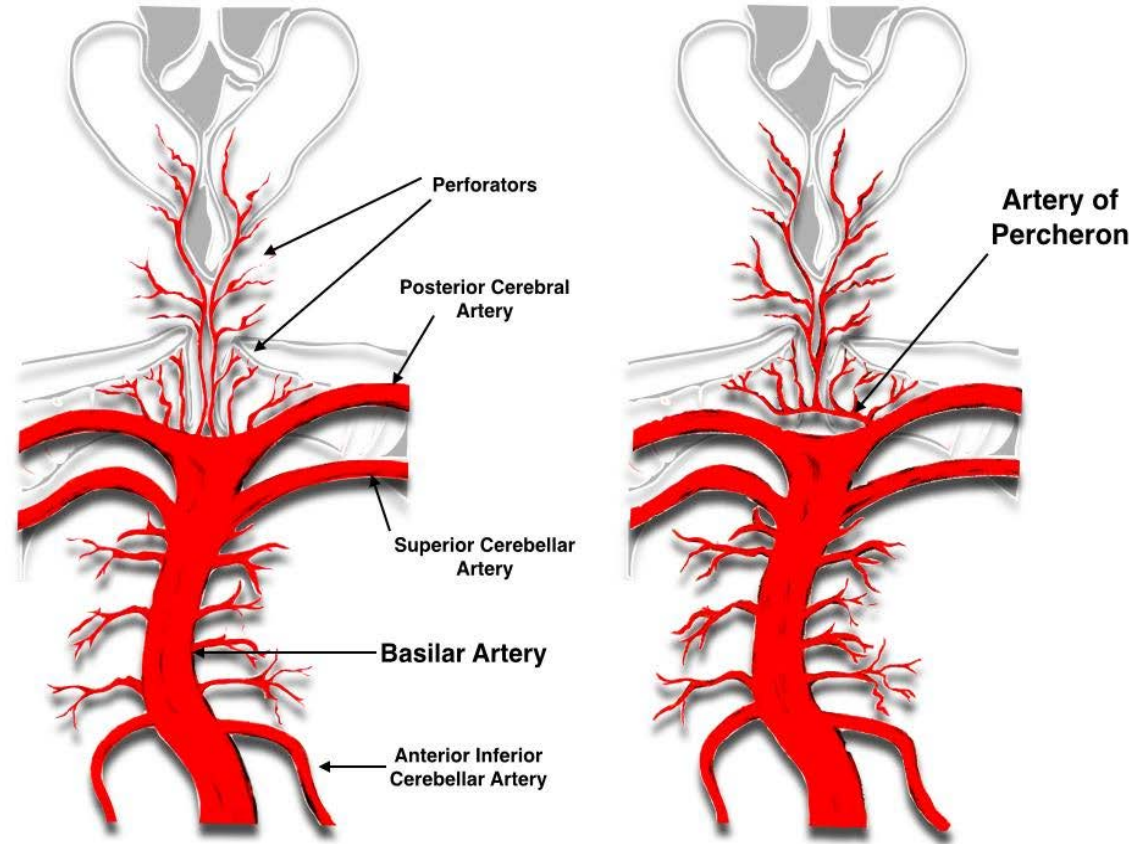
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ARTERIA CEREBRALE POSTERIORE: PRINCIPALI VARIANTI ANATOMICHE

Arteria di Percheron (4-12%): è un tronco arterioso solitario che nasce dal segmento prossimale di una delle due arterie cerebrali posteriori e rifornisce la porzione mediale di entrambi i talami.



Occlusione acuta dell'Arteria di Percheron → Infarto Bitalamico



Sintomatologia: riduzione dello stato di coscienza, deterioramento cognitivo e disturbi oculomotori.



Imaging CTA e MRA solitamente negativi.



In situazioni di emergenza in cui la severità del quadro clinico non correla con l'imaging considerare l'infarto da Arteria di Percheron come possibile diagnosi differenziale.

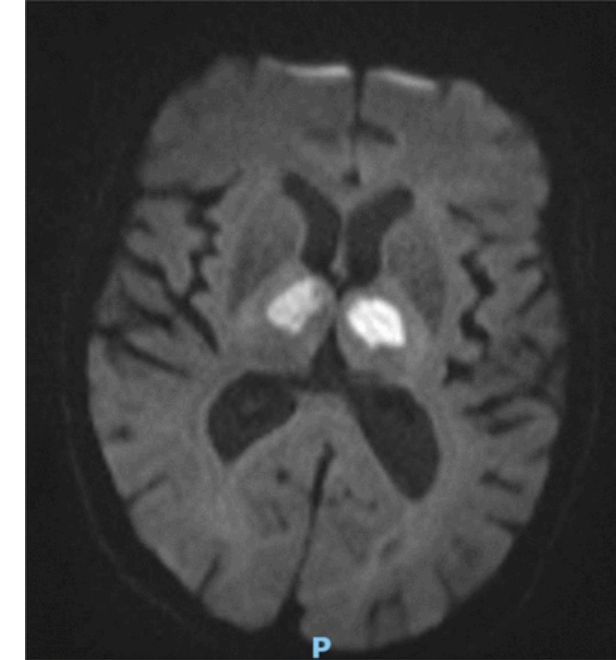
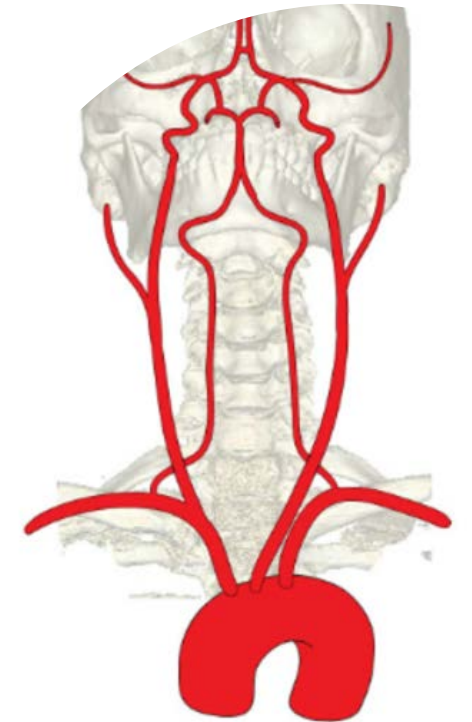
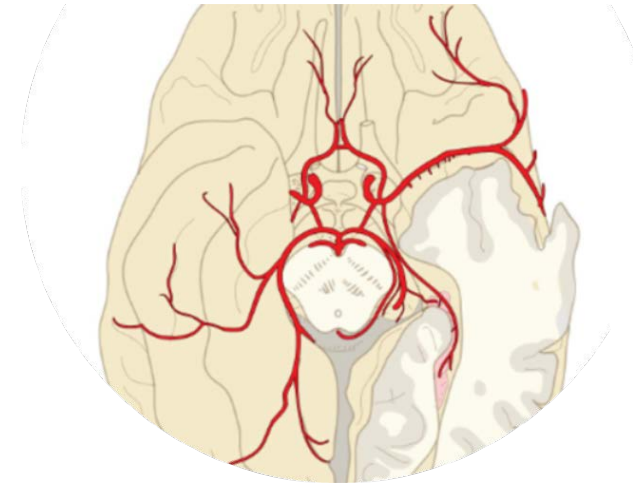


