SERVIZIO SANITARIO REGIONALE
EMILIA-ROMAGNA
Azienda Ospedaliero - Universitaria di Ferrara

università di ferrara
DA SEICENTO ANNI GUARDIAMO AVANTI.

Neuroradiologia Interventistica

Dr. Andrea Saletti
Dirigente Medico I livello
Funzione di alta specialità

U.O Neuroradiologia (Direttore Dr.Riccardo Tamarozzi)
Dipartimento di Neuroscienze e Riabilitazione
Azienda Ospedaliero Universitaria S.Anna Ferrara

1936 primo intervento programmato su un Aneurisma Intracranico con clip di argento

Walter Dandy

1964 **Prime “navigazioni endovascolari” intracraniche**

Luessenhop e Velasquez

Neurochirurghi Georgetown University Hospital (Washington D.C)

1974 **Primo intervento endovascolare di aneurisma cerebrale trattato con palloncino staccabile**

Prof. Serbinenko

René Djindjian
1918–1977

1977, Giuseppe Scialfa, all'Ospedale Niguarda di Milano, inizia le embolizzazioni delle fistole carotido-cavernose con i palloncini staccabili di Debrun.

1983, Guido Guglielmi presenta i primi risultati sperimentali dell'elettrocoagulazione. Questa sua ricerca lo portera' a presentare al Symposium Neuroradiologicum di Londra la proposta di embolizzazione degli aneurismi endocranici con spirali staccabili.
La ricerca relativa, che ha avuto un grandissimo successo mondiale, viene sviluppata da Guglielmi all'Universita' di Los Angeles dove egli si trasferisce verso la fine degli anni '80.


ABC-WIN seminar
Since 1980
Val d'Isère

Prof. Casasco
Parigi Hopital La pitiè Salpetriere

Prof. Houdart
Parigi Hopital La Riboisiere

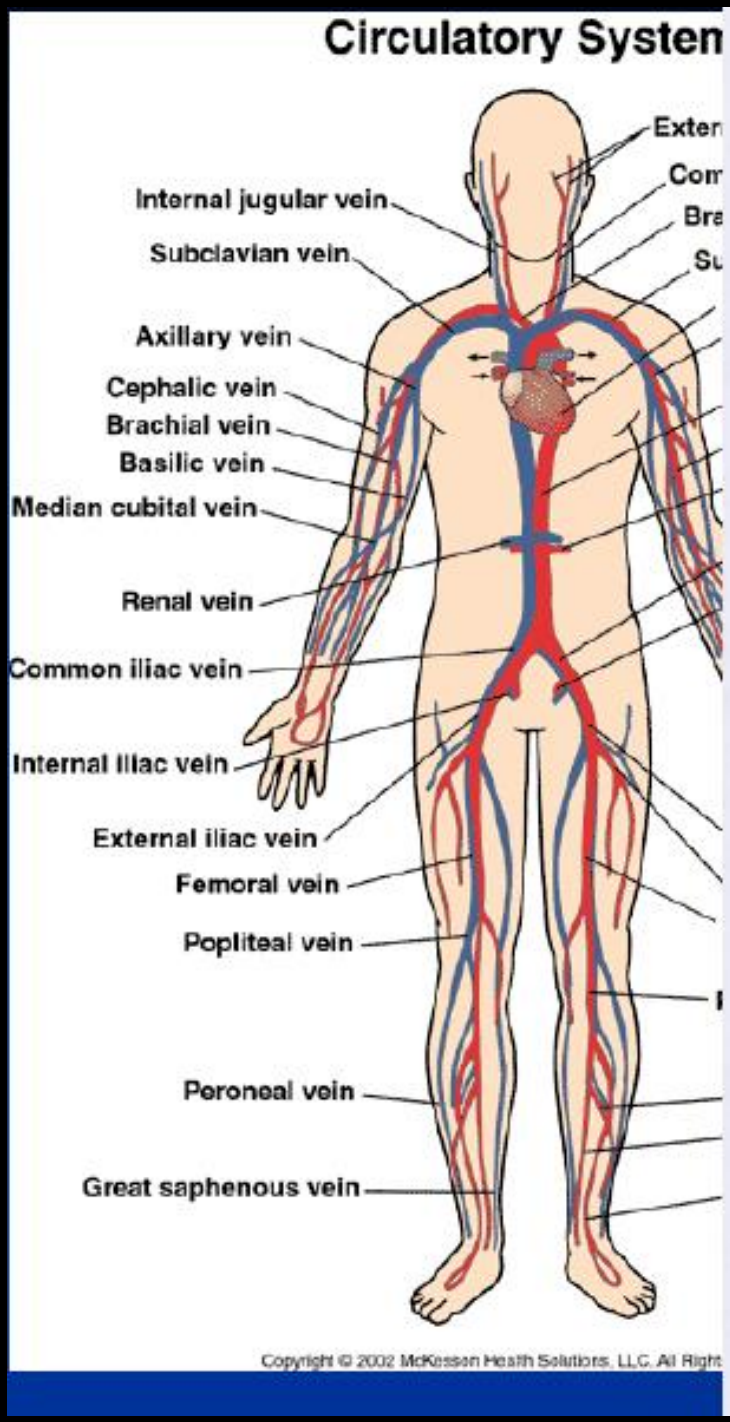
Italia

134 Centri di Neurochirurgia

60 Centri di Neuroradiologia atrezzati per terapie endovascolari

75 Neuroradiologi Interventisti

Dati 2008


Circulatory Systen
Internal jugular vein
Subclavian vein
Axillary vein
Cephalic vein
Brachial vein
Basilic vein
Median cubital vein
Renal vein
Common iliac vein
Internal iliac vein
External iliac vein
Femoral vein
Popliteal vein
Peroneal vein
Great saphenous vein
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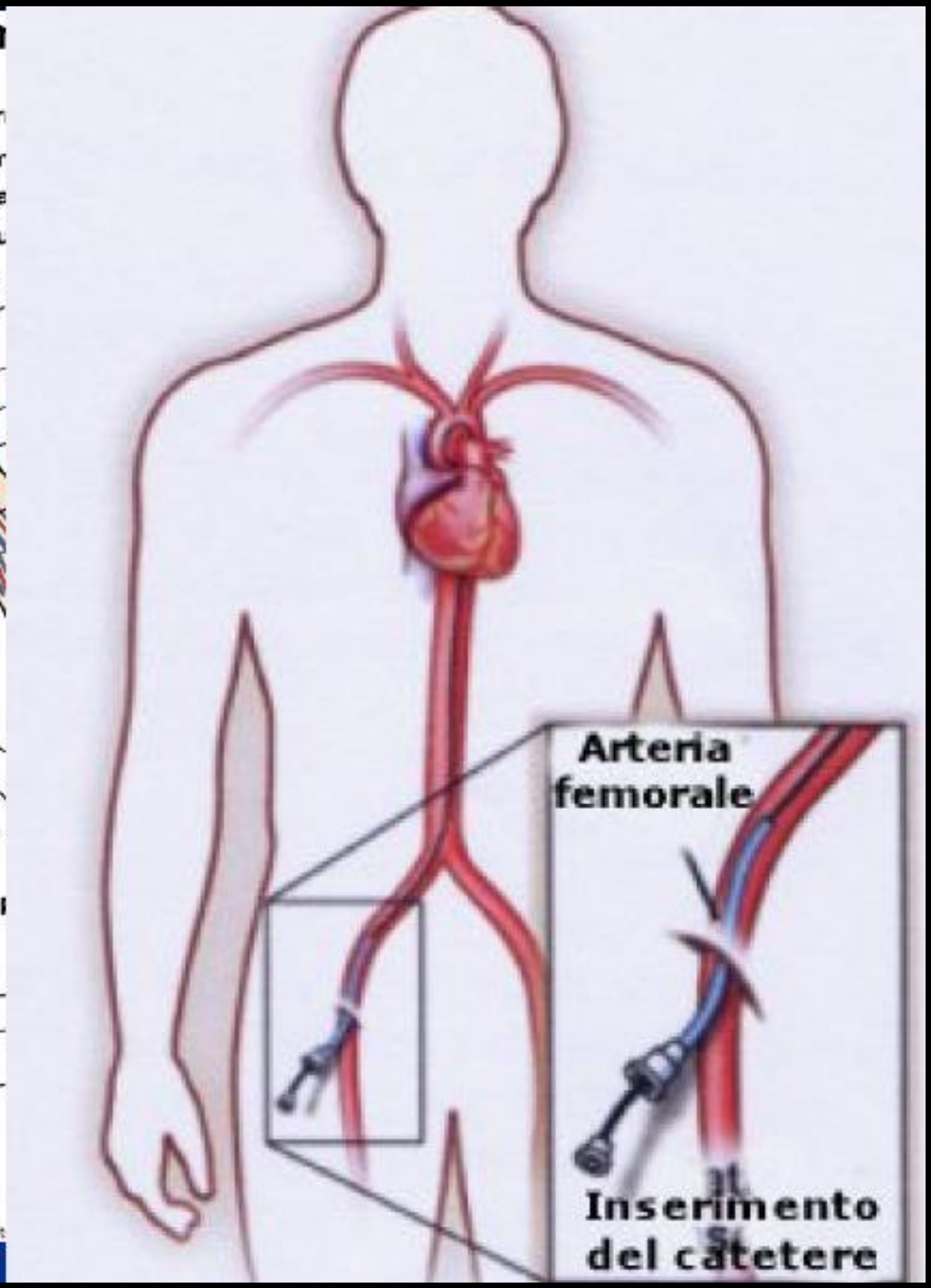
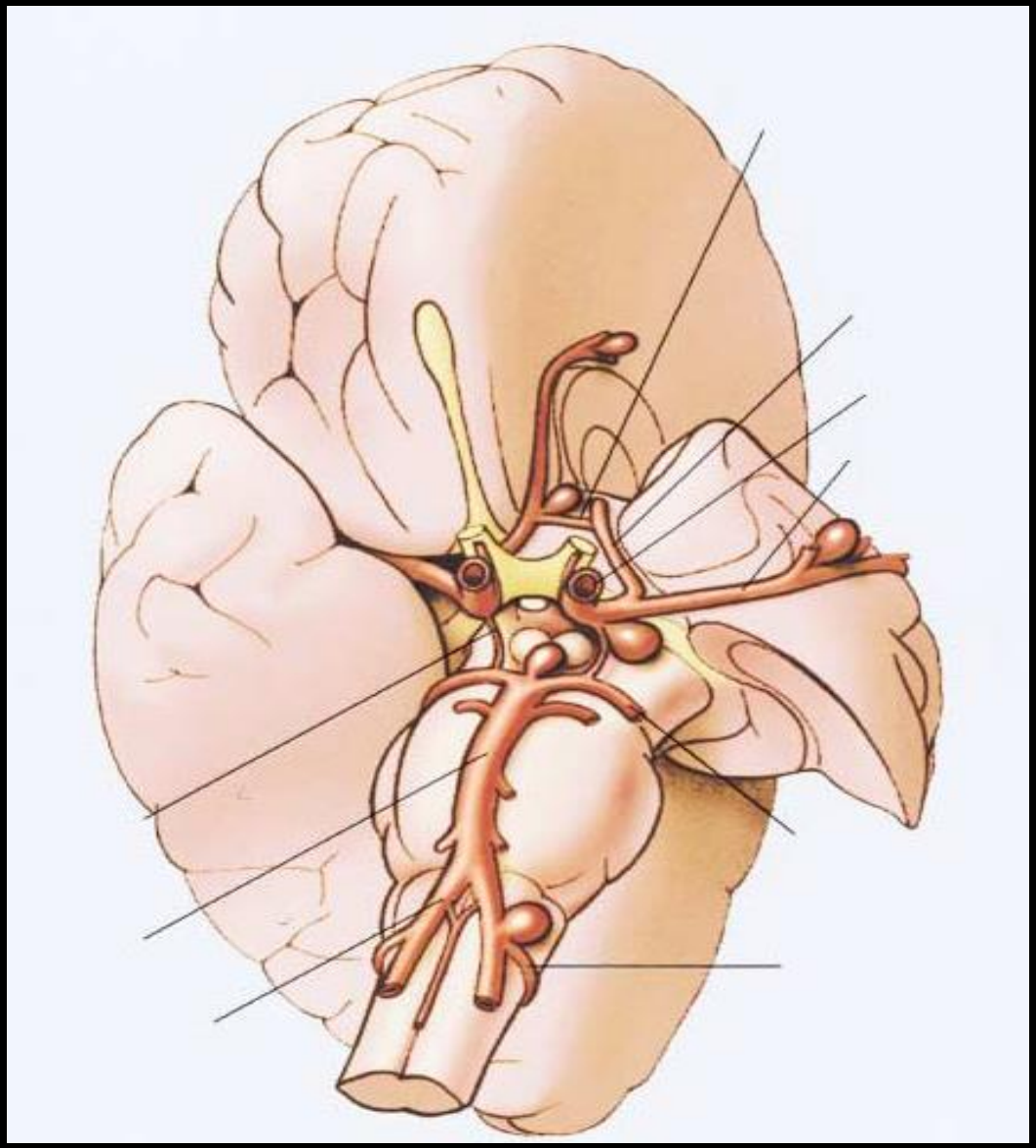

Arteria femorale
Inserimento del catetere

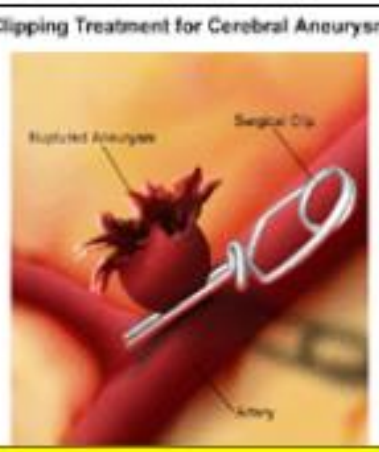
ANEURISMI CEREBRALI

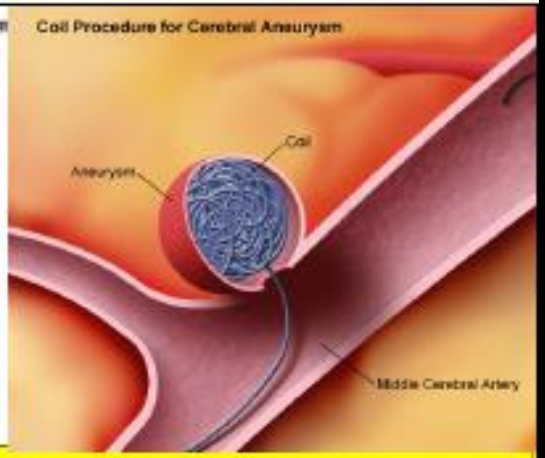


EMORRAGIA SUBARACNOIDEA

5% di tutti gli stroke
Picco di incidenza 40-60 anni
10/100.000 abitanti per anno
Femmine/Maschi 1.6/1
40% decede prima del ricovero
Indice di mortalità a 30 gg 50%
Fra i sopravvissuti 50% disabilità

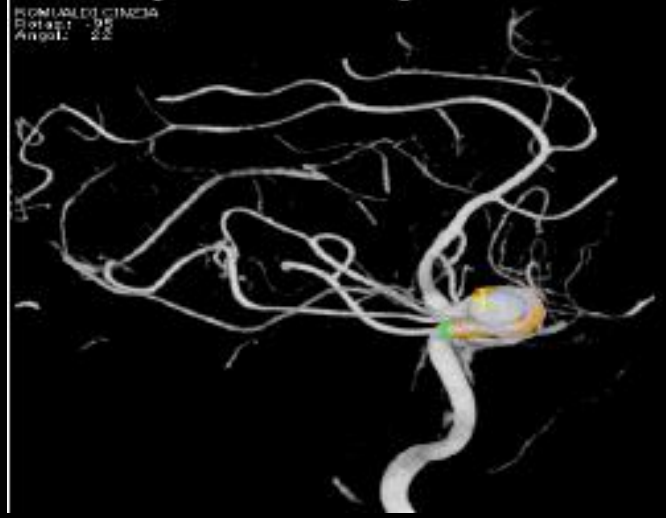
Aneurismi cerebrali
Clip or coil?
Trattamento endovascolare

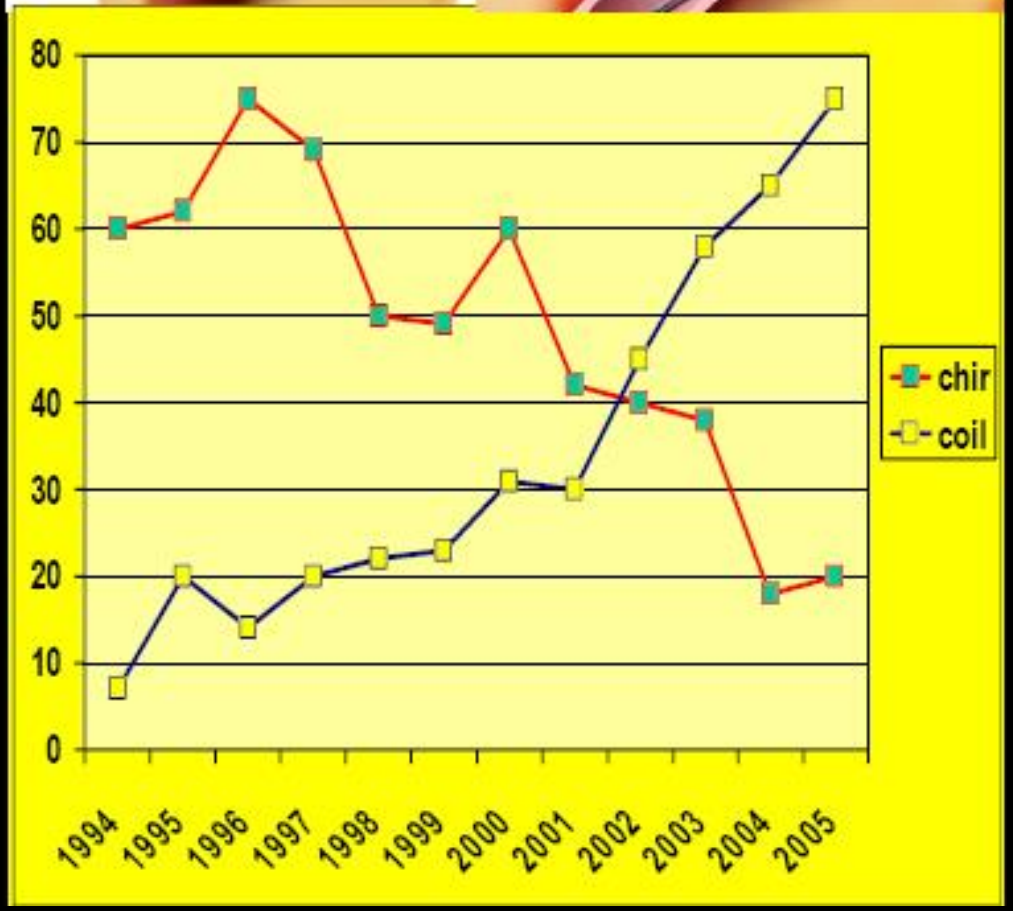


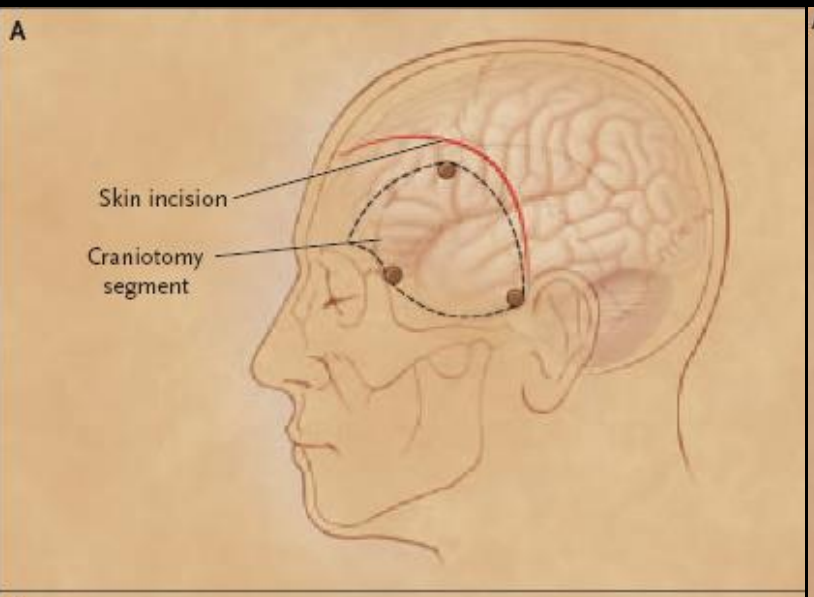


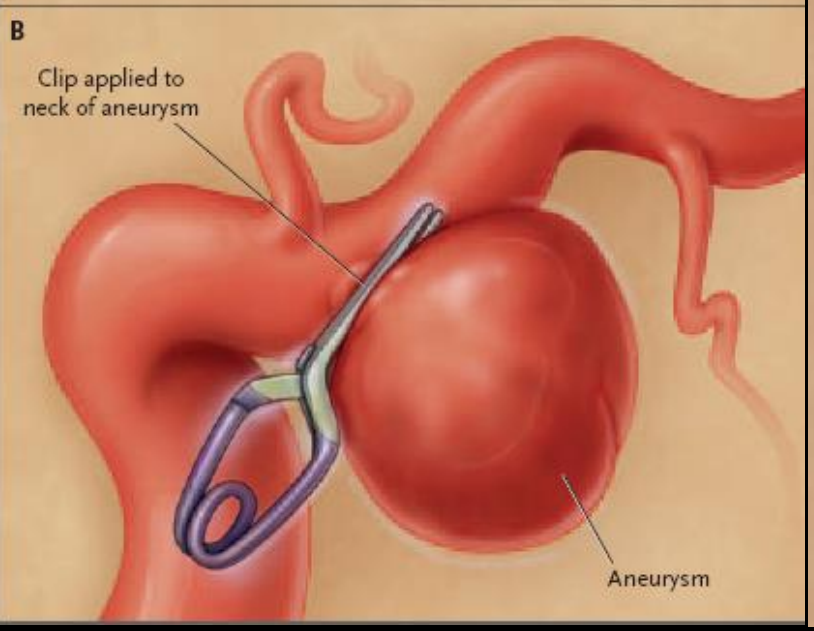
-Vantaggi terapeutici

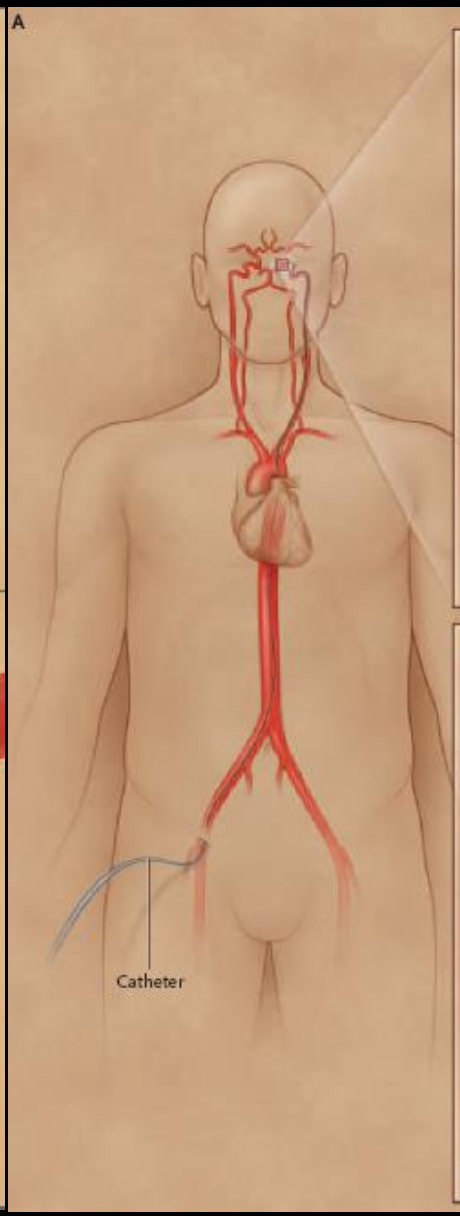
-Minor invasività
- Velocità (45' – 120')
- Più aneurismi nella stessa seduta
- Integrazione diagnostico-terapeutica (ultra-early)

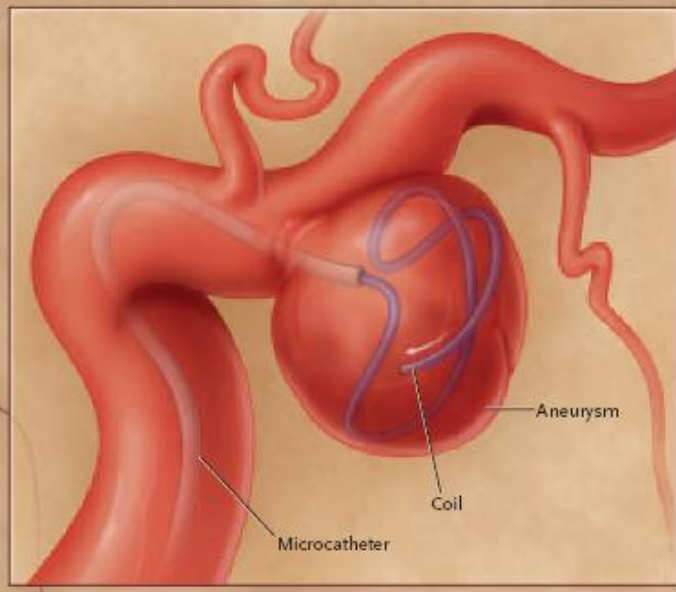


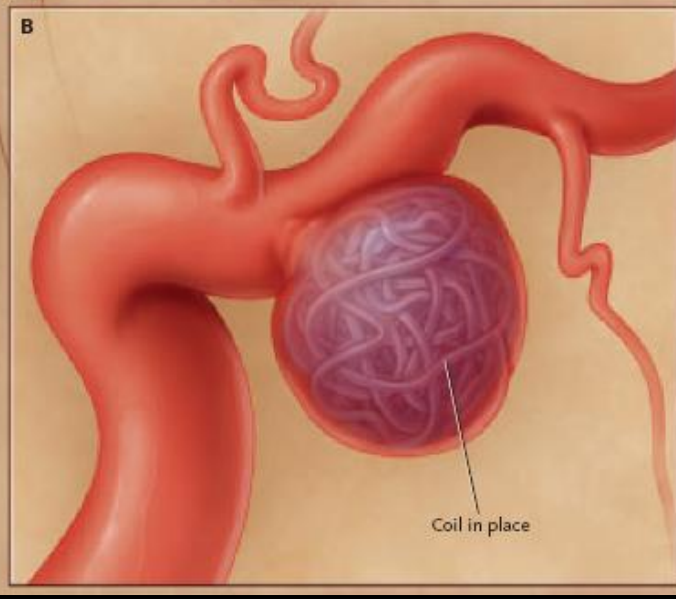


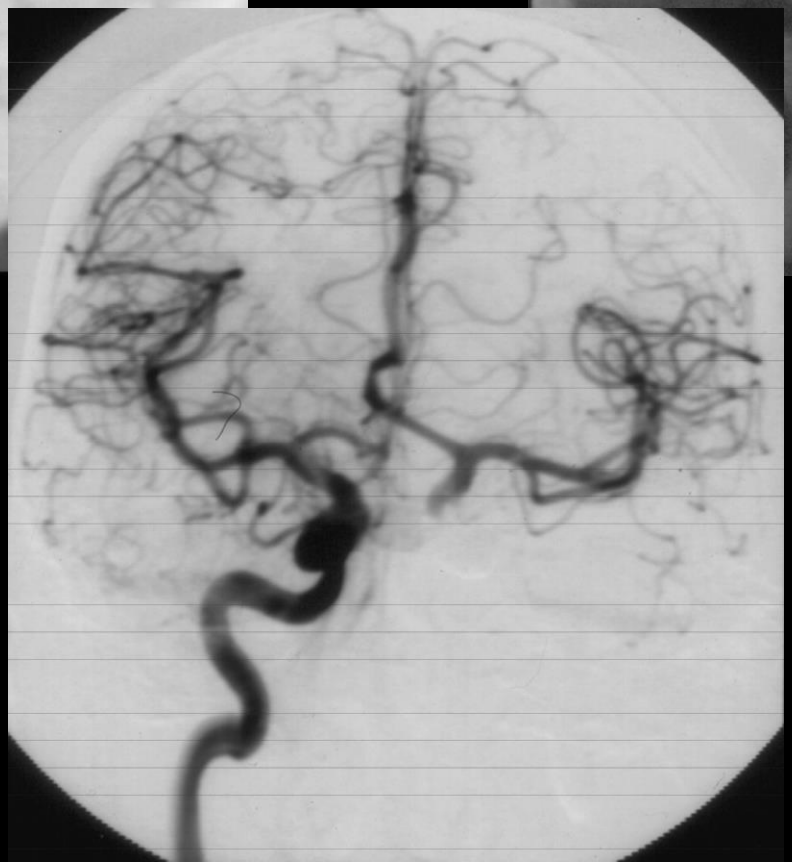

A
Skin incision
Craniotomy segment


B
Clip applied to neck of aneurysm
Aneurysm

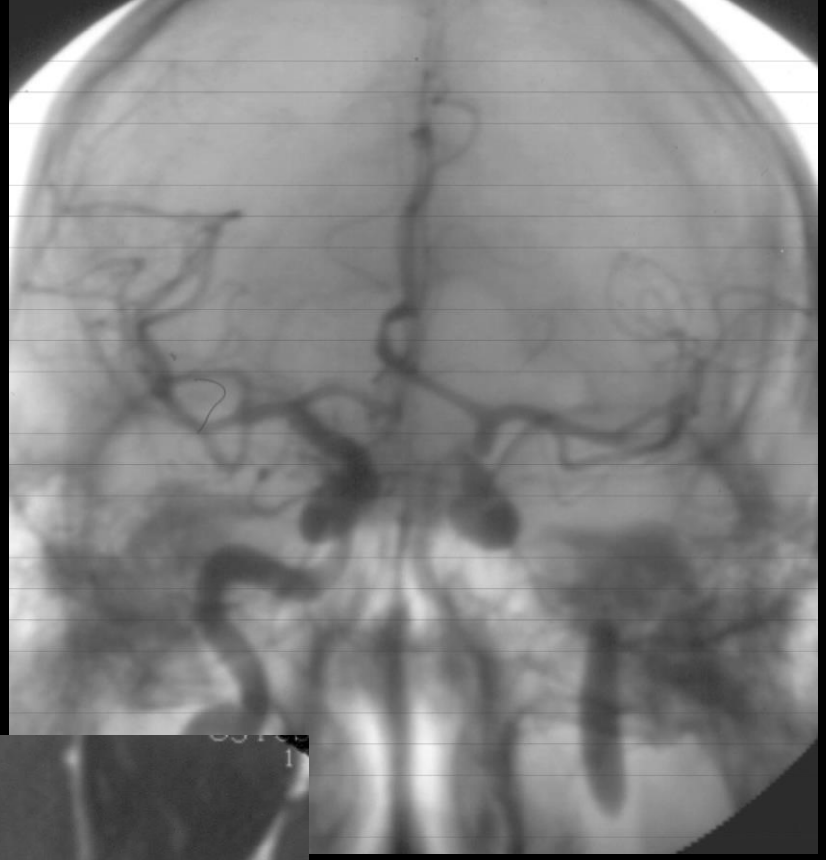

A
Catheter

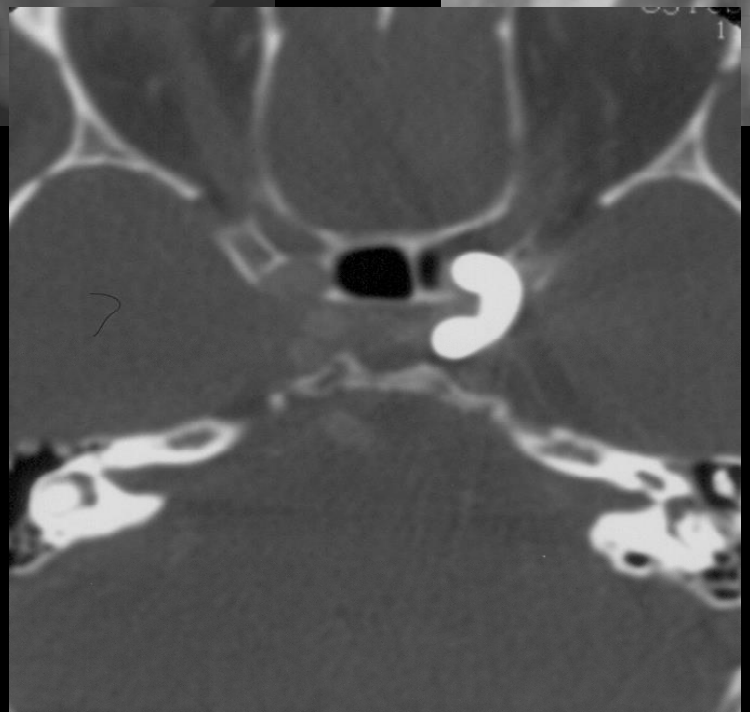

Aneurysm
Coil
Microcatheter


B
Coil in place



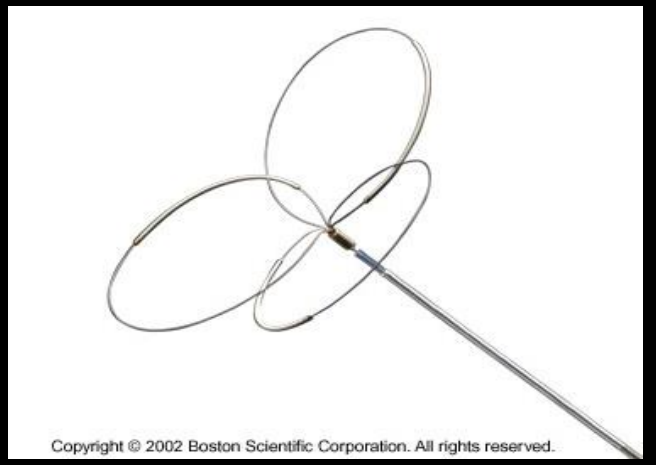
Gennaio 2000
Uomo 38 aa
ESA + ematoma fronto basale





35/5-2 F


Spirale (GDC)
Zona di Distacco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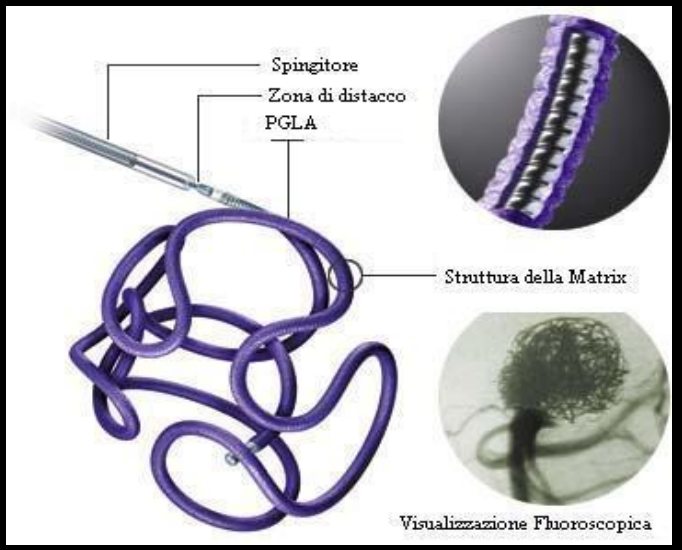
Spingitore
Zona di distacco
PGLA
Struttura della Matrix
Visualizzazione Fluoroscopica


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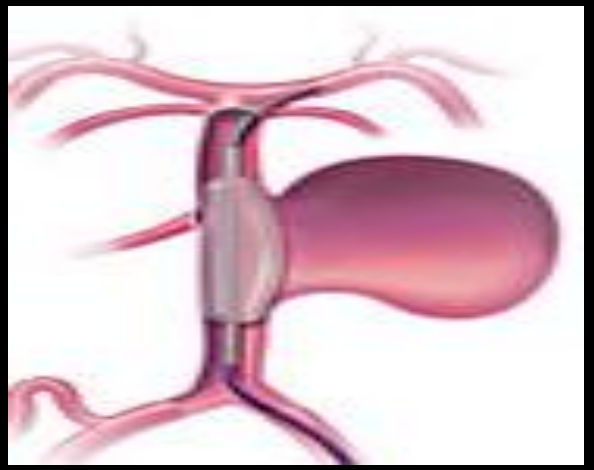
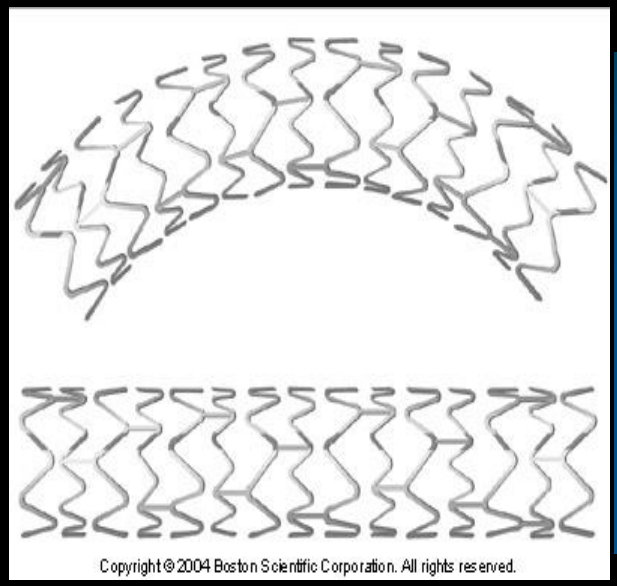
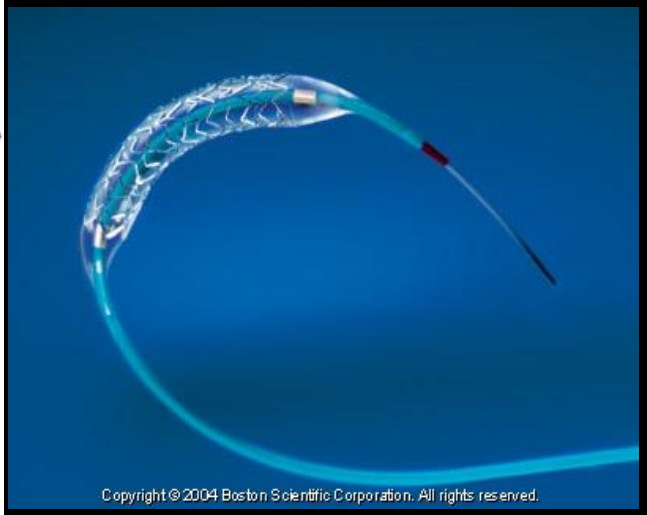
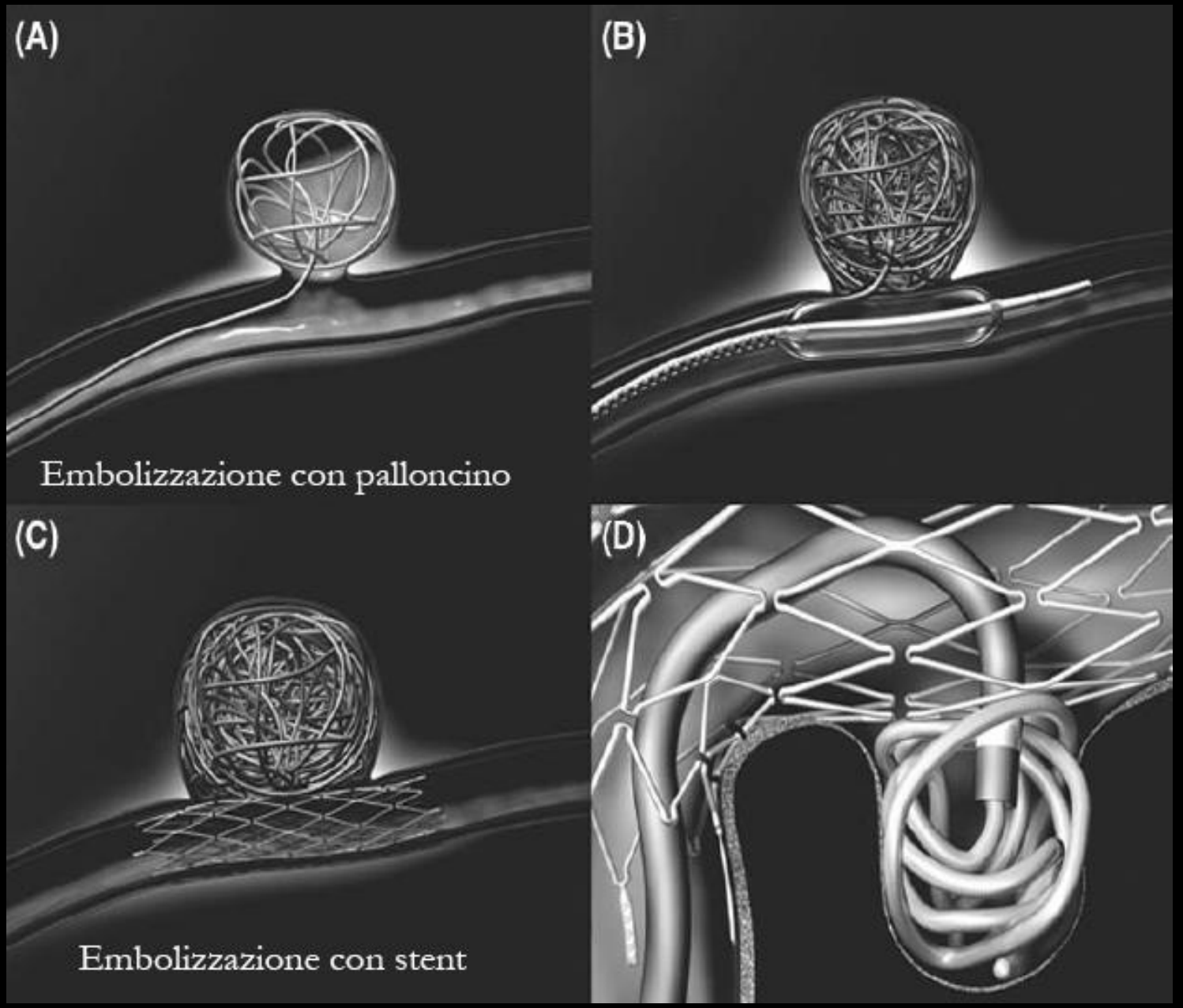
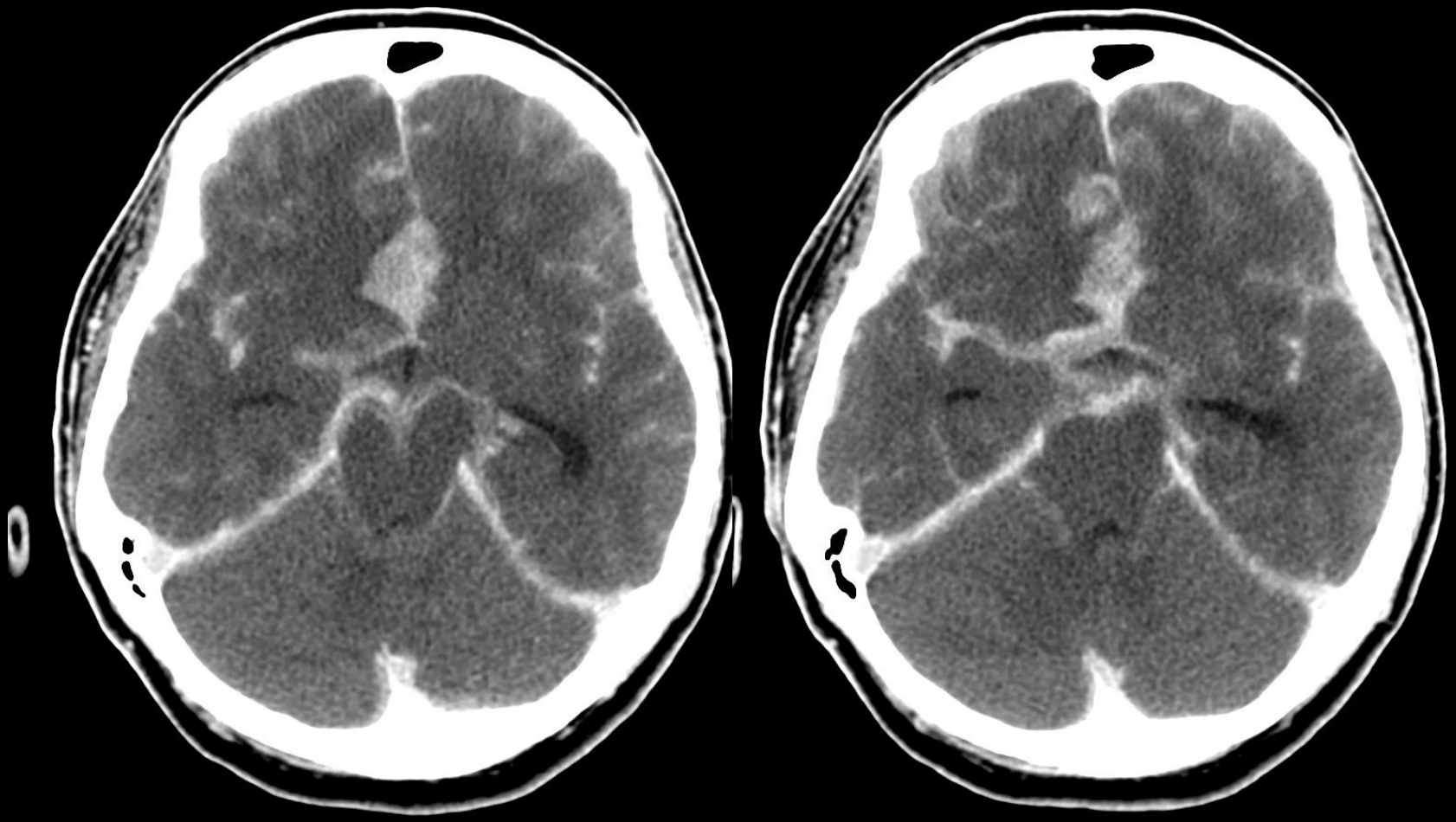