Table 1-1 Cause of Stupor or Coma in 500 Patients Initially Diagnosed as "Coma of Unknown Etiology"^{1,2*}

	Subtotals		Subtotals
I. Supratentorial lesions	101	B. Destructive or ischemic lesions	53
A. Rhinencephalic and subcortical destructive lesions	2	1. Pontine hemorrhage	11
1. Thalamic infarcts	2	2. Brainstem infarct	40
B. Supratentorial mass lesions	99	3. Basilar migraine	1
1. Hemorrhage	76	4. Brainstem demyelination	1
a. Intracerebral	44	III. Diffuse and/or metabolic brain dysfunction	326
(1) Hypertensive	36	A. Diffuse intrinsic disorders of brain	38
(2) Vascular anomaly	5	1. "Encephalitis" or	14

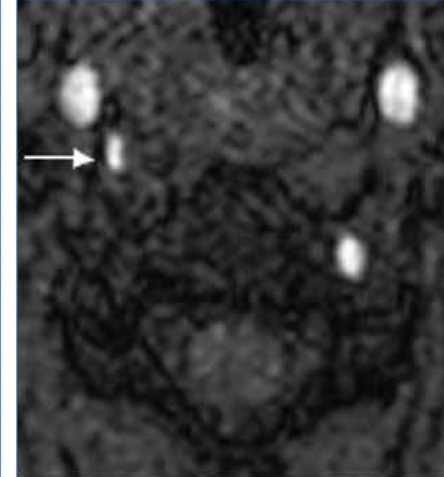
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- **SISTEMA VERTEBRO-BASILARE**



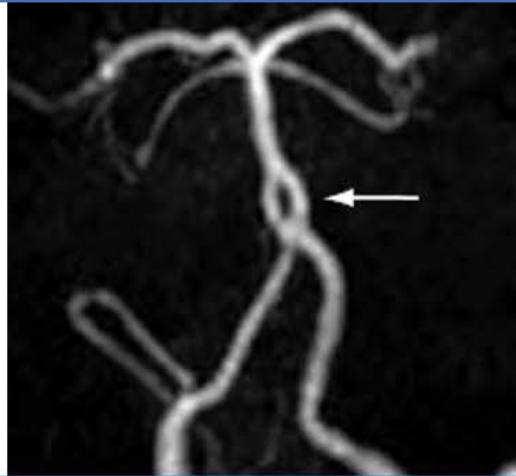
SISTEMA VERTEBRO-BASILARE: PRINCIPALI VARIANTI ANATOMICHE

Origine dell' a. vertebrale di sinistra dall'arco aortico (5%)



Decorso anteriore dell'arteria vertebrale (10%)

Fenestrazione dell'arteria basilare (2%)

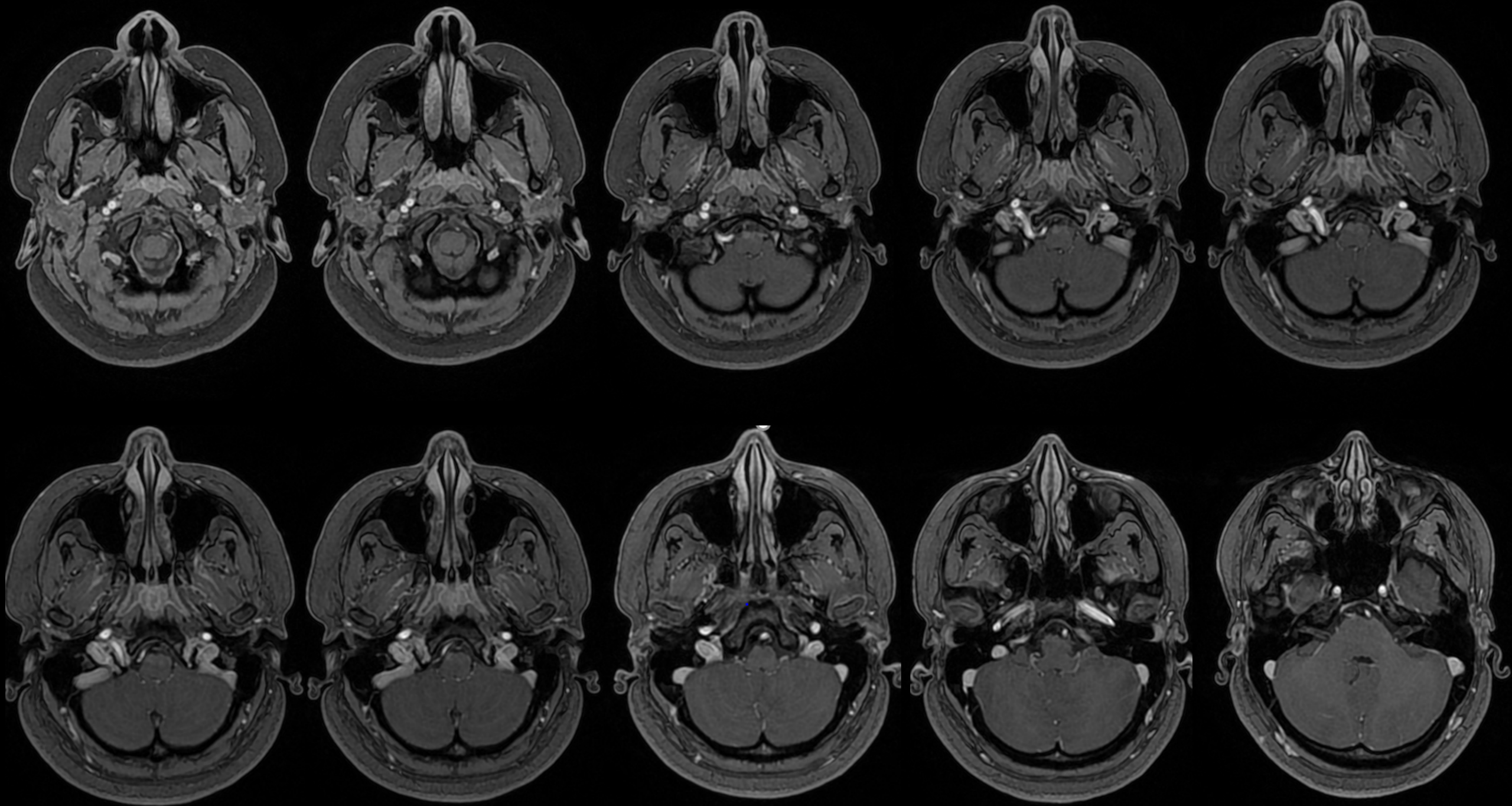


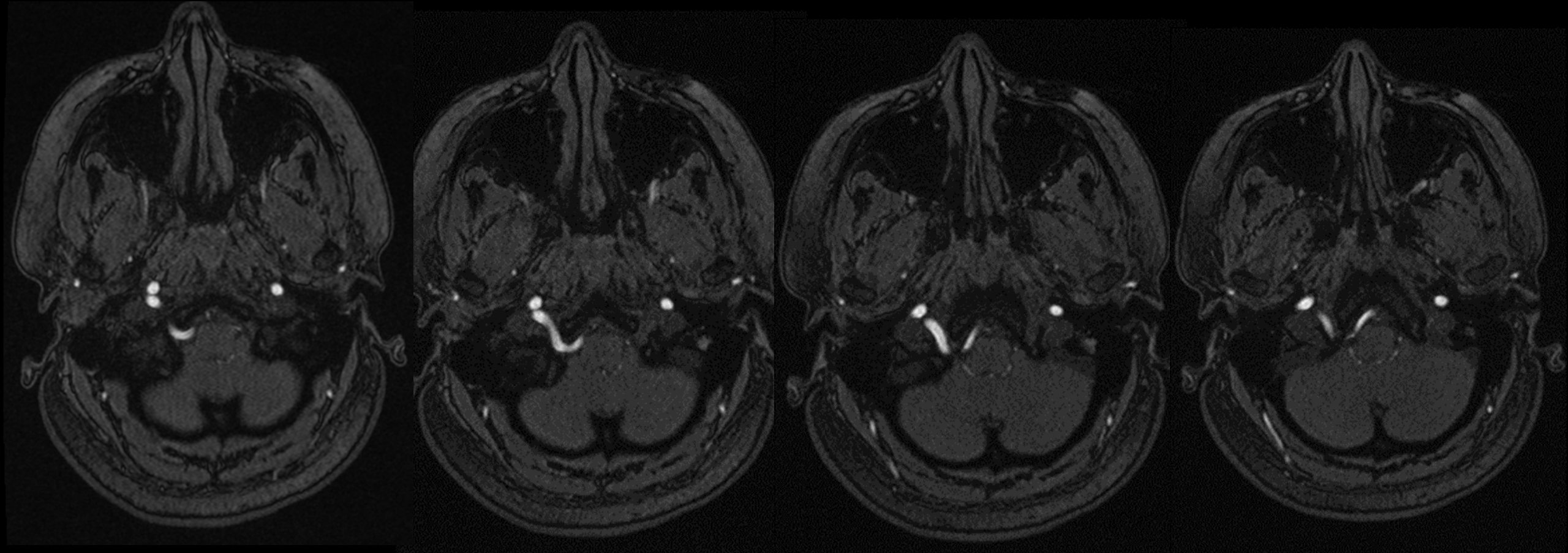
Origine extra-cranica della PICA



CLINICAL CASE

Paziente X	
Genere	F
Età	12 anni
Quesito clinico	Crisi epilettiche da circa 3 anni
Altre informazioni	<ul style="list-style-type: none">• APR muta• Nega farmaci• EEG negativo