(A)
(B)
Embolizzazione con palloncino
(C)
(D)
Embolizzazione con stent

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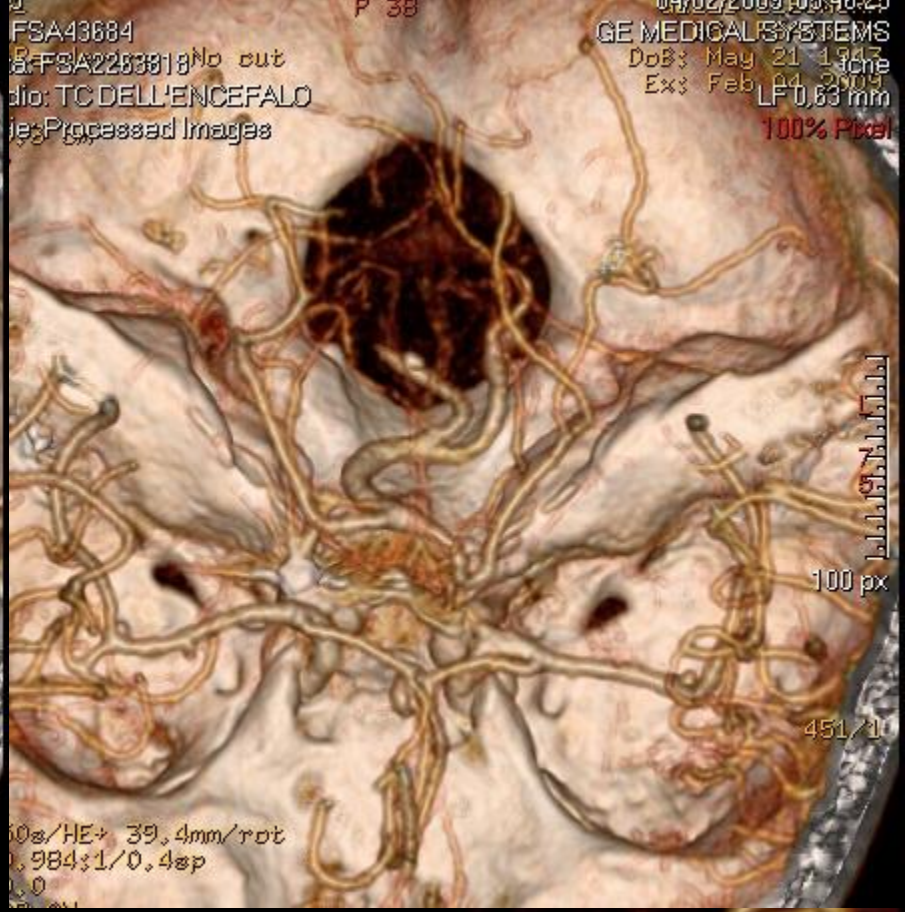
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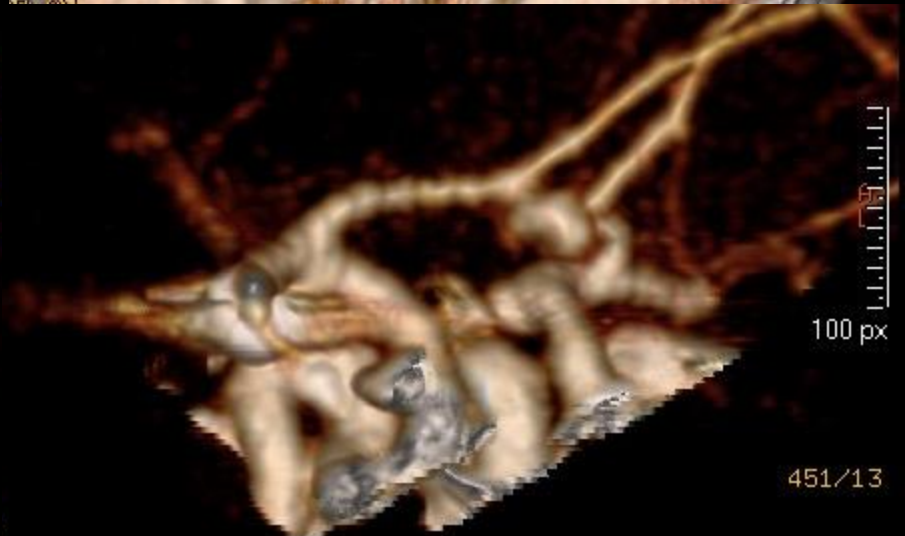
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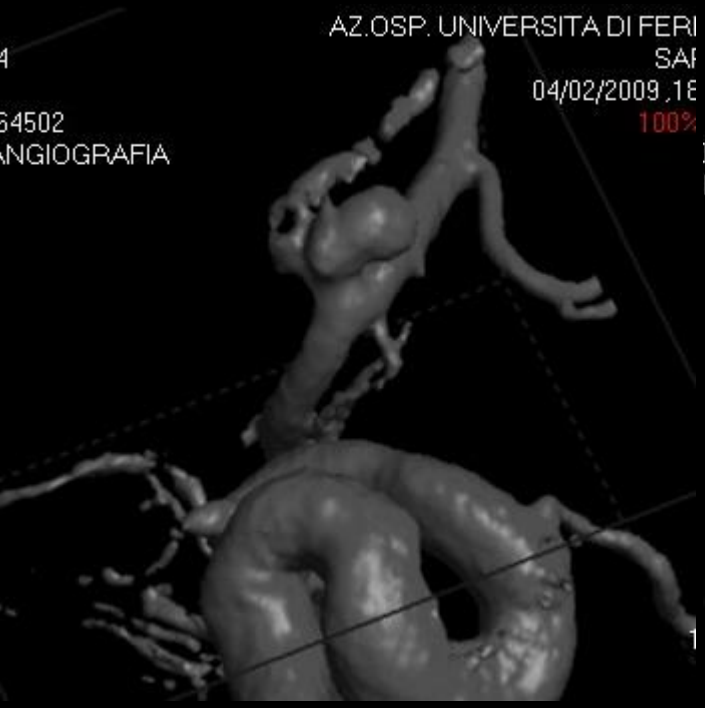
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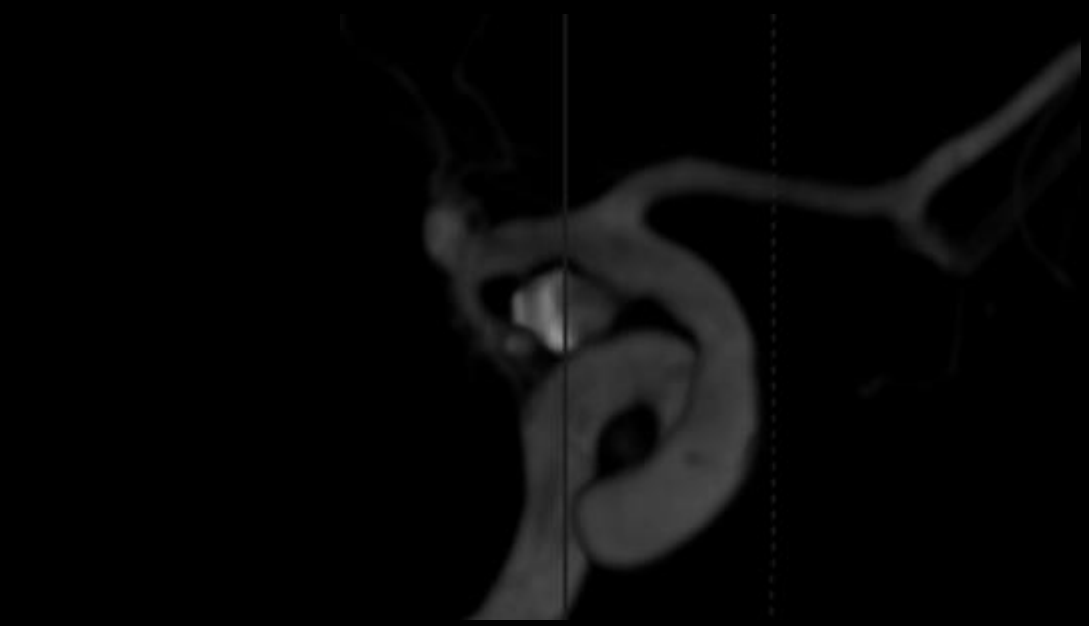

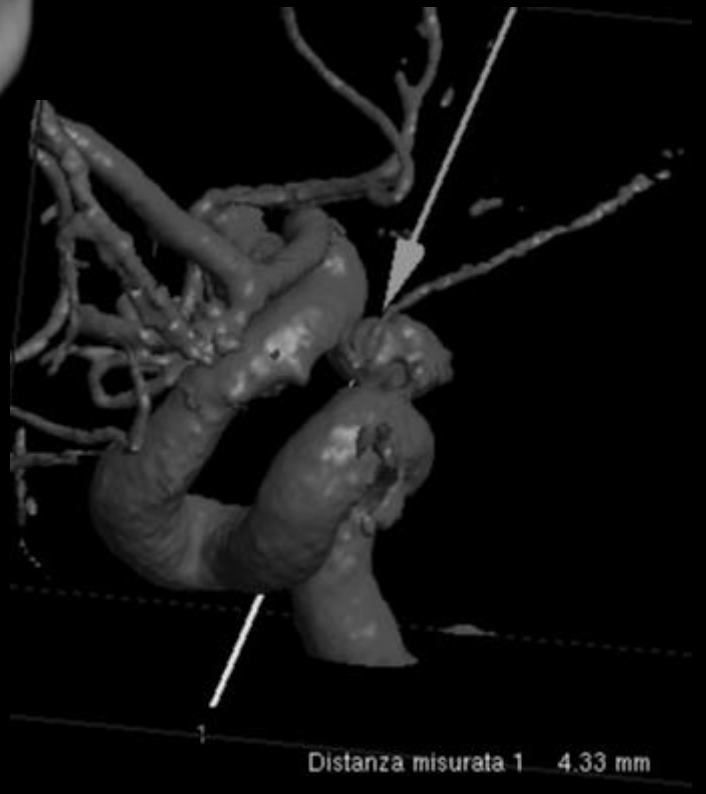
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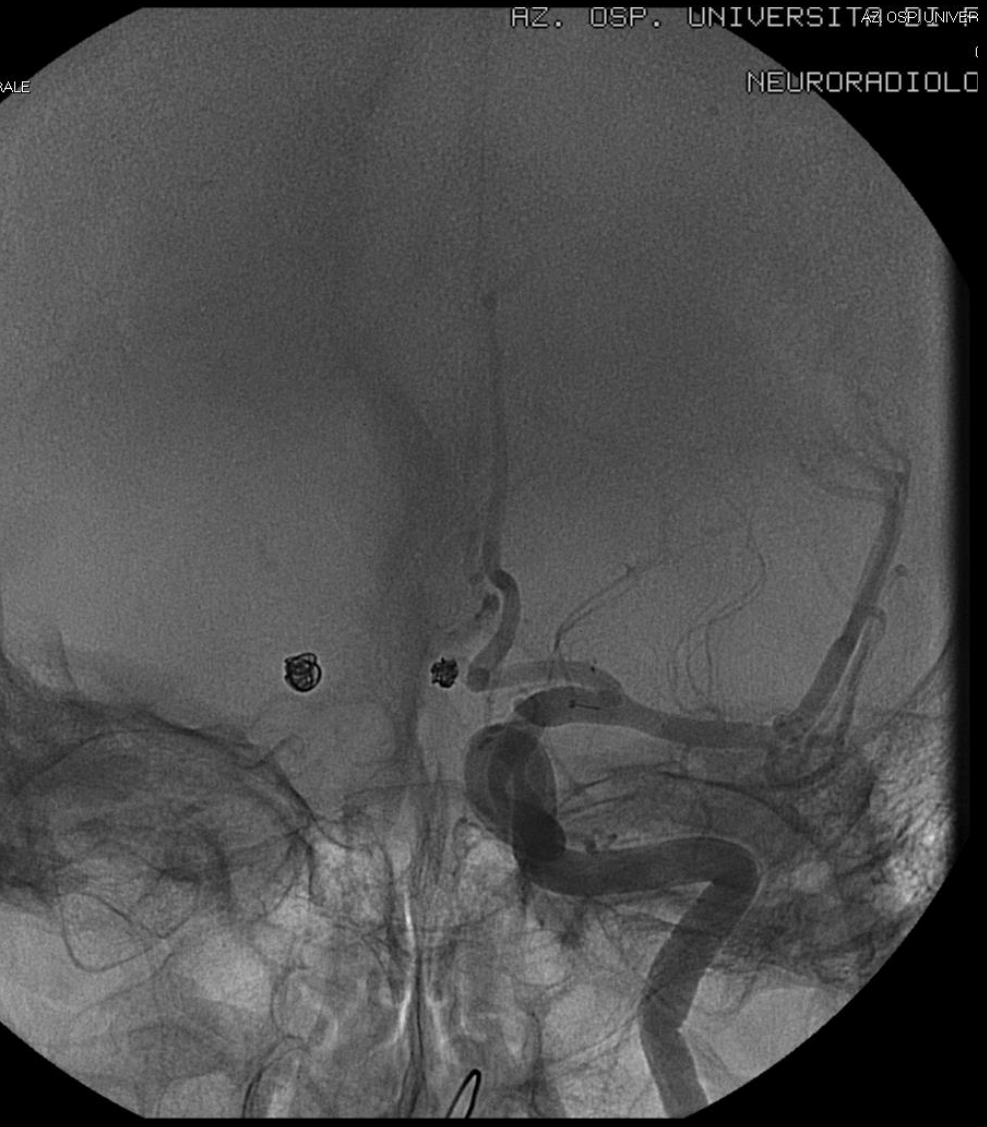
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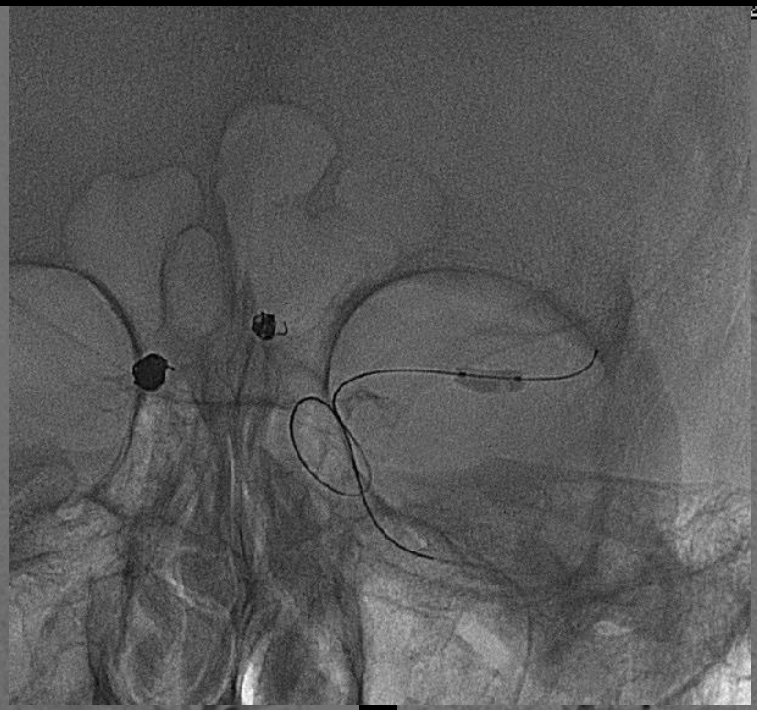



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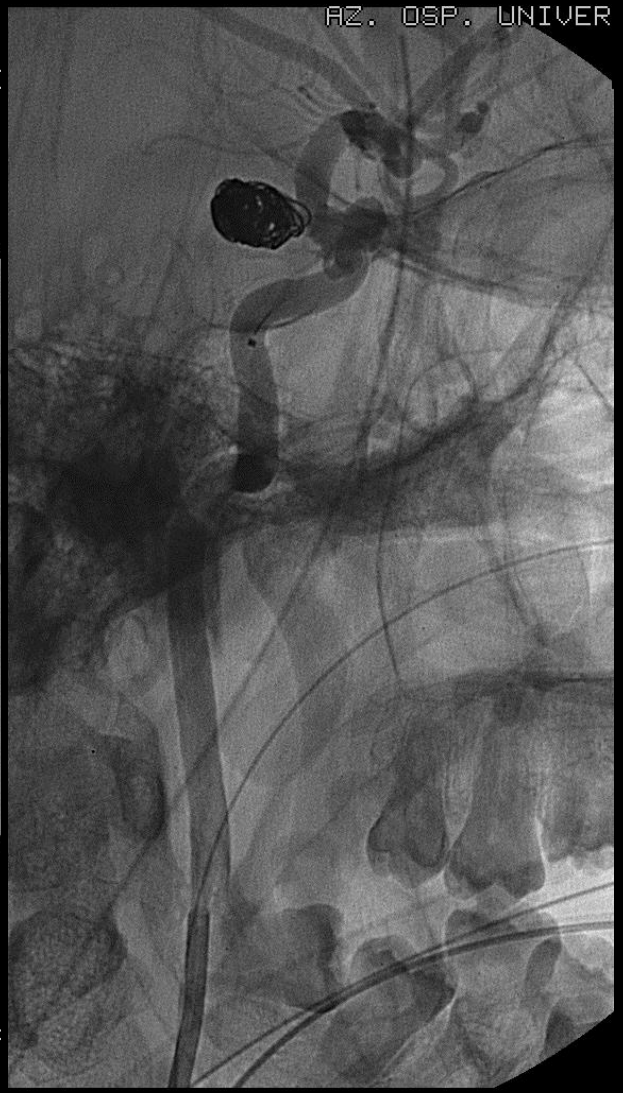
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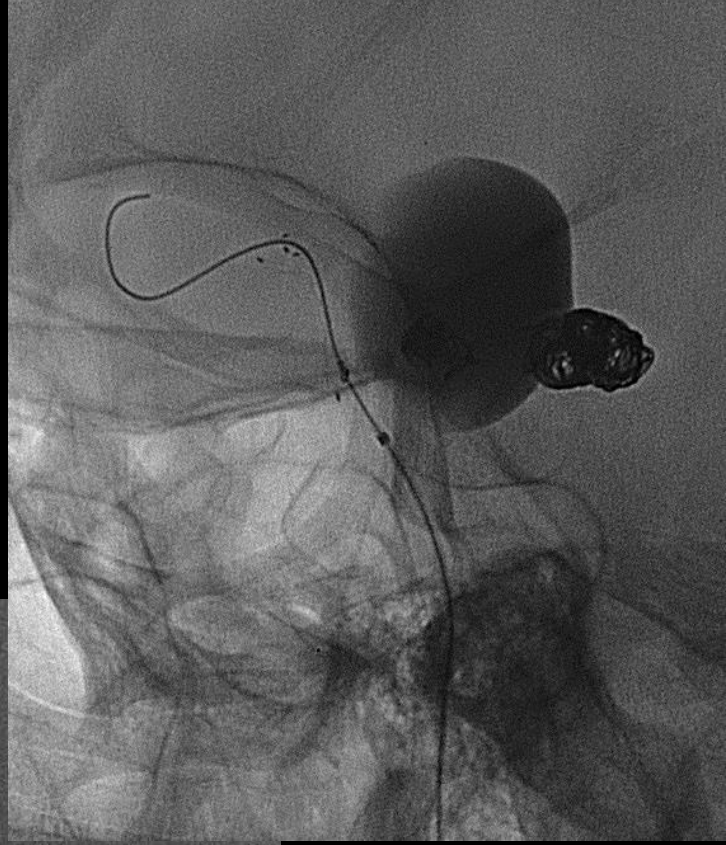

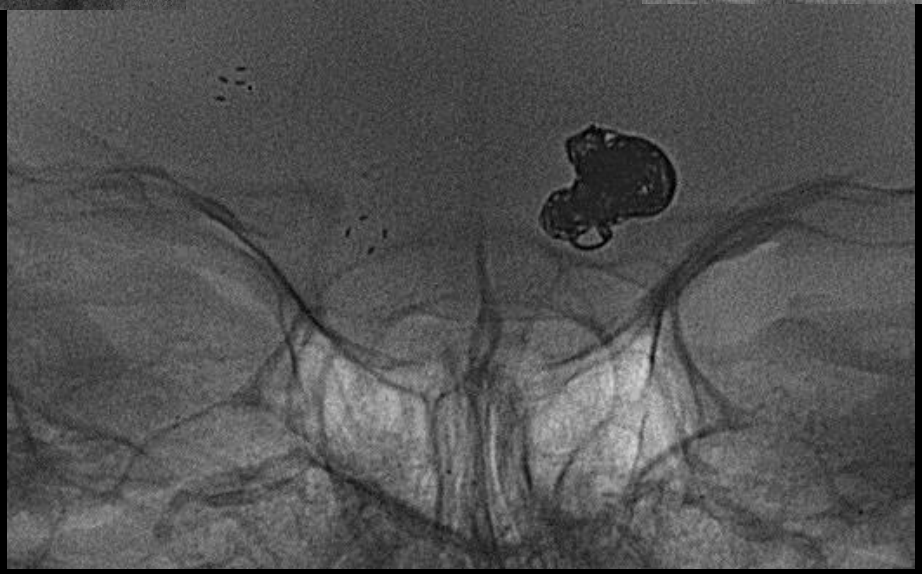

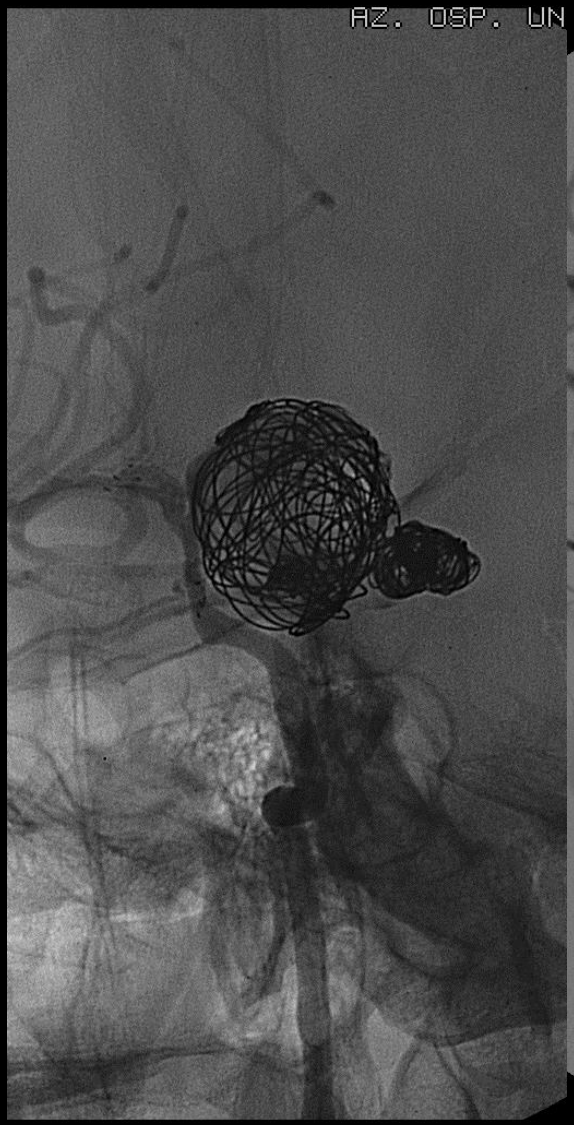
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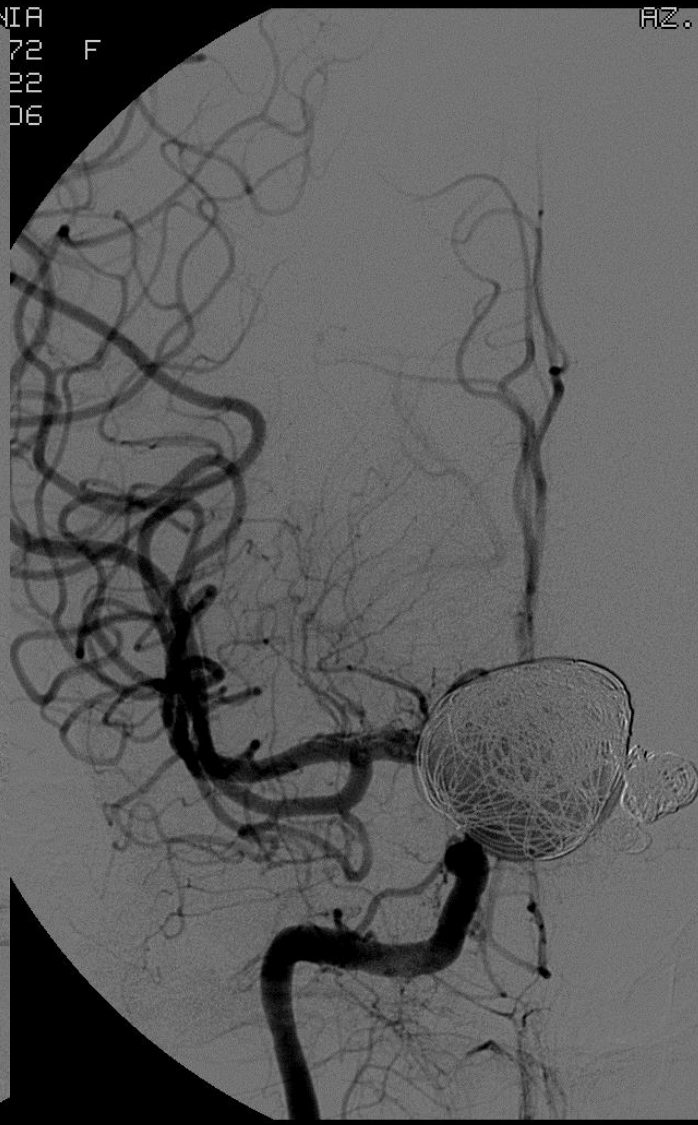
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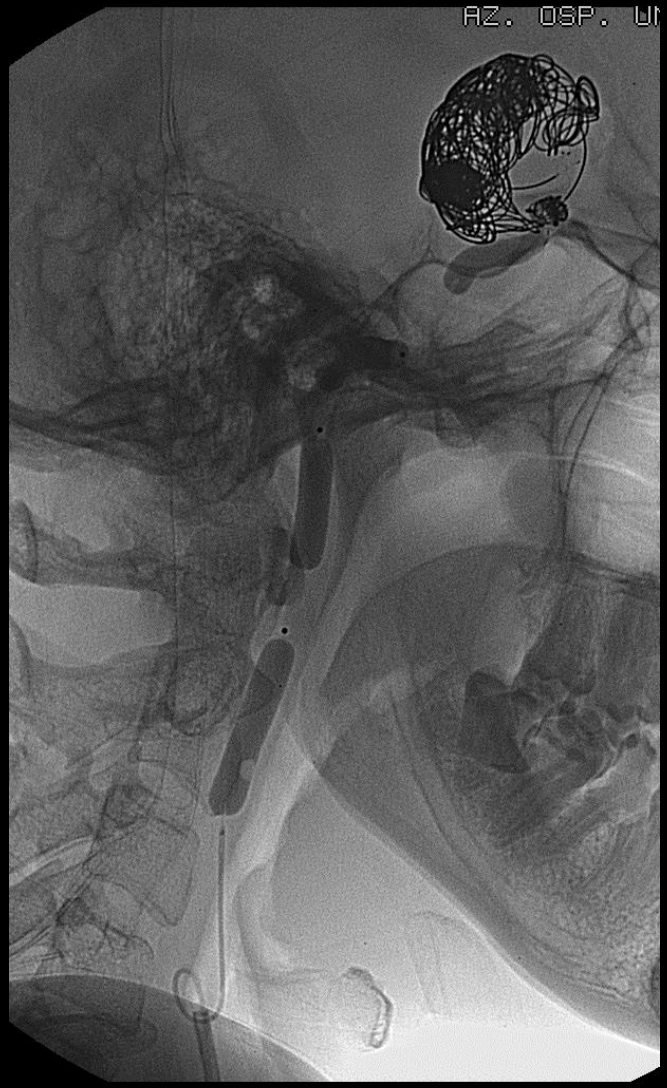

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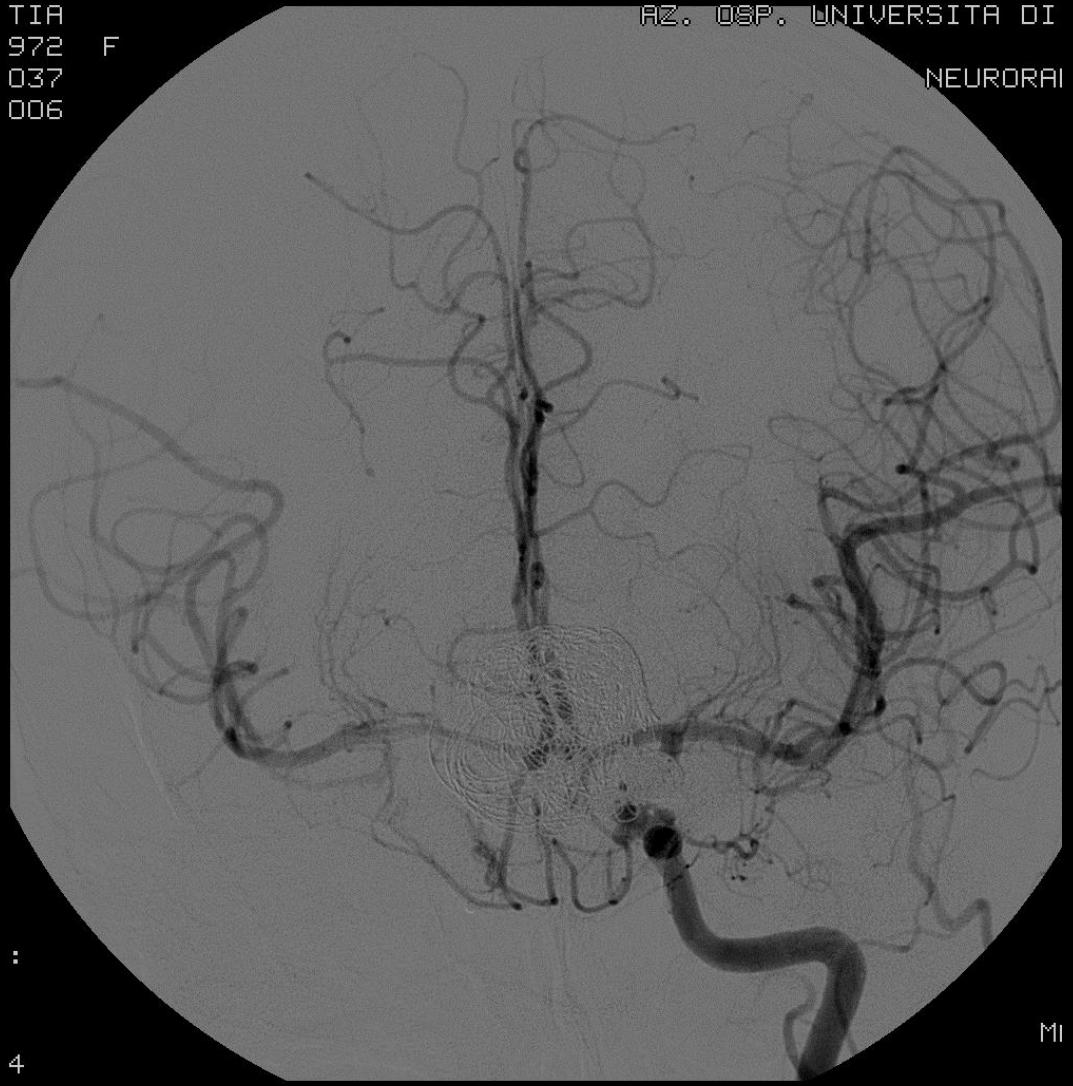

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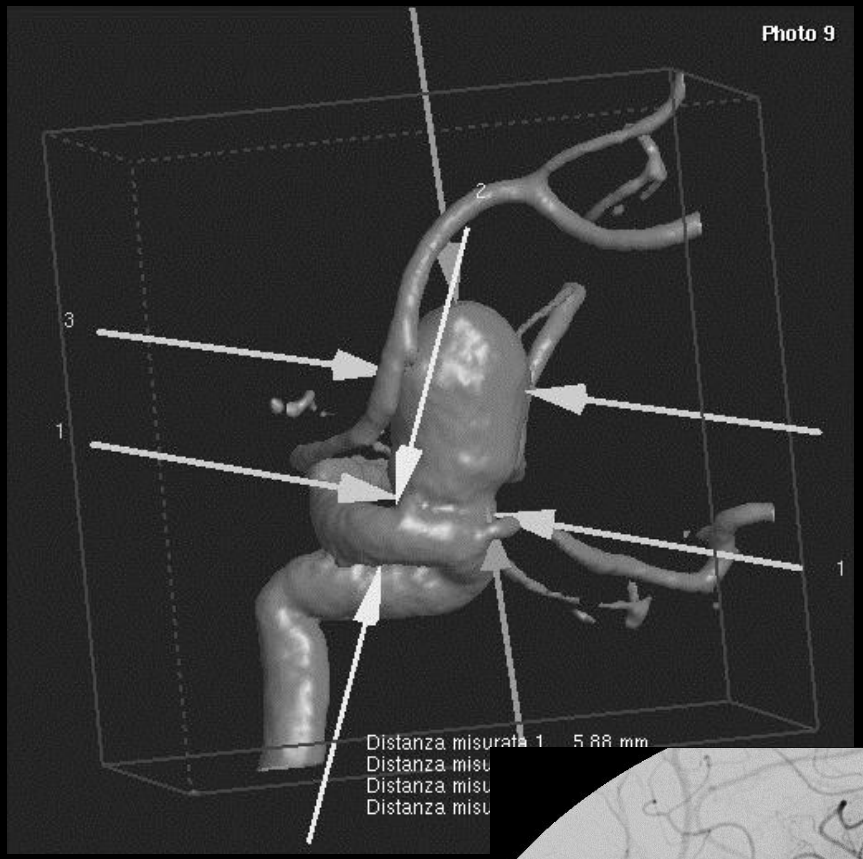
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3
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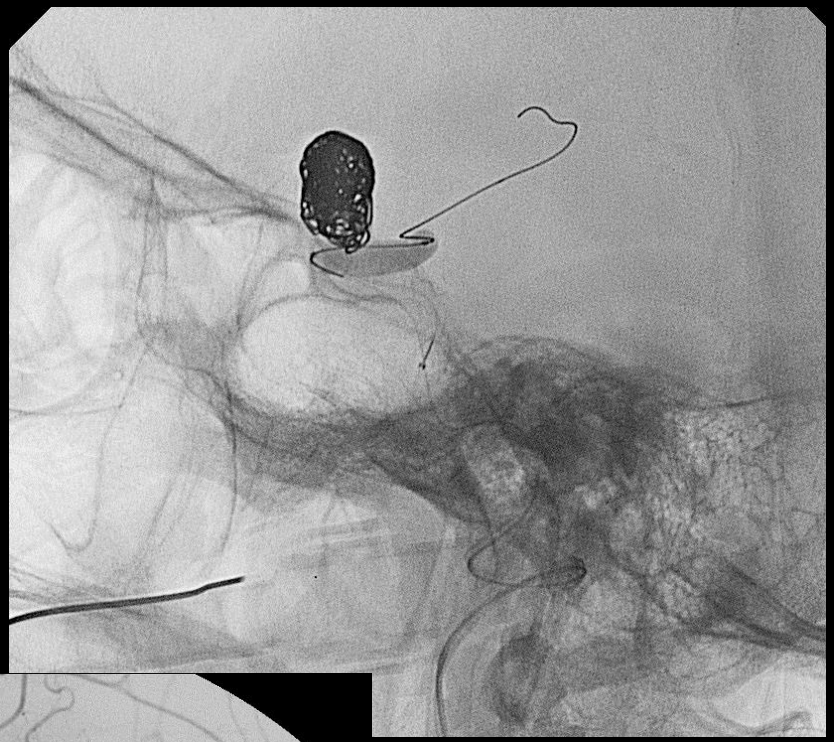
Distanza misu
Distanza misu
Distanza misu



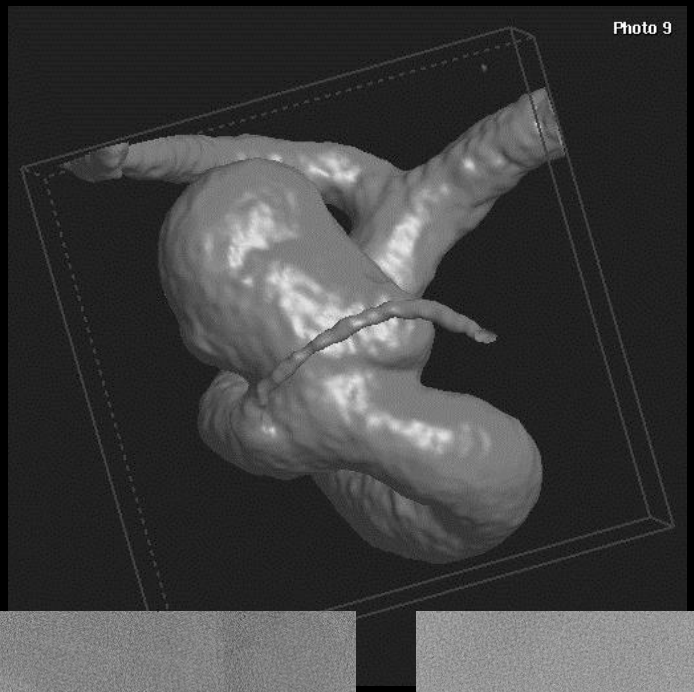
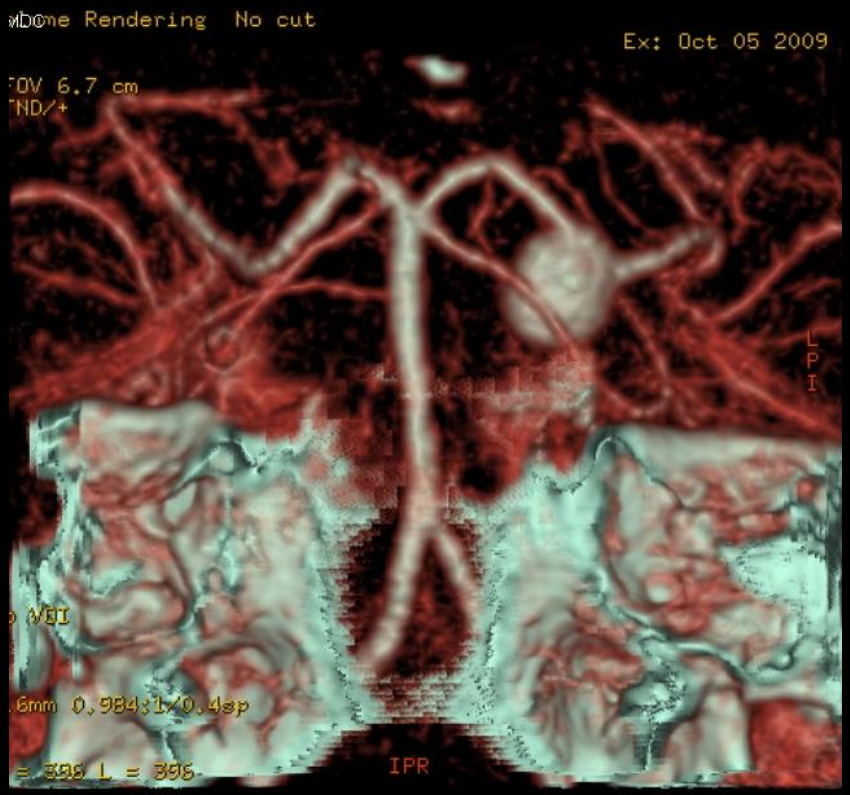