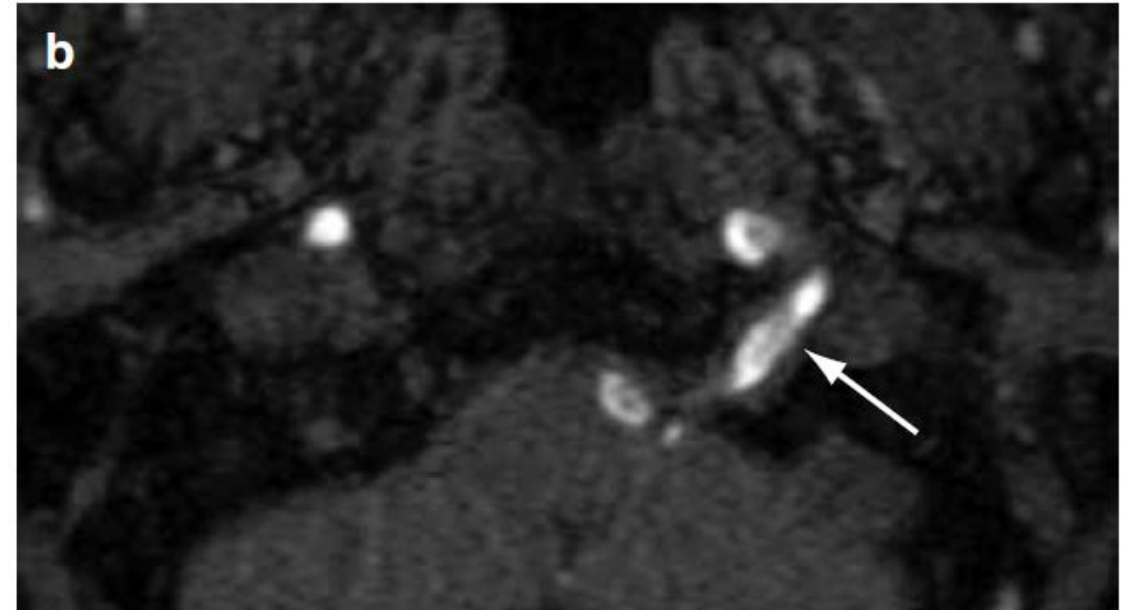




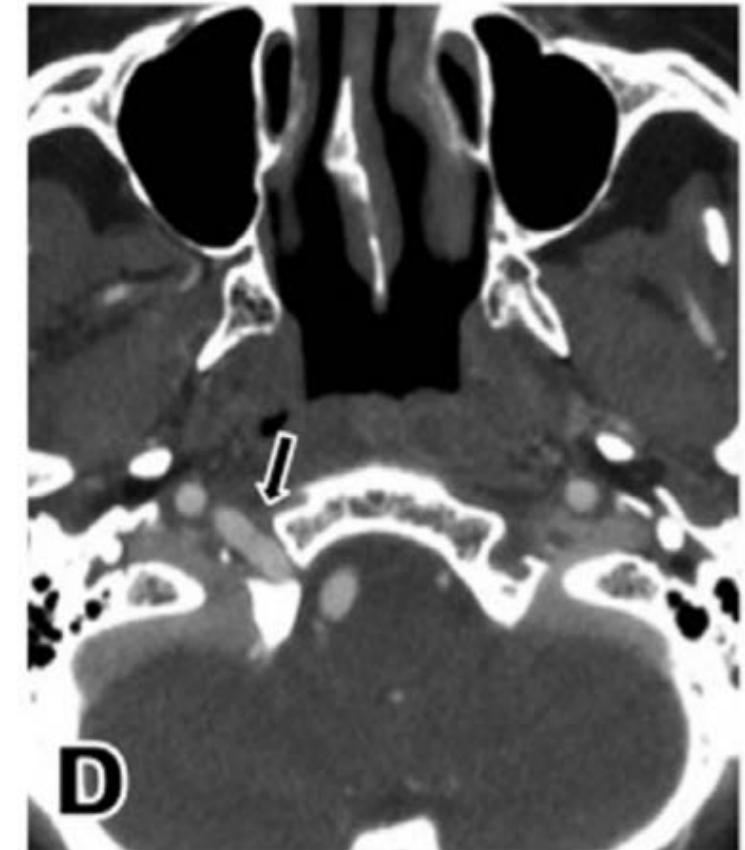
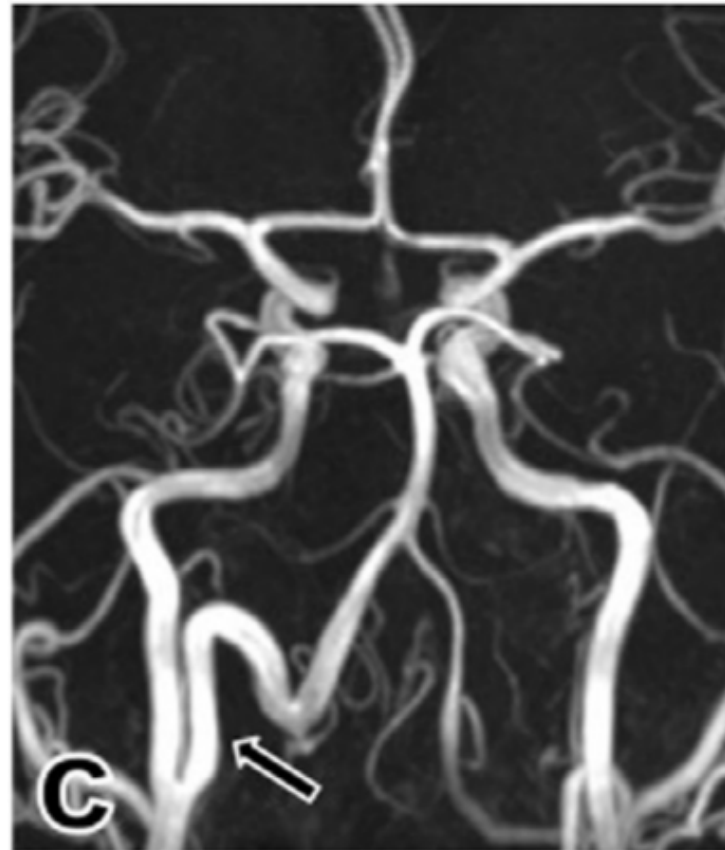
ARTERIA IPOGLOSSA PERSISTENTE