Photo 9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Ex: Oct 05 2009
FOV 6.7 cm
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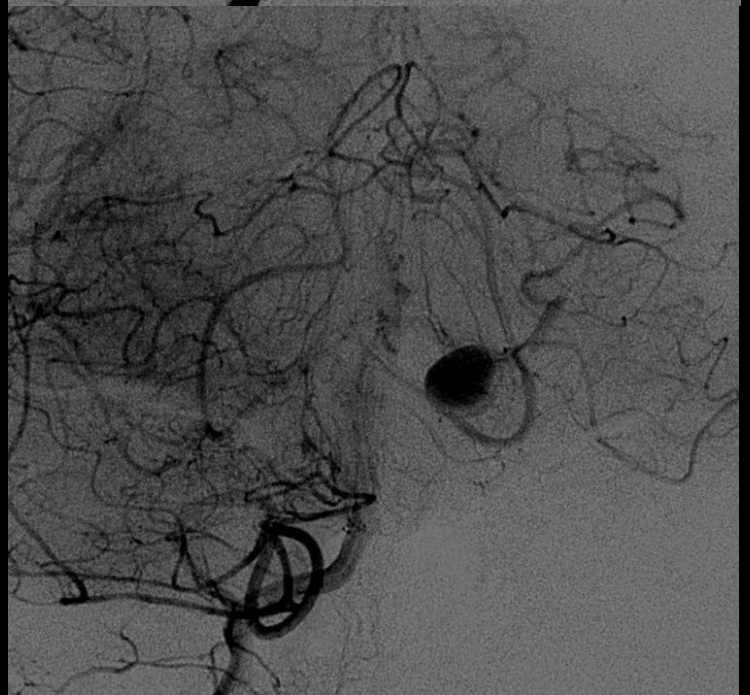
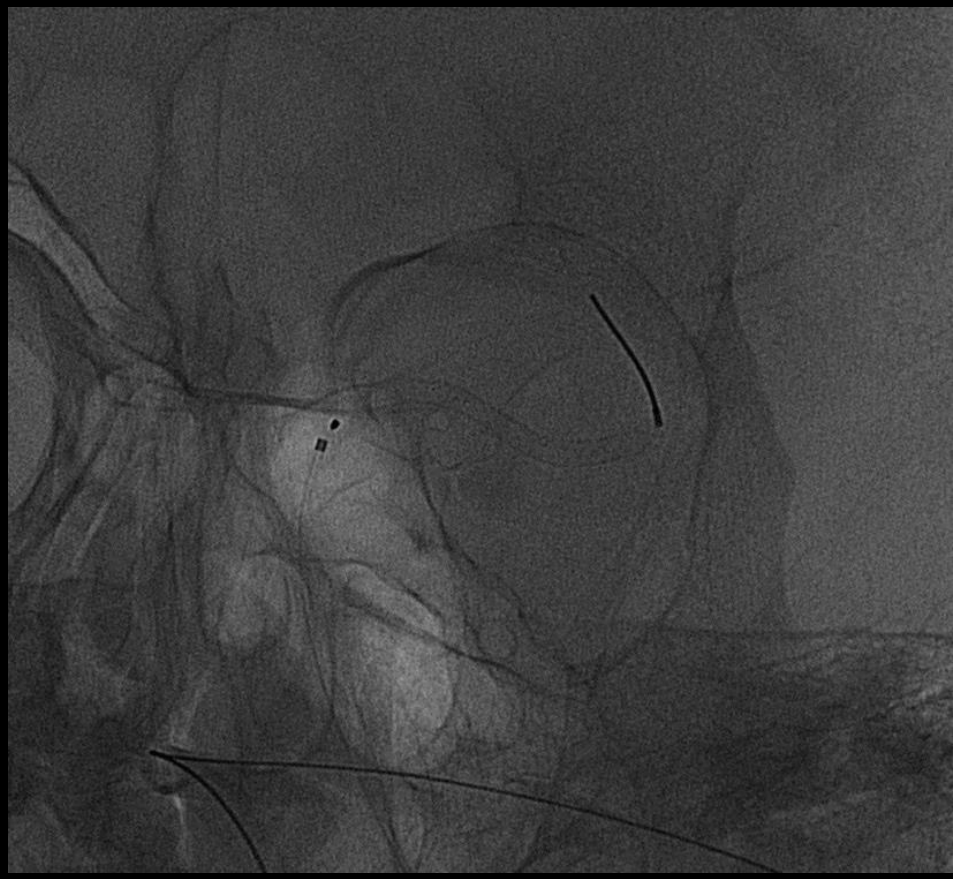
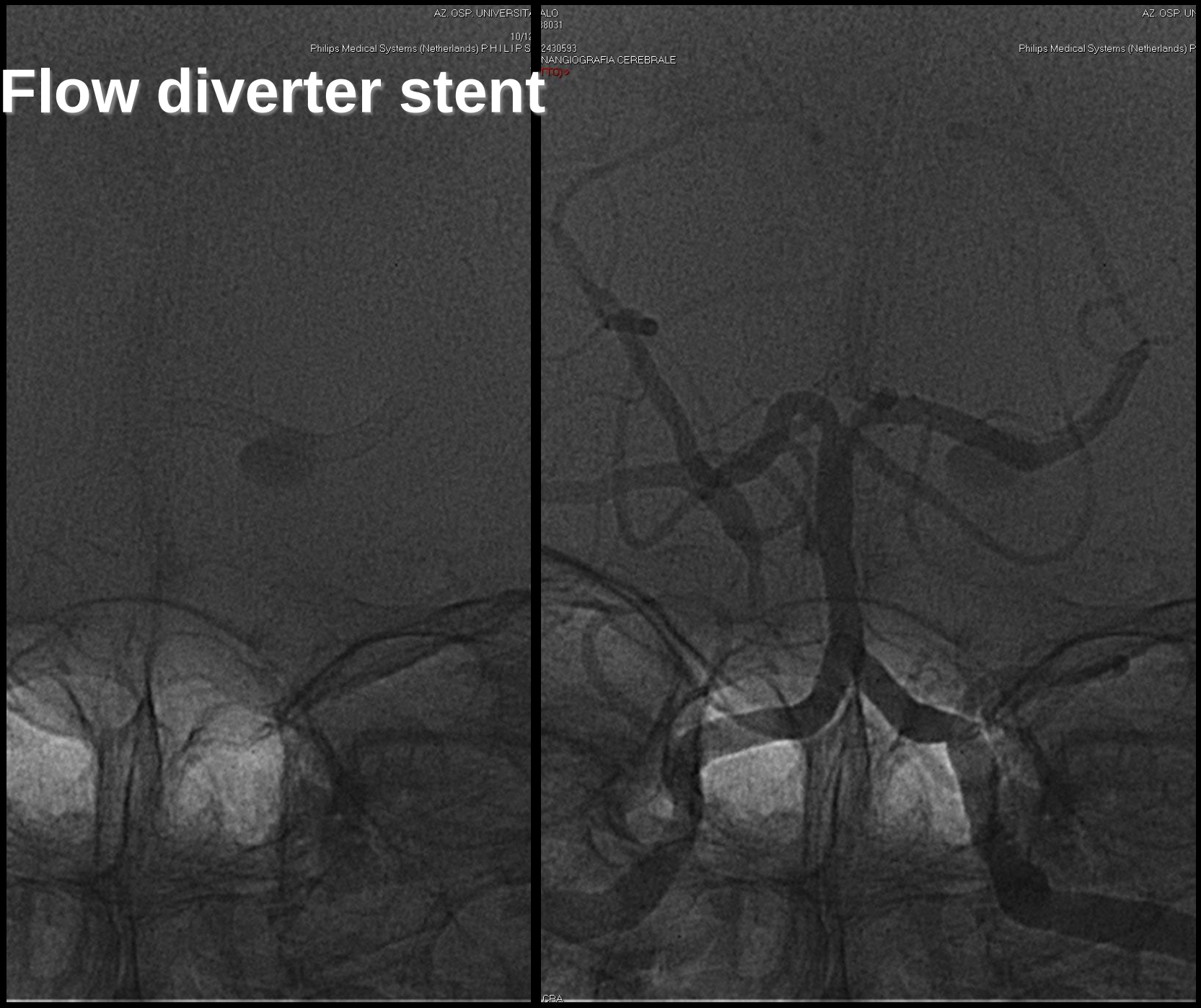
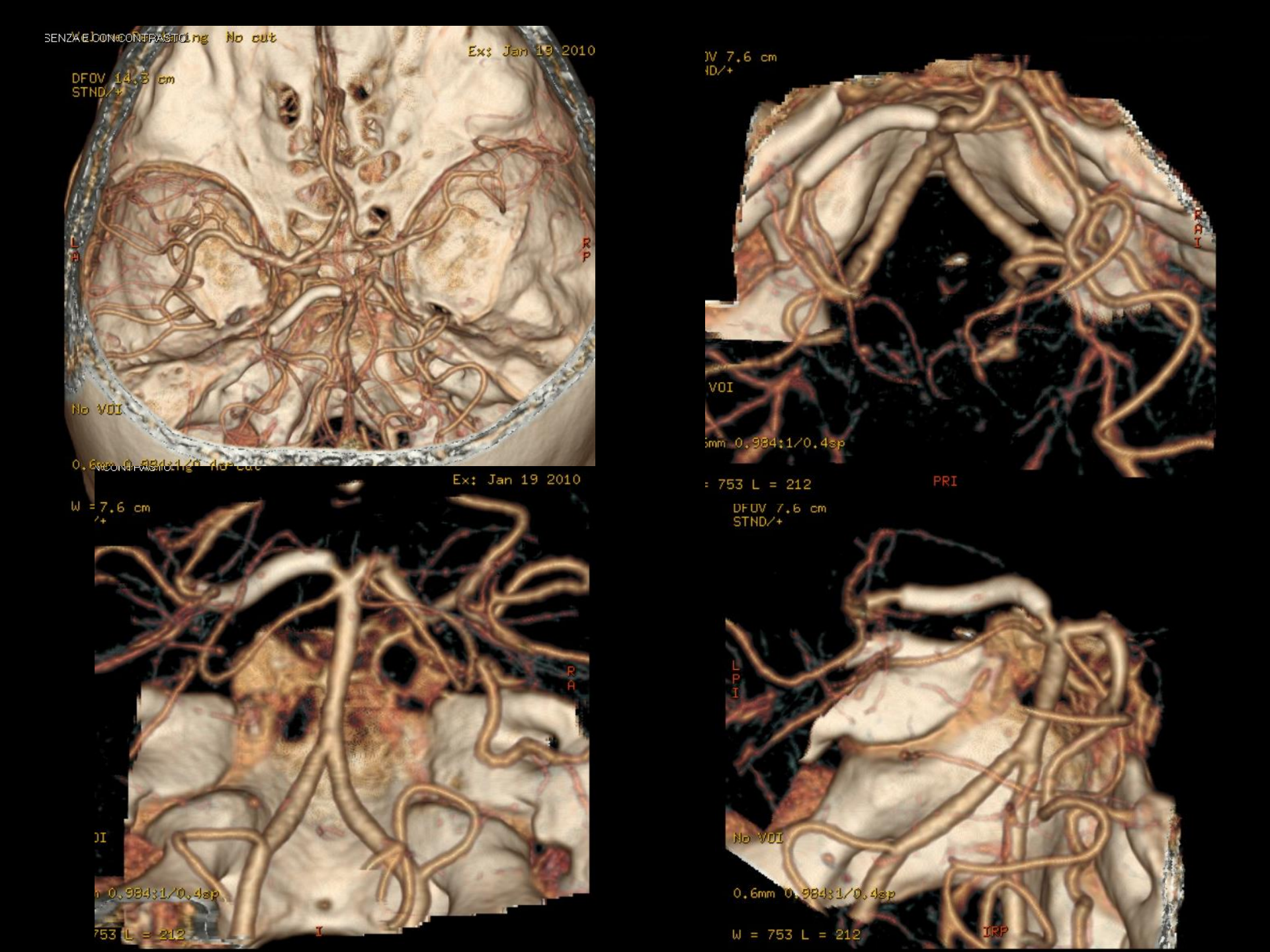
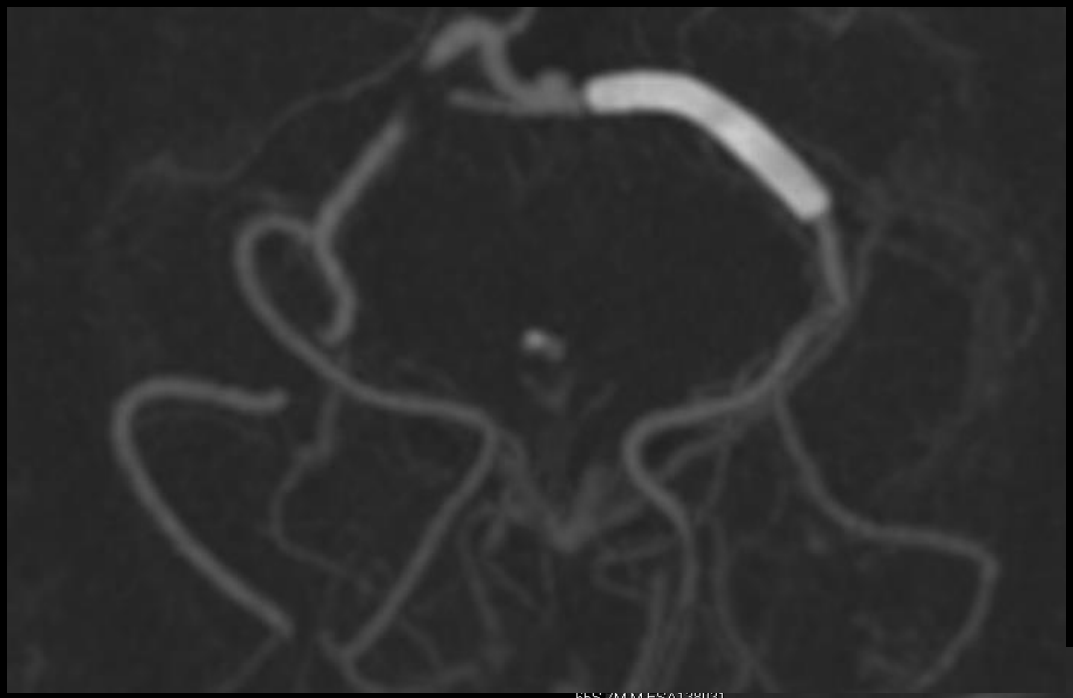


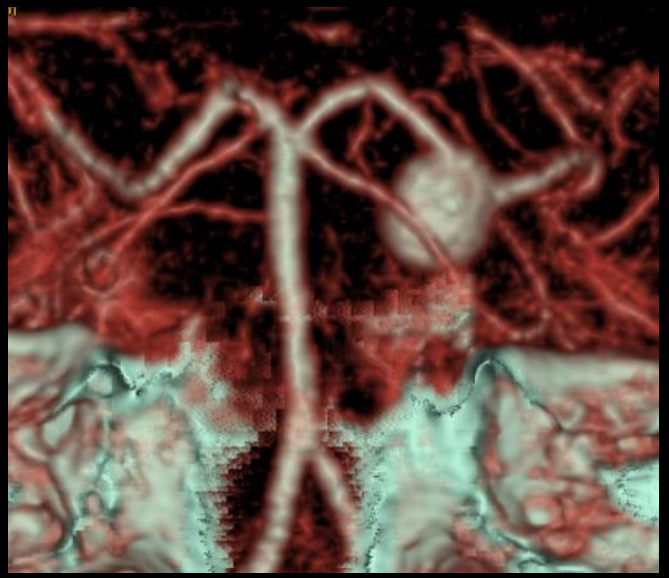


Flow diverter stent




SENZA E CON CONTRASTO
ng No cut
Ex: Jan 19 2010
DFOV 14.3 cm
STND/+
L
A
RP
No VOI
0.6mm 0.984:1/0.4sp No cut
CONTRASTO
Ex: Jan 19 2010
W = 7.6 cm
/+
RA
753 L = 212
I
)V 7.6 cm
ND/+
RAI
VOI
mm 0.984:1/0.4sp
: 753 L = 212
PRI
DFOV 7.6 cm
STND/+
LPI
No VOI
0.6mm 0.984:1/0.4sp
W = 753 L = 212
IRP





OSPEDALE S.ANNA FERRARA
19/01/2010 ,17.47.01
GE MEDICAL SYSTEMS LightSpeed VCT
tcne
120kV
SC:500,00 mm
LF 26,86 mm
217% Pixel

65S /M,M,FSA138031
N. richiesta: FSA2449261
Pos. paziente: HFS
Desc. studio: TC DELL'ENCEFALO SENZA E CON CONTRASTO
Desc. serie: Processed Images
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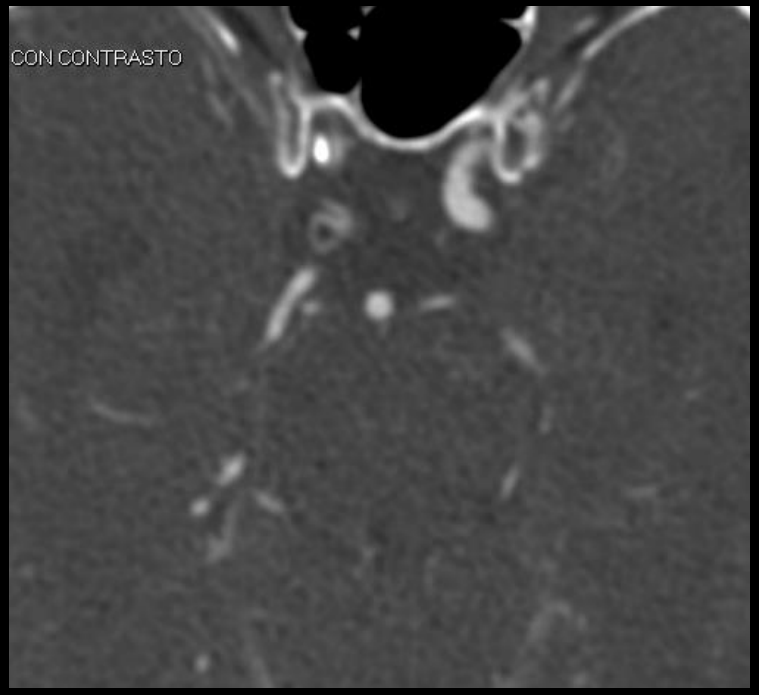
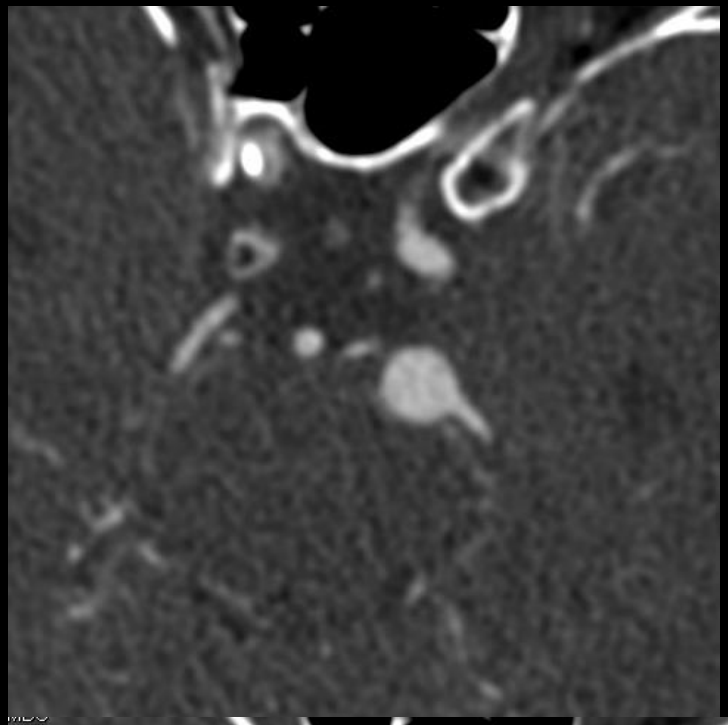
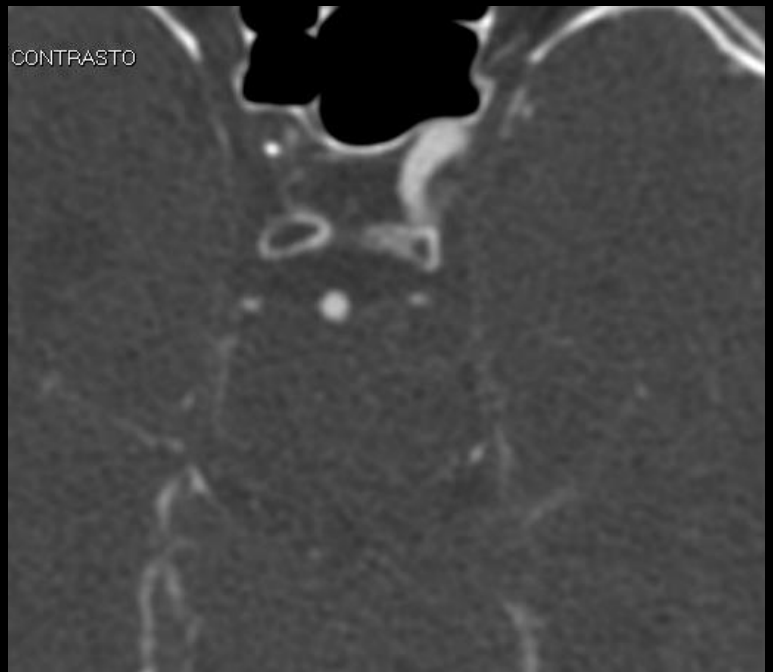
R

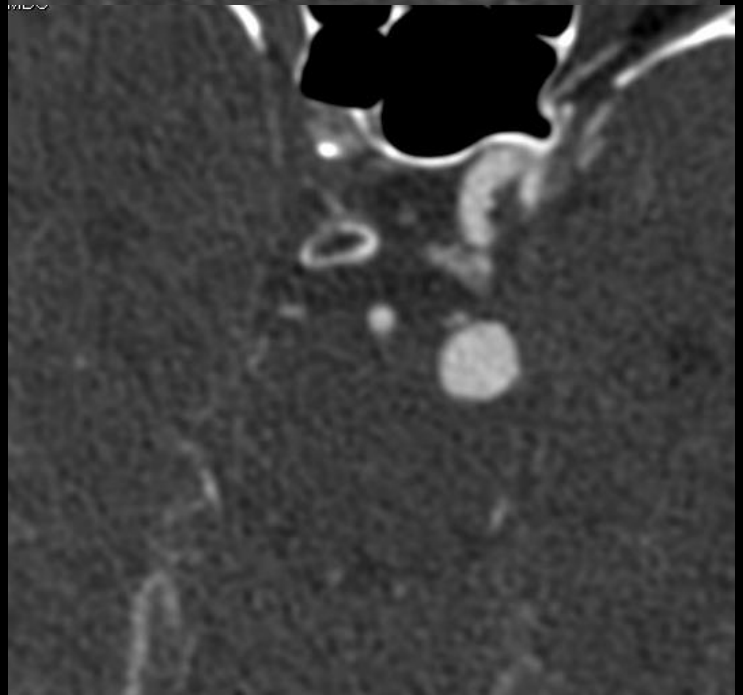
1 cm

C 68
W 178


CON CONTRASTO




CONTRASTO



ICTUS ISCHEMICO

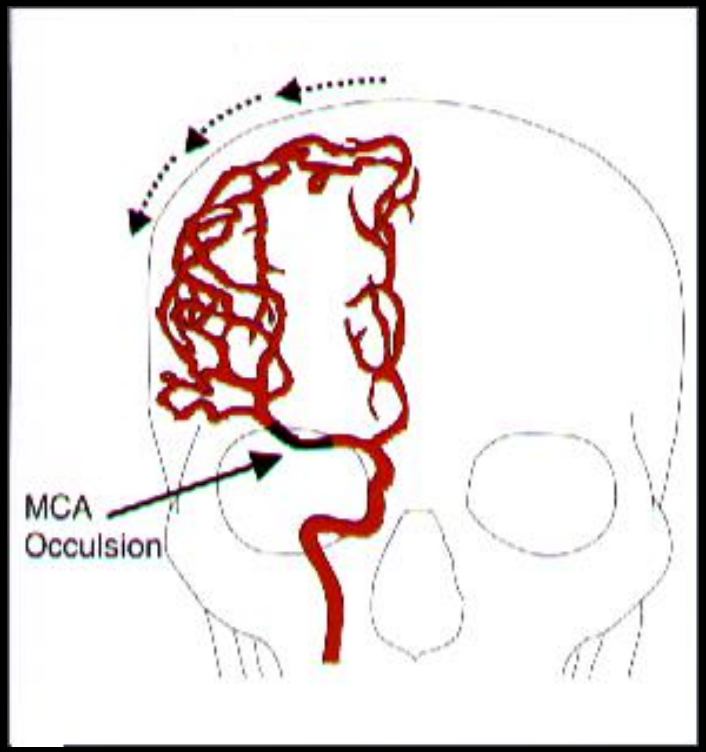
ICTUS ISCHEMICO

In Italia 10-12% di tutti i decessi/anno
3° causa di morte dopo le malattie cardiovascolari e neoplasie
Negli ultimi anni incidenza media 2.5/100.000 abitanti
10% muore entro i primi 30 gg
50% dei sopravvissuti destinato alla disabilità

L'ISCHEMIA CEREBRALE

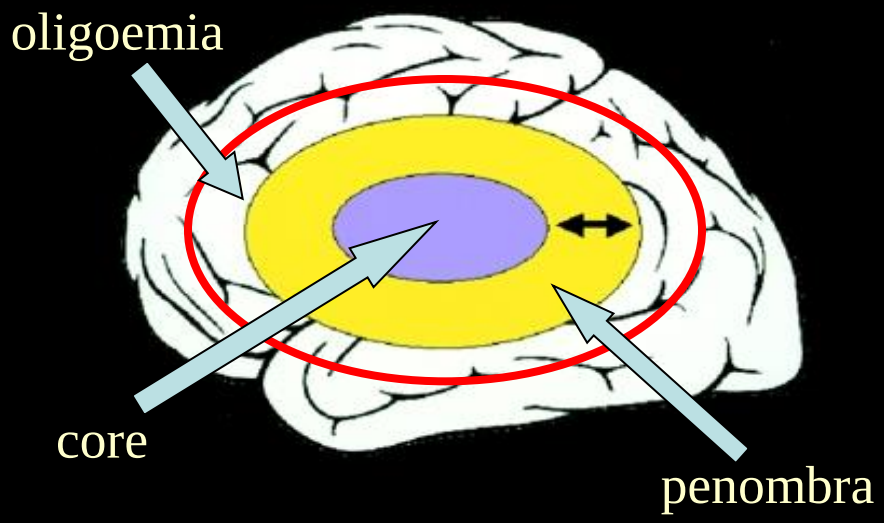
L'ischemia cerebrale è una condizione fisiopatologica determinata da una riduzione del flusso ematico cerebrale o ipoperfusione a livello di una zona di tessuto nervoso

L'ISCHEMIA CEREBRALE



La ridotta perfusione è prodotta dall'occlusione di un'arteria cerebrale da parte di un coagulo che si forma in sede (trombo) o da un frammento di trombo proveniente da un altro vaso (embolo) che causa l'arresto o la riduzione del flusso ematico cerebrale in corrispondenza del rispettivo territorio di irrorazione

L'AREA ISCHEMICA



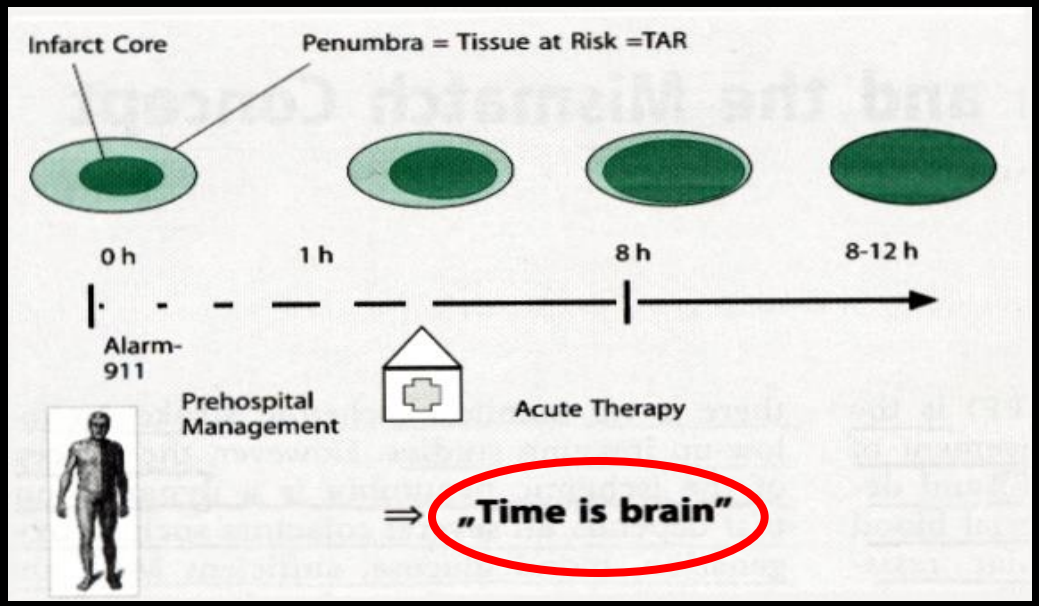
Nel contesto di un'area ischemica si distinguono tre zone differenti:

1) una zona centrale, il core ischemico

2) una zona periferica, la penombra ischemica

3) una zona perilesionale disposta attorno all'area di penombra, l'oligoemia benigna

LA PENOMBRA ISCHEMICA



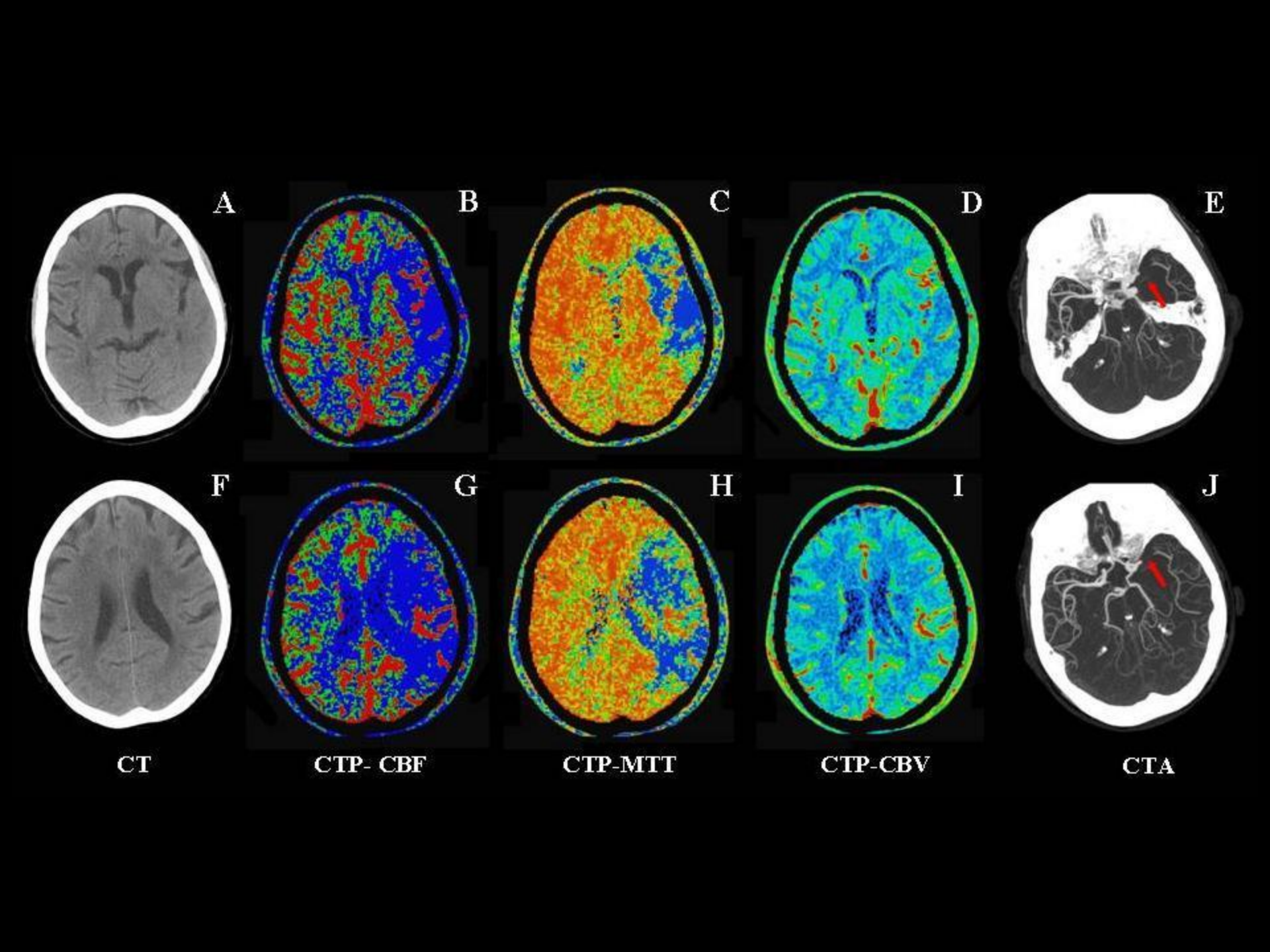
Se la riperfusione non si realizza, la penombra ischemica evolve progressivamente verso l'infarto dopo circa 8-10 ore ("time is brain")

penombra → 10-20 ml/100gr/min → infarto

no riperfusione

TERAPIA

- **Trombolisi sistemica entro 4.5 ore**
- **Trombolisi loco regionale entro 6 ore**
- **Trombolisi meccanica entro 8-9 ore se penombra**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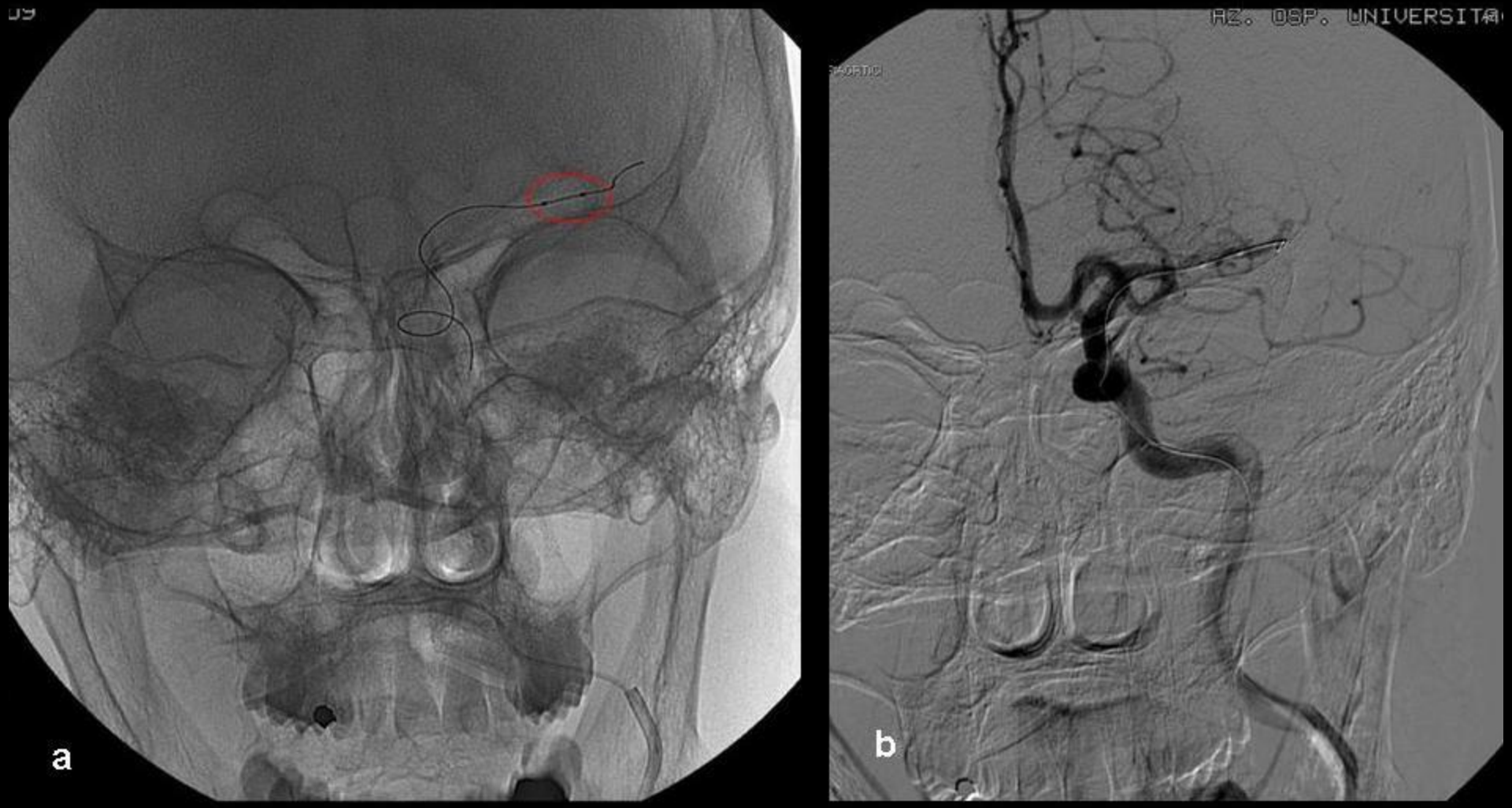
CTP- CBF
CTP-MTT
CTP-CBV
CTA


a
b


AZ. OSP. UNIVERSITA
a
b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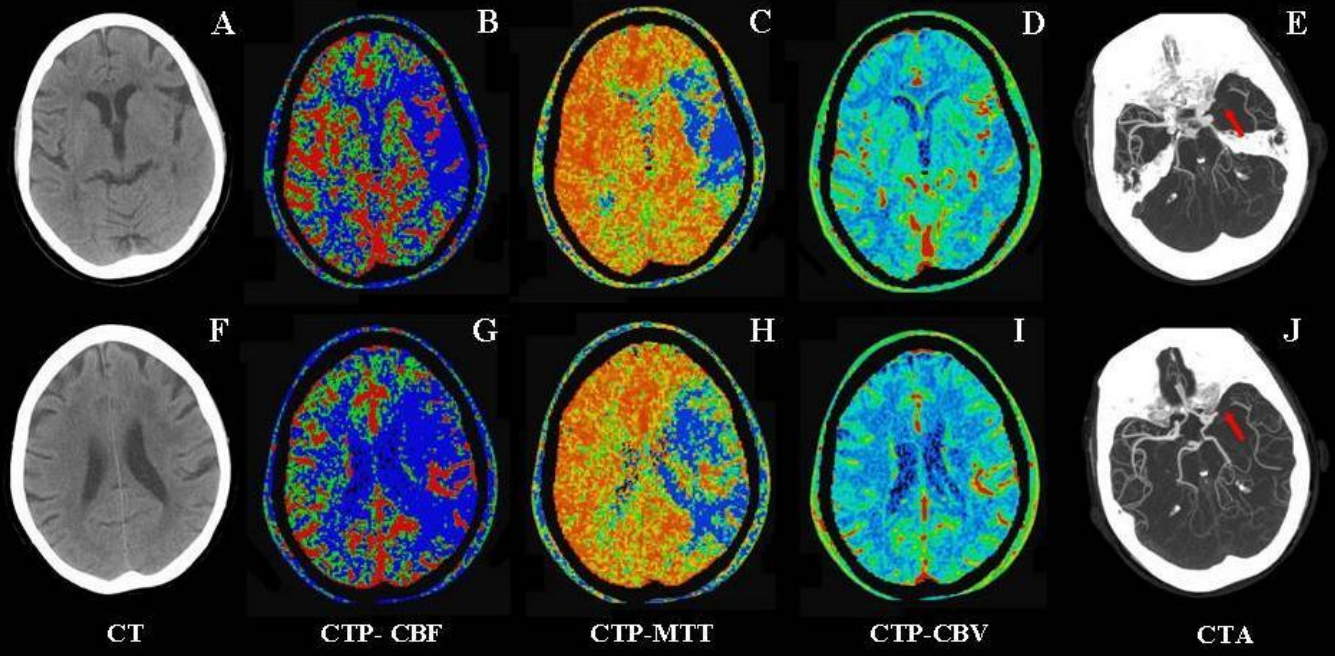
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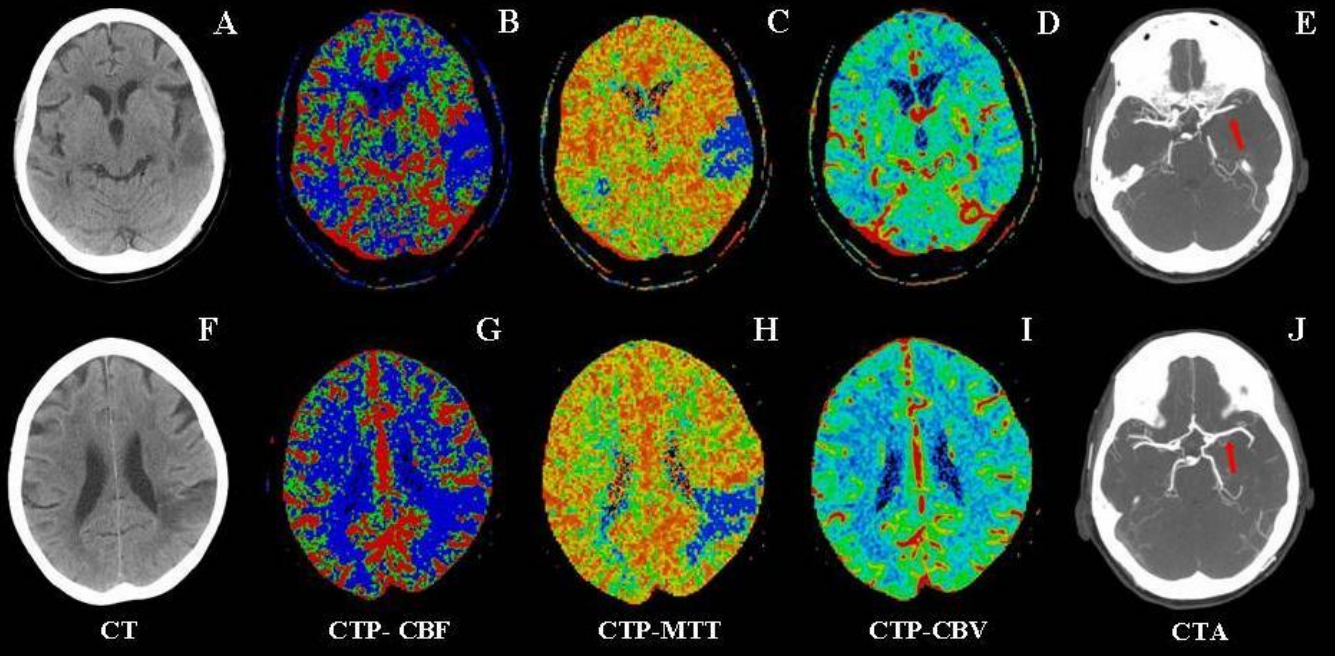
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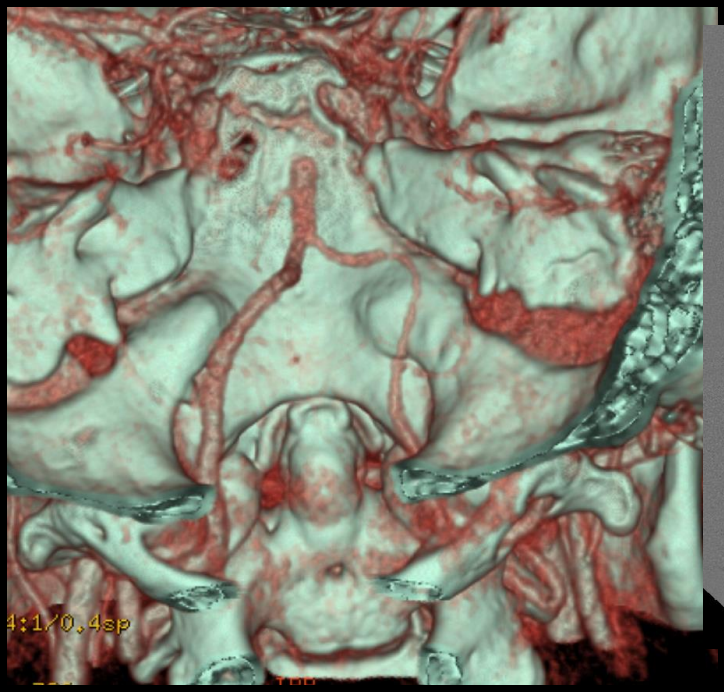
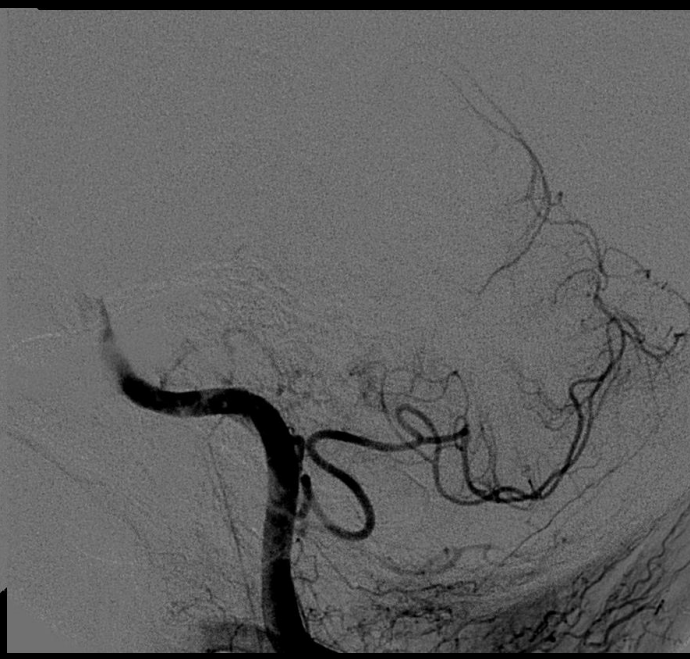
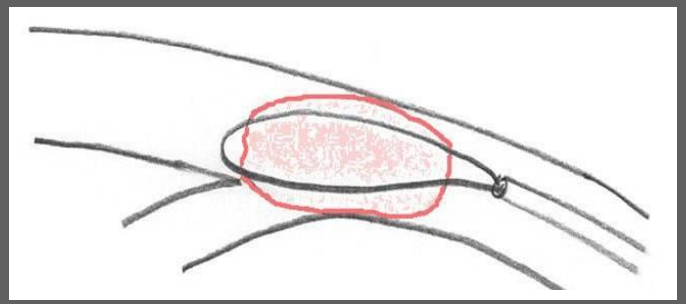

4:1/0.4sp

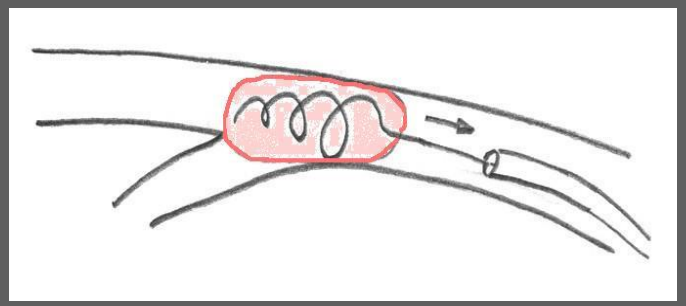


Sistemi disponibili



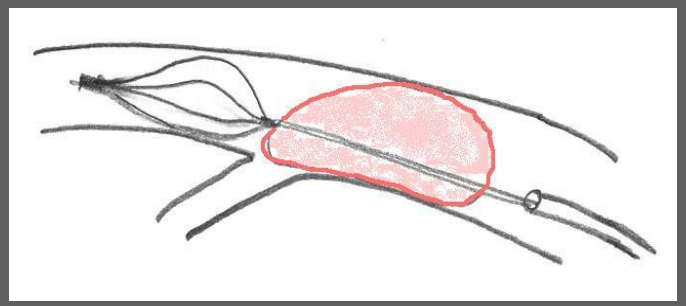
LASSOO (BALT Extrusion, Boston Sc., …)