La seconda più frequente anastomosi carotido-vertebrale (0.02-0.26%)

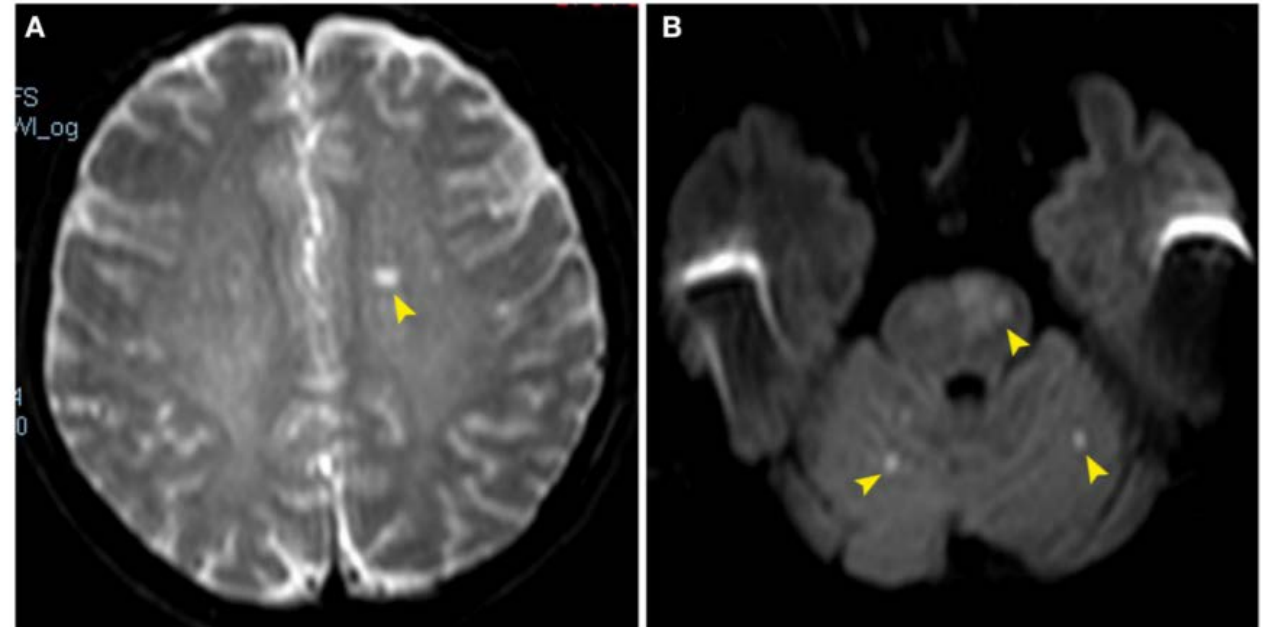
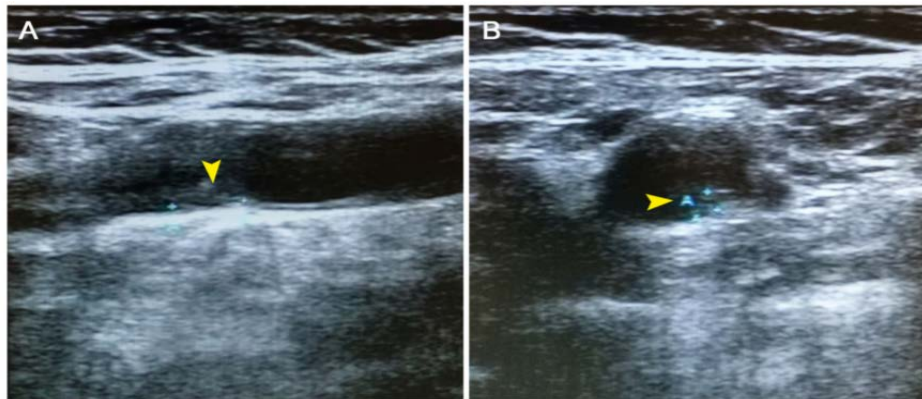
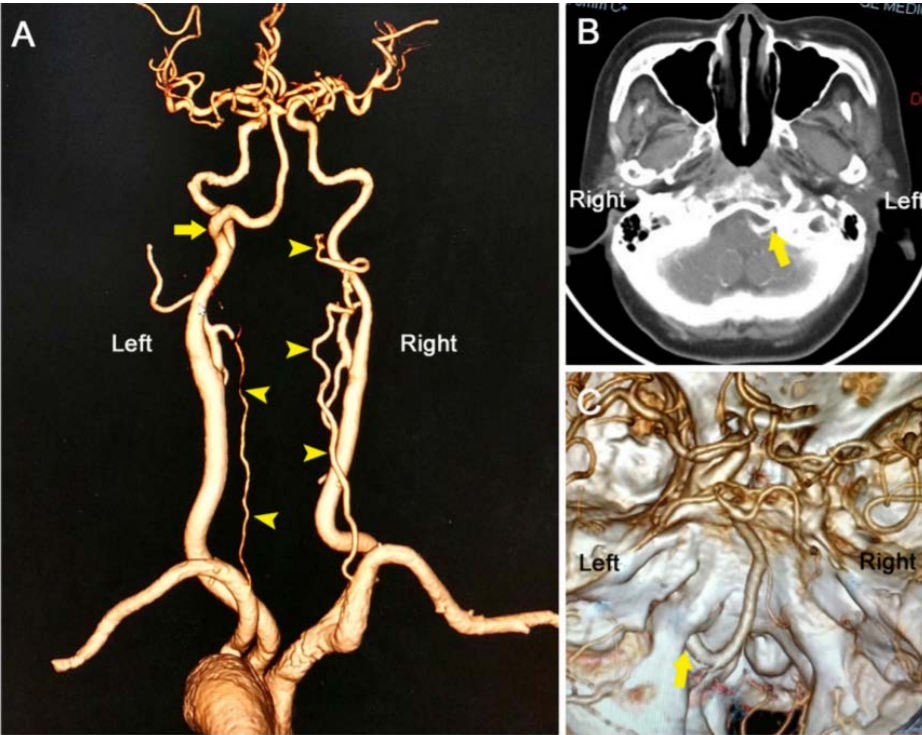
- Bilaterale in 1,4% dei casi
- Più frequente nelle donne e a sinistra
- Origina dal segmento cervicale della carotide interna, al livello di C1-C3.
- Se di grandi dimensioni, l'arteria vertebrale omolaterale può essere ipoplastica o assente.



Hypoglossal Nerve Palsy due to Compression by a Persistent Primitive Hypoglossal Artery: Case Report



Persistent Hypoglossal Artery as a Potential Risk Factor for Simultaneous Carotid and Vertebrobasilar Infarcts



ANASTOMOSI CAROTIDO-BASILARI

- Arteria trigeminale persistente (**0.1-0.6%**)
- Arteria ipoglossa persistente (**0.02-0.25%**)
- Arteria stapedia (**0,001%**)
- Arteria pro-atlantoidea

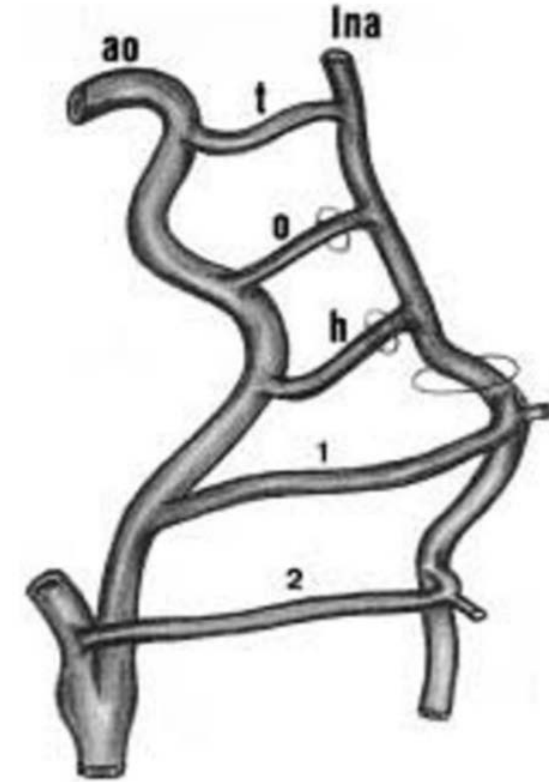
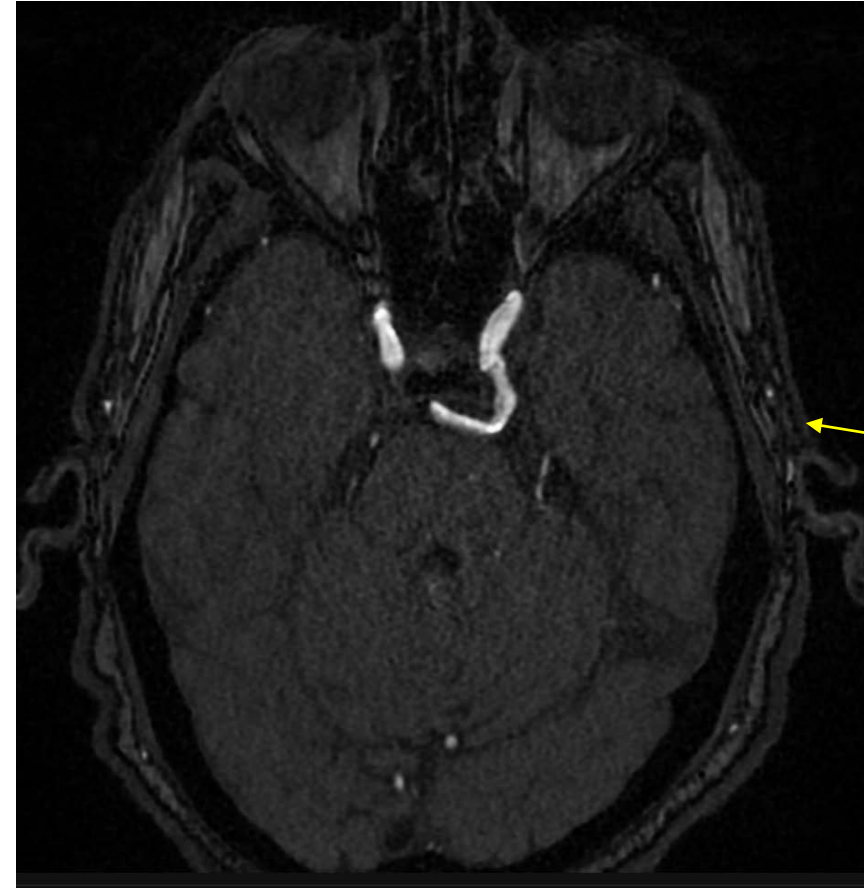
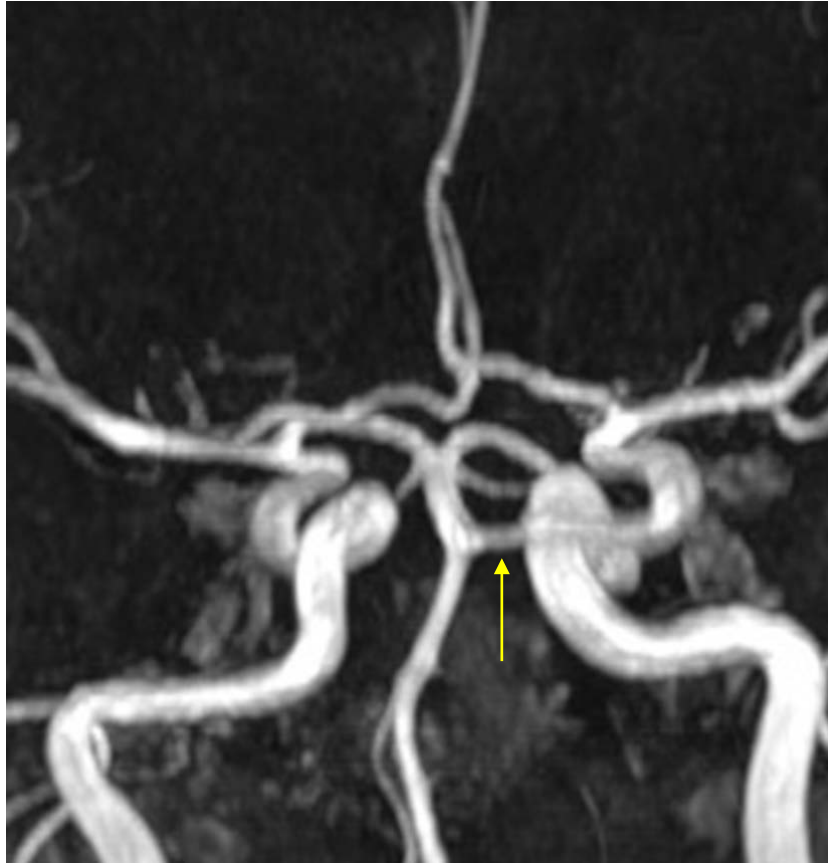