- **Inizialmente disegnato per recupero delle spirali**



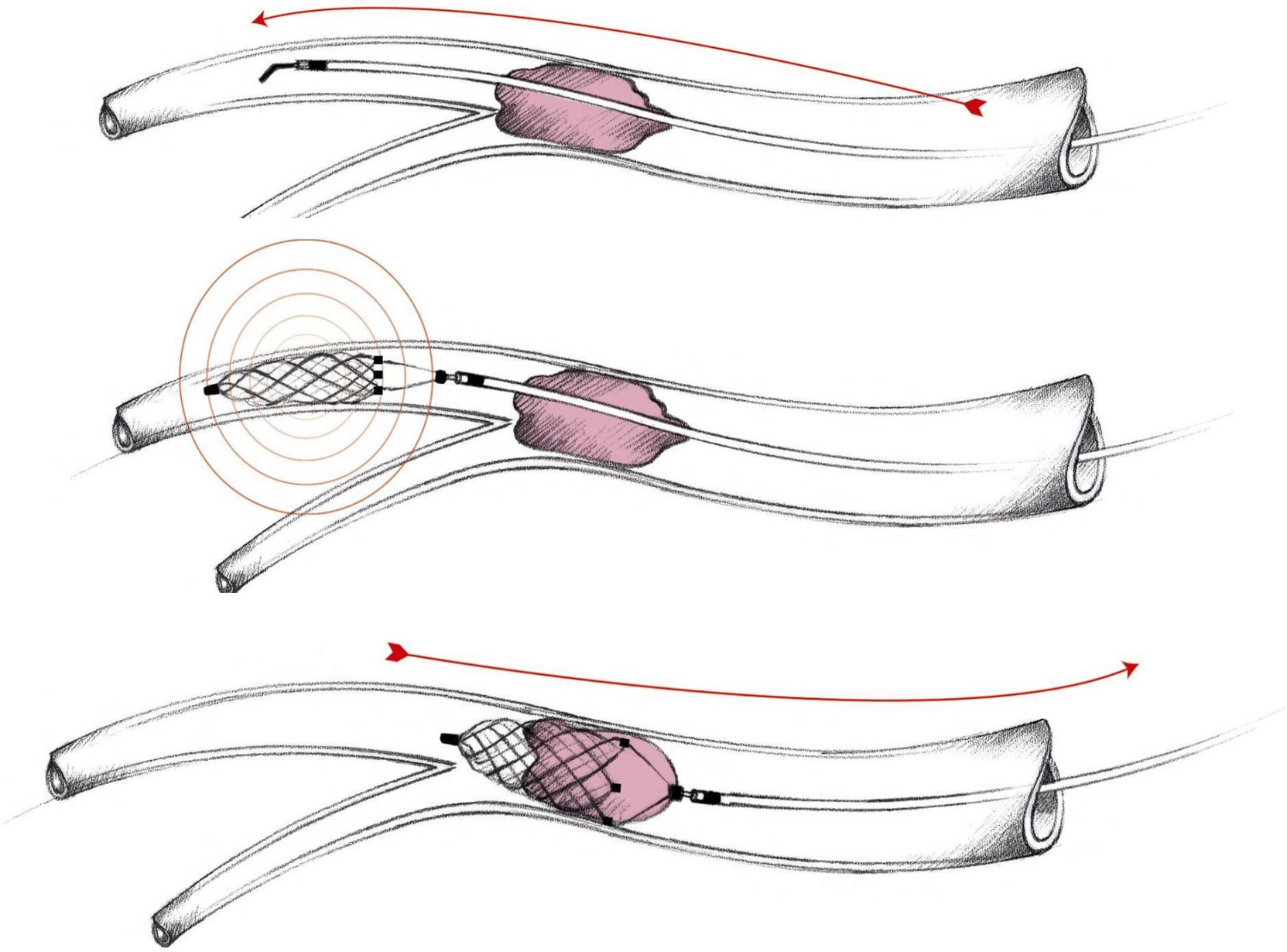
MERCI™ (Concentric Medical)

- **« Cavatappi »**
- **50% successo**

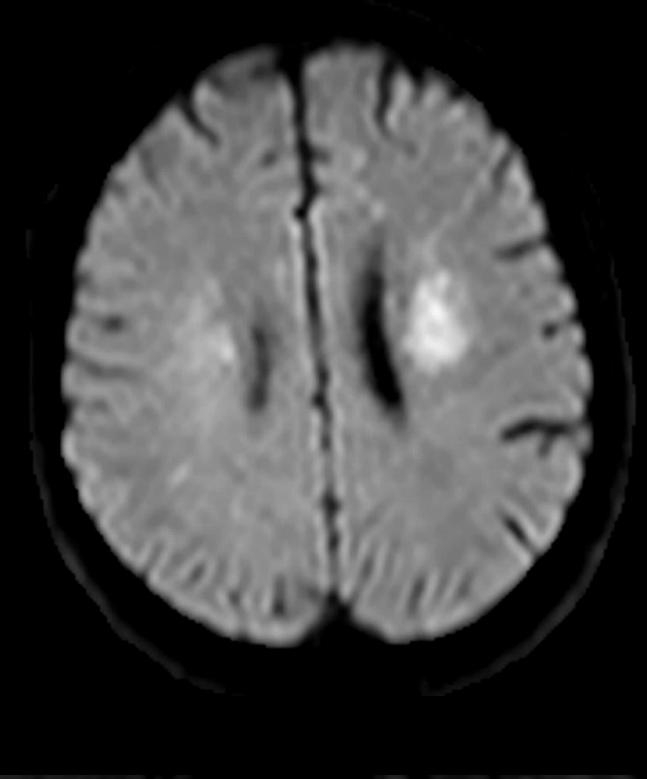


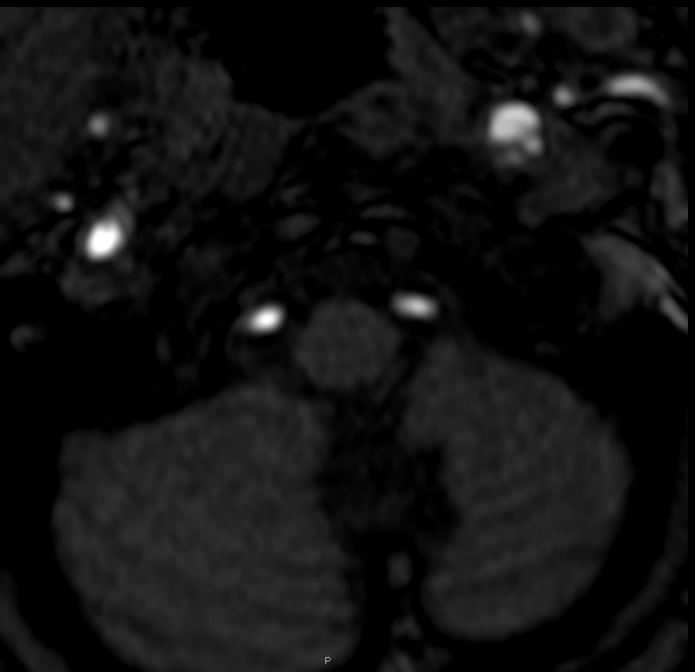
IN-TIME™ (Boston Scientific)

- **Dormia system**
- **Troppo rigido per uso intracranico**

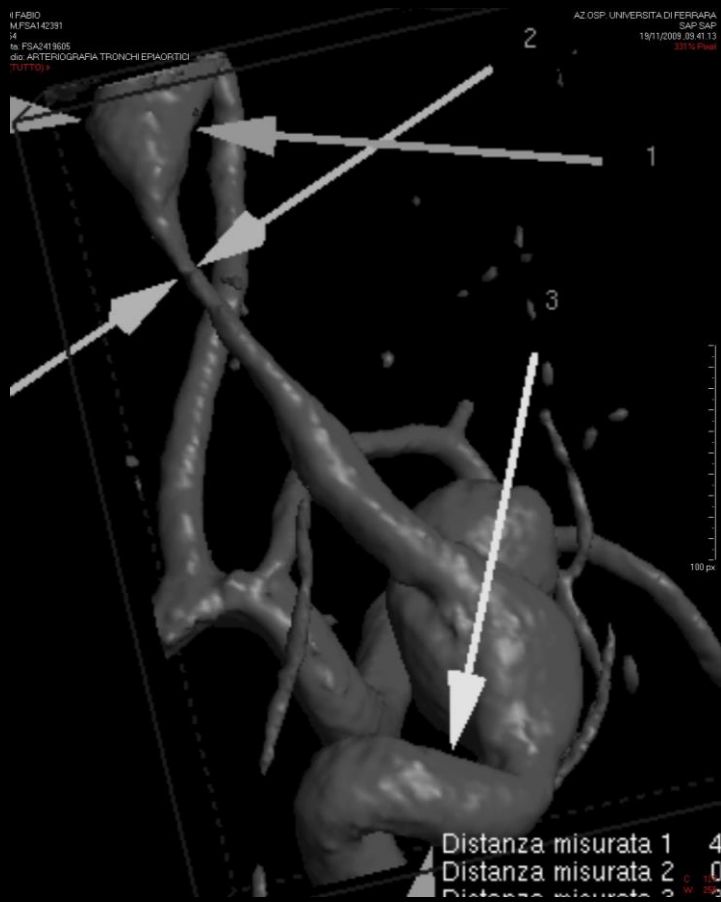


STENTING CAROTIDEO






Philips M


AZ.OSP. UNIVERSITA DI FERRARA
SAP SAP
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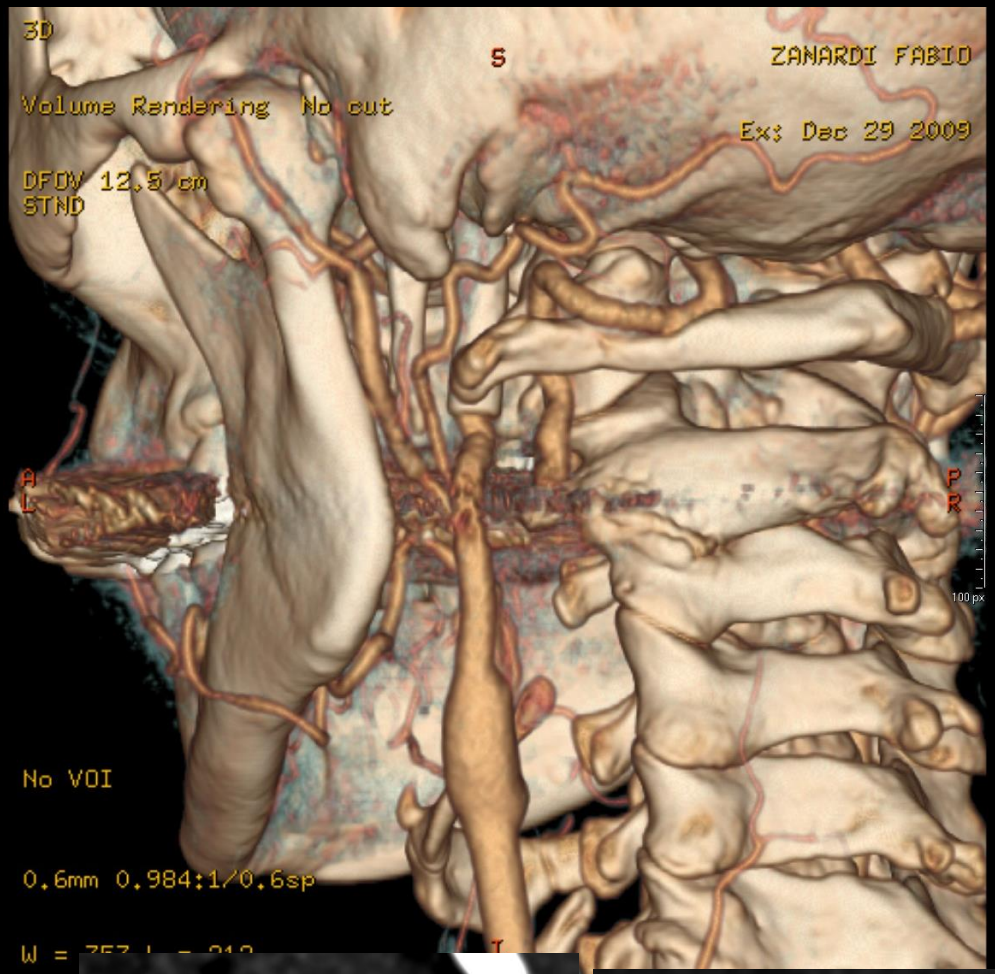
Distanza misurata 1
Distanza misurata 2

Dissezioni


Philips Medical Sy
EPIAORTICI
Philips Medical Sy6128
RIOGRAFIA SELETT. TRONCHI EPIAORTICI
Precise 5mmx40mm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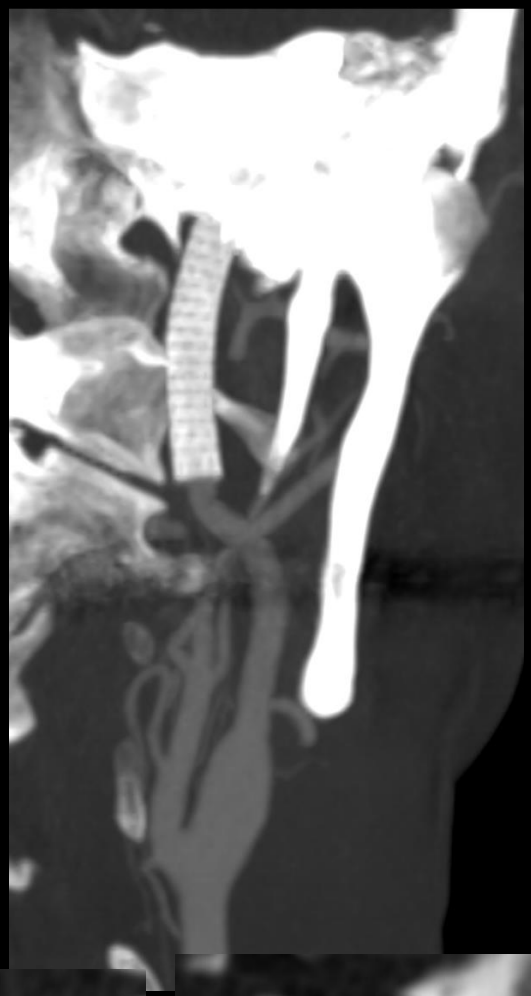


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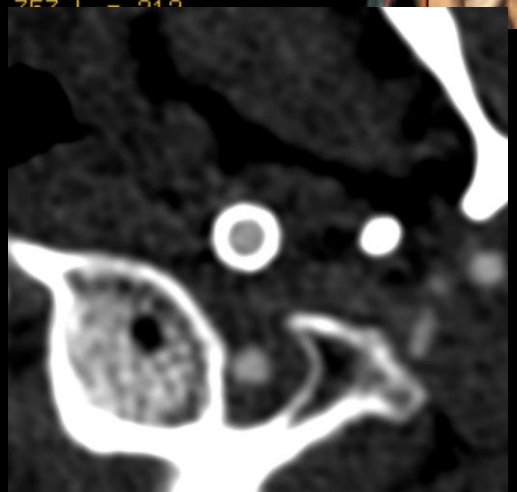
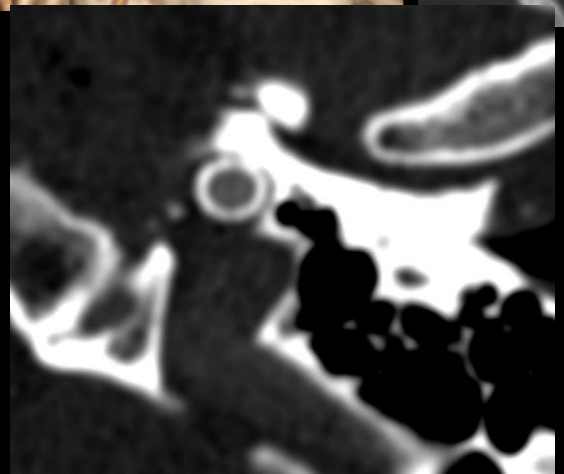
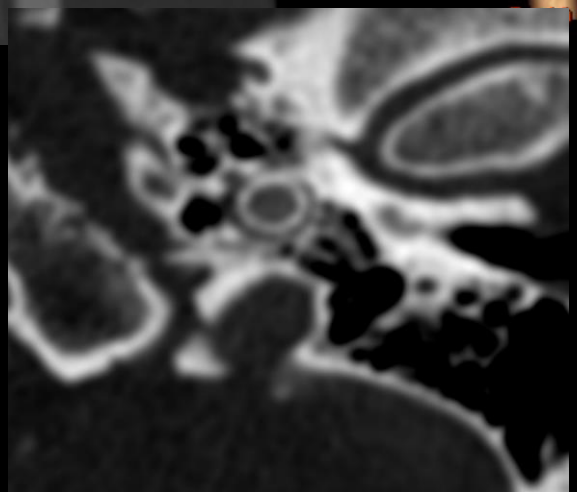




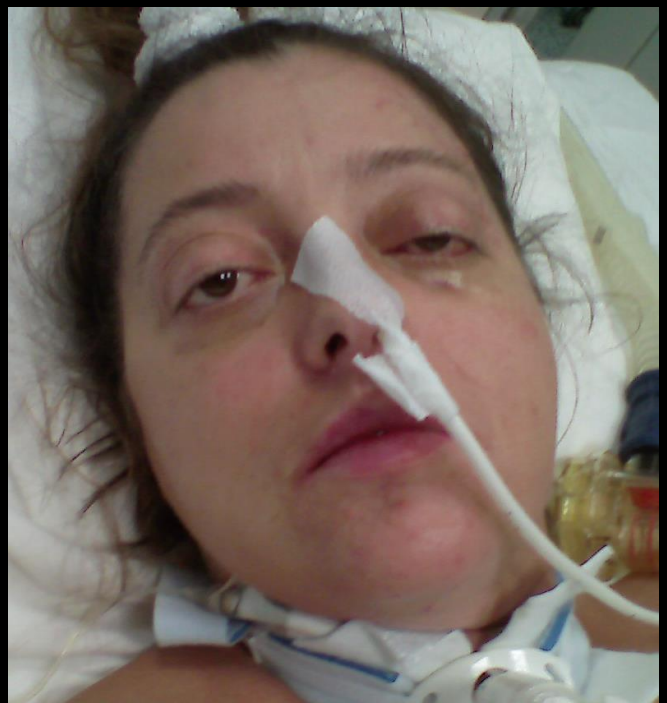


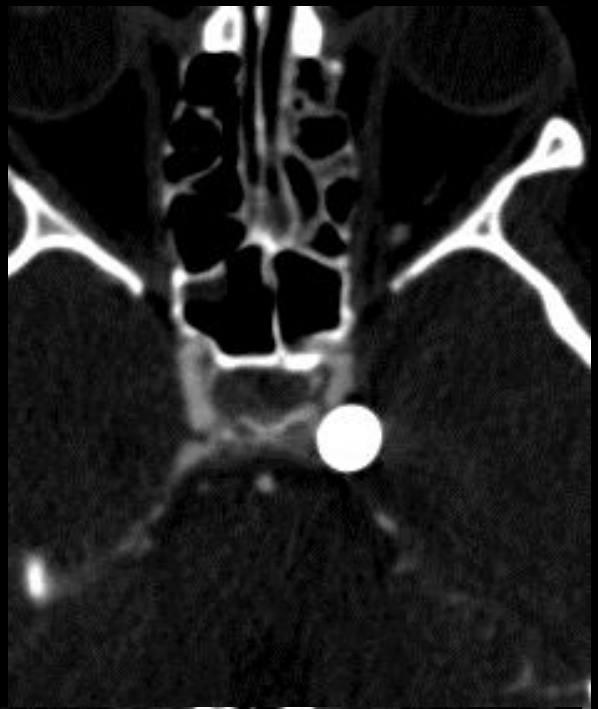
Stenosi carotidea

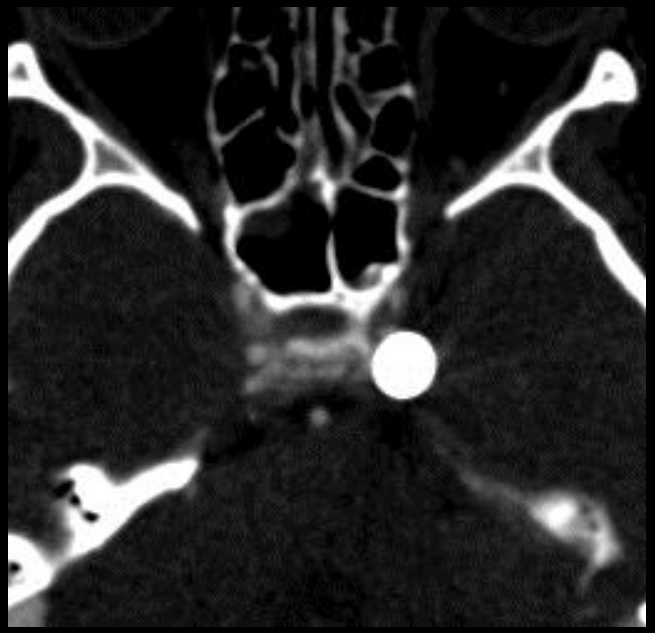
FISTOLA CAROTIDO CAVERNOSA

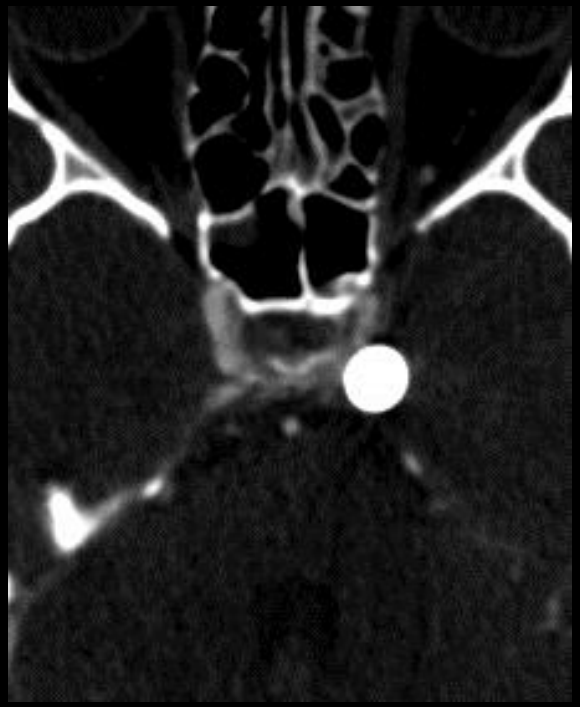
NEURORAD


ALBA
URORA
NTROLL



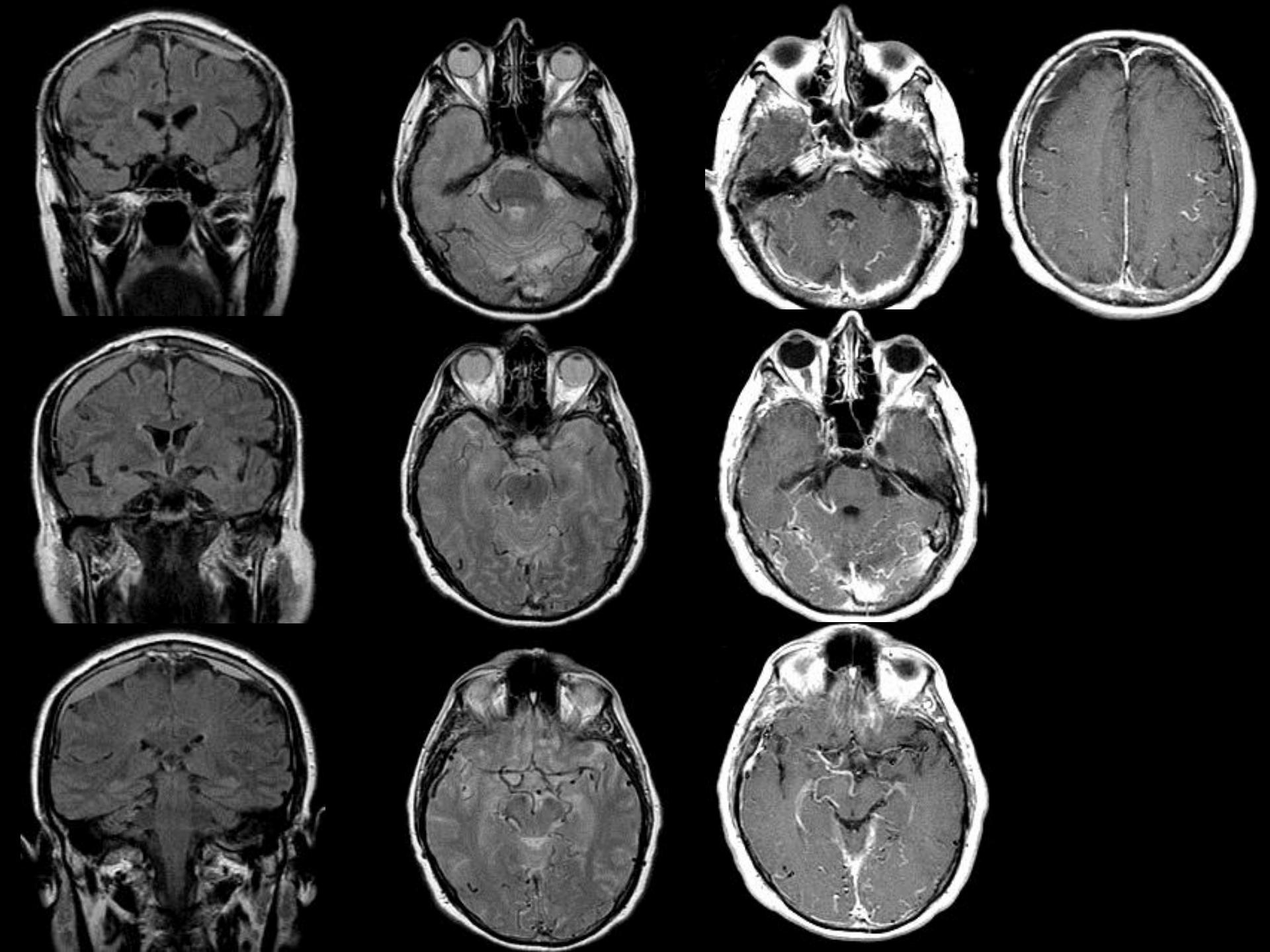


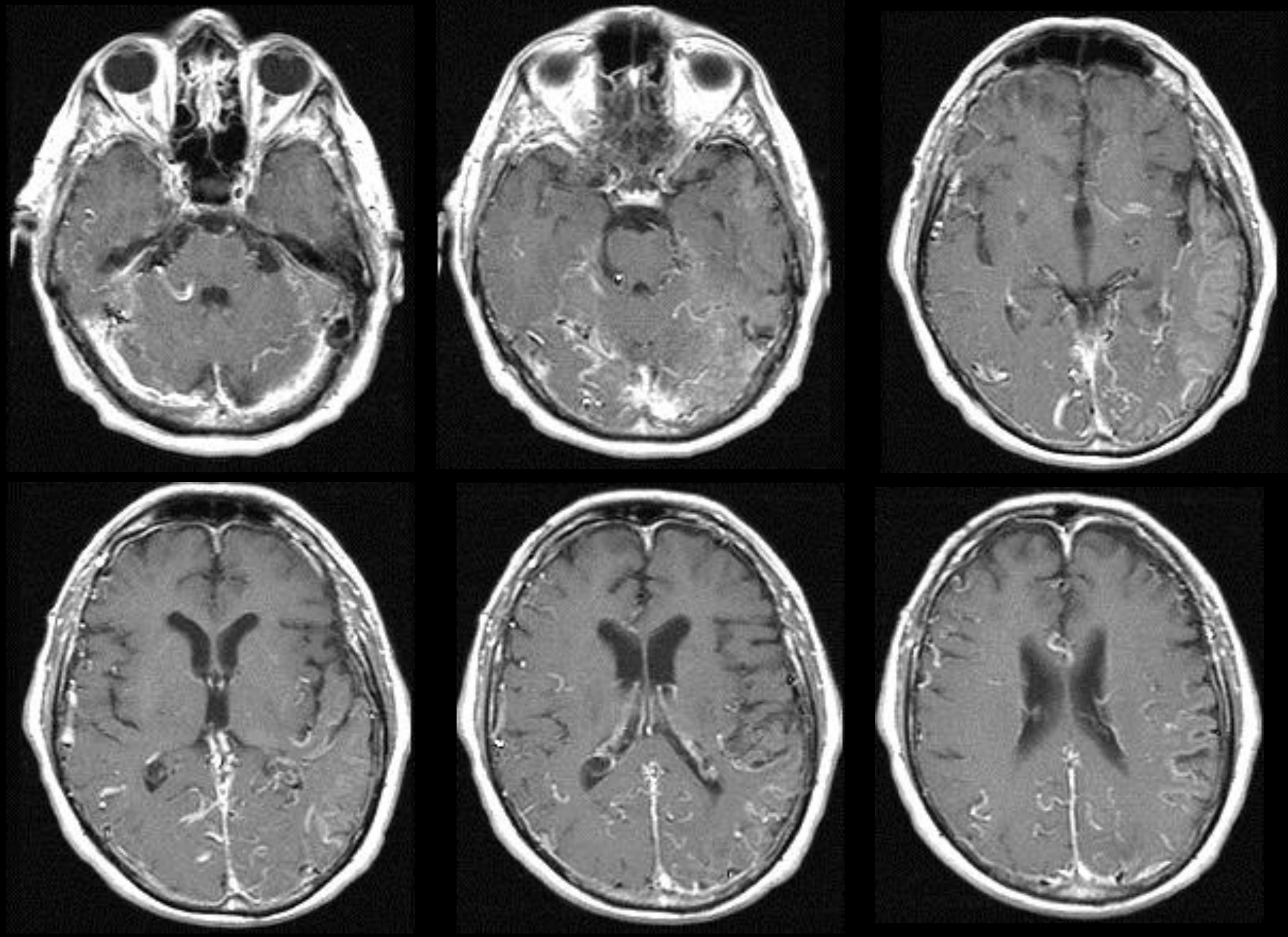


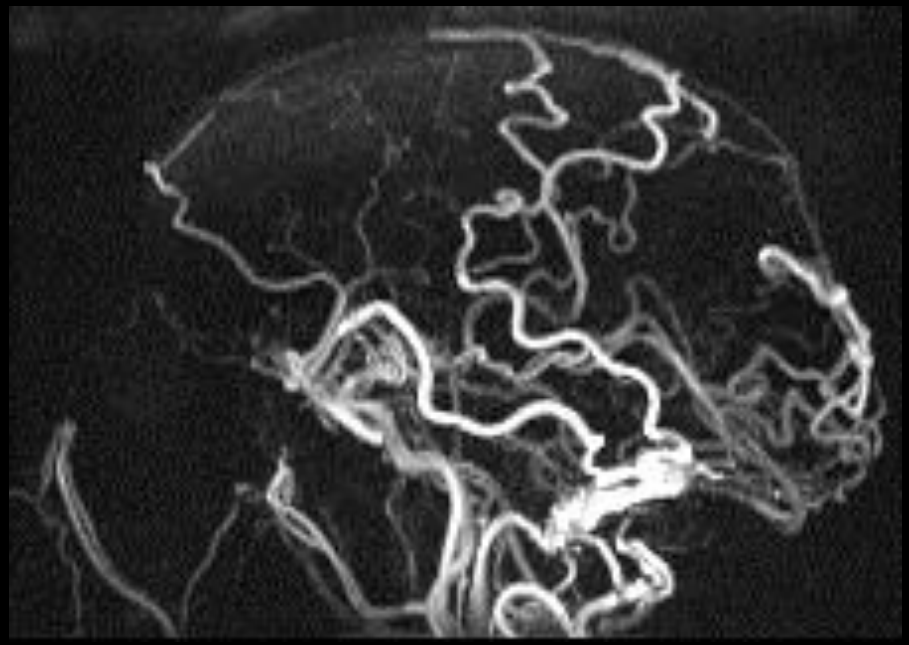


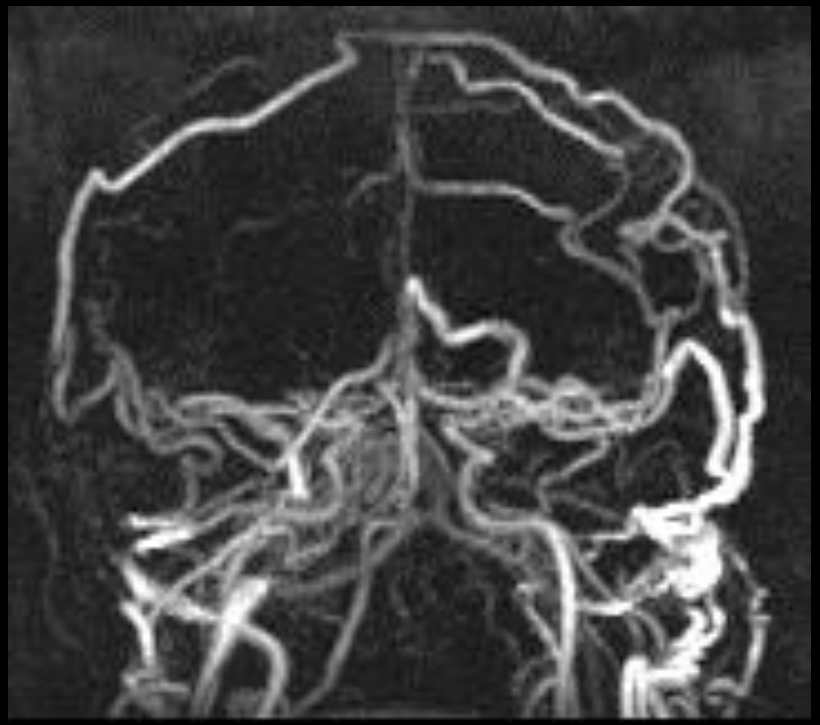
FISTOLA DURALE

C.M Maschio 61 aa
16/5/06 P.S: Trauma cranico senza perdita di coscienza GCS 14. Cefalea
TC cerebrale urgente:frattura occipitale paramediana sn ematoma contusivo intraparenchimale
Dimissione
19/6/06 P.S: Riferita disartria e stato confusionale
Non deficit neurologici focali
TC cerebrale urgente: falda ipodensa frontale dx
RM cerebrale: trombosi seni venosi
Dimissione
9/10/06 P.S: Stato di coma
TC cerebrale urgente:falda ipodensa con segni di Sanguinamento più recente.Dimissione
16/1/07 P.S: Epilettico in pregressa trombosi venosa Seni durali, ematoma sottodurale cronico in terapia con Coumadin. Trauma cranico accidentale. Disartria. Clonie facciali.TC (negativa), RM, AGF







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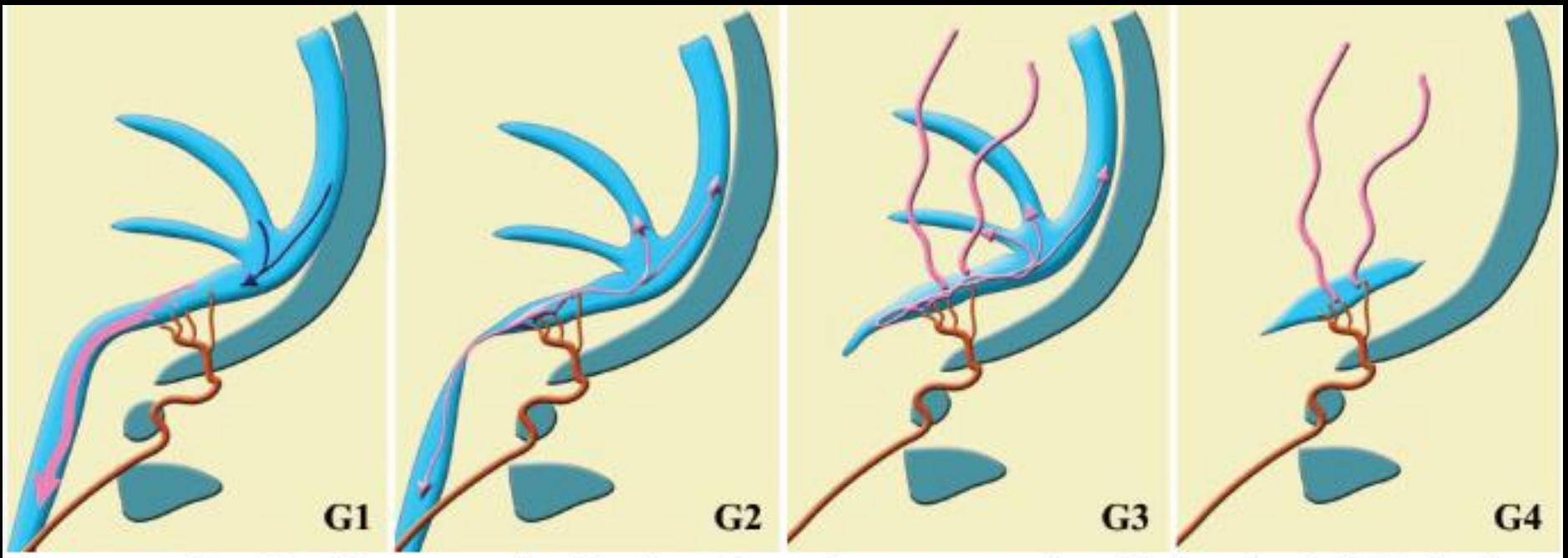
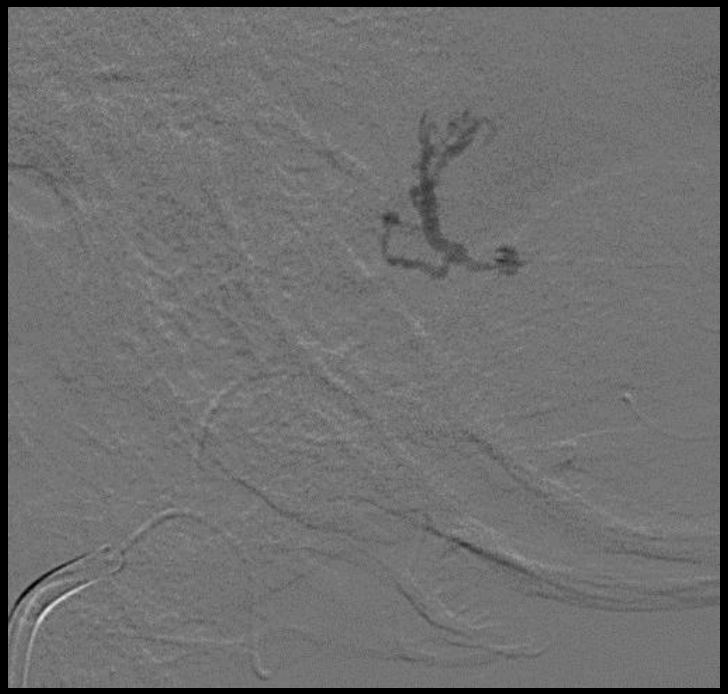
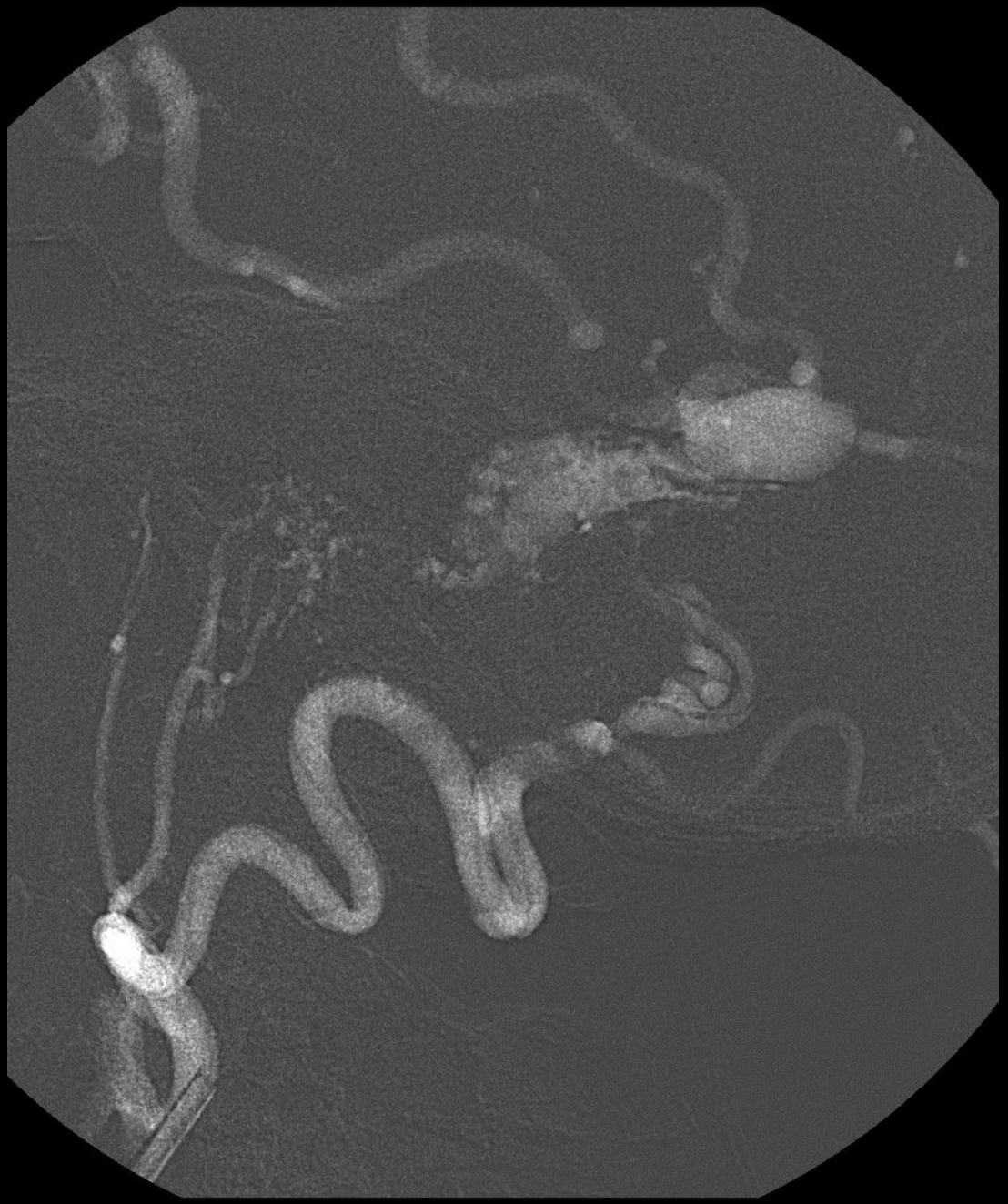


Figure 8. Drawings illustrate a classification scheme for transverse-sigmoid sinus dural AVFs that is based on venous drainage patterns: Grade 1, antegrade sinus drainage without venous restriction or cortical venous reflux; Grade 2, antegrade and retrograde sinus drainage with or without cortical venous reflux; Grade 3, retrograde sinus drainage with cortical venous reflux; and Grade 4, cortical venous reflux only. (Reprinted, with permission, from reference 11.)

Lalwani AK, Dowd CF, Halbach VV. Grading venous restrictive disease in patients with dural arteriovenous fistulas of the transverse/sigmoid sinus. J Neurosurg 1993; 79:11–15.





1 h 45 min di iniezione per un totale di 4ml di onyx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AZ. OSP. UNIVERSITA DI FERRARA
NEURORADIOLOGIA
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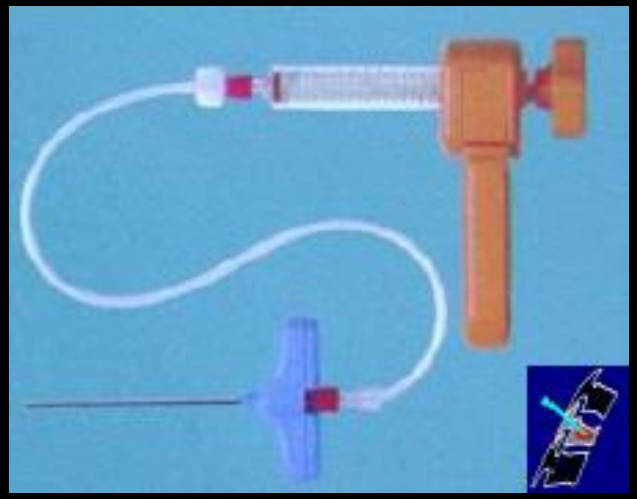