FIG. 3. – Lateral schematic representation of the embryonic carotid-vertebrobasilar anastomoses on the right side (according to P. Lasjaunias). Trigeminal (t), otic (o), hypoglossal (h) arteries, first segmental artery (Type I proatlantal) (1), second segmental artery (Type II proatlantal) (2), dorsal aorta (ao), longitudinal neural artery (lna).

ARTERIA TRIGEMINALE PERSISTENTE

La più comune anastomosi carotido-basilare embrionaria



ARTERIA TRIGEMINALE PERSISTENTE

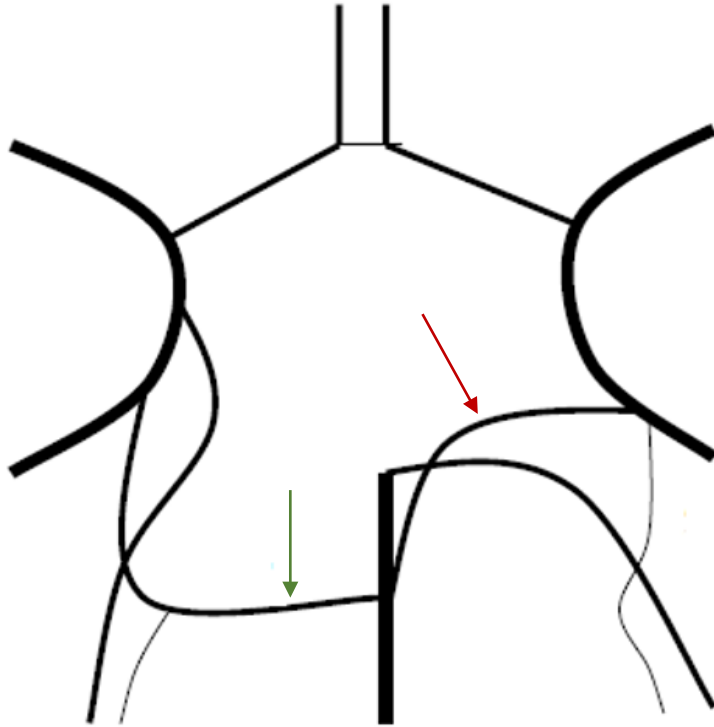


Figure 1. Two types of PTA according to **Saltzmann Classification**: **Lateral PTA** (green arrow) and **Medial PTA** (red arrow).

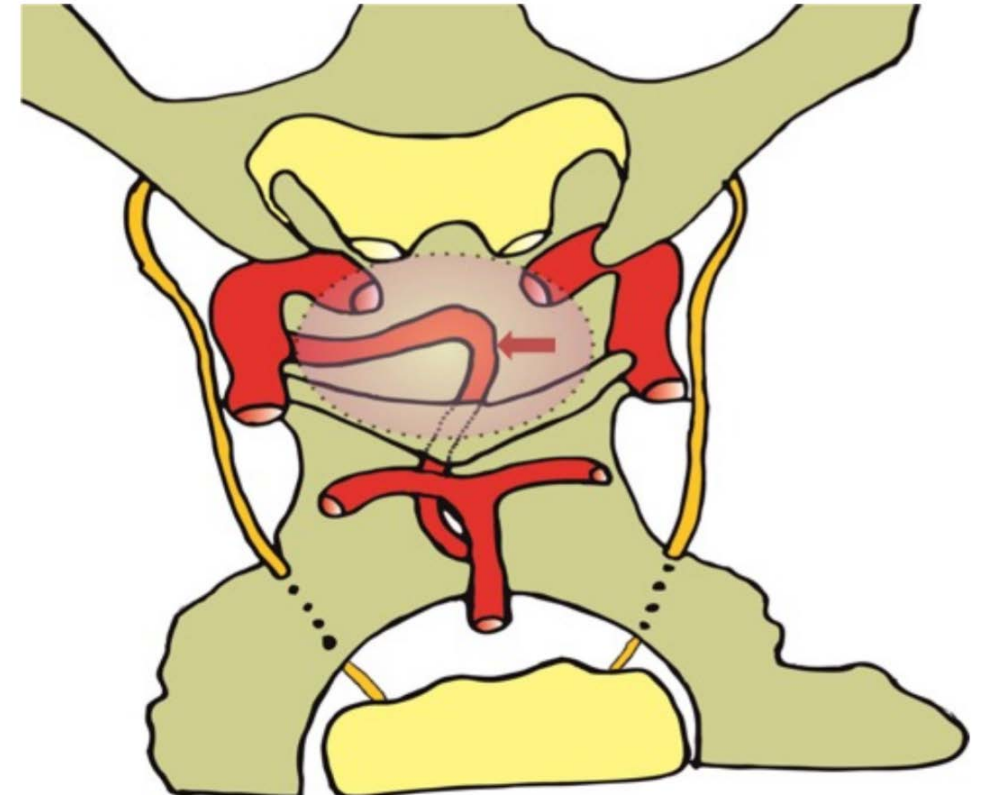
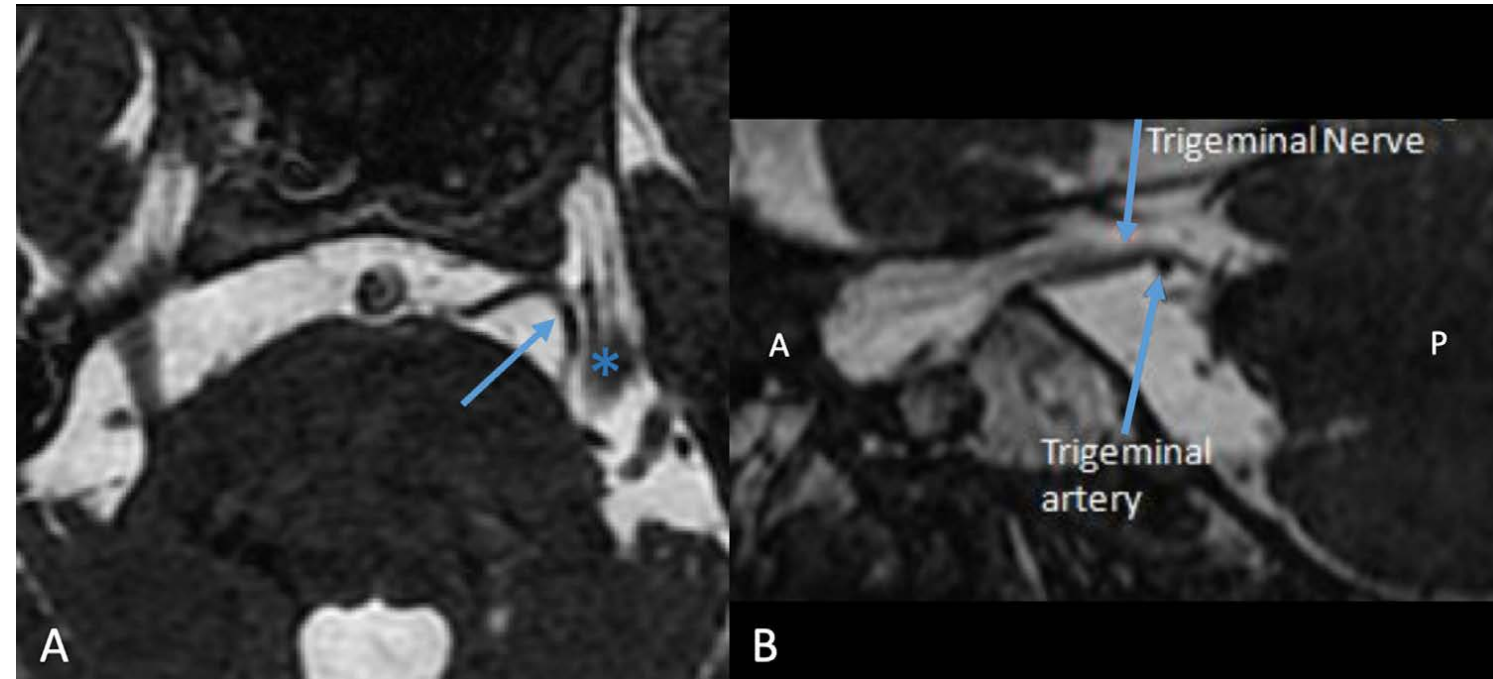


Figure 2. Diagrammatic illustration of the trans-sellar course of the PTA.

Trigeminal neuralgia associated with a variant of persistent trigeminal artery [☆]

Melissa M. Ling, MD^{a,*}, Megha Gupta, MD^a, Jay Acharya, MD^b





TAKE HOME MESSAGE

- Tipi di varianti anatomiche cerebrali
- Correlazione con la clinica → quasi sempre reperti asintomatici
- Approccio clinico-chirurgico



REFERENCES





Thank you
for your
attention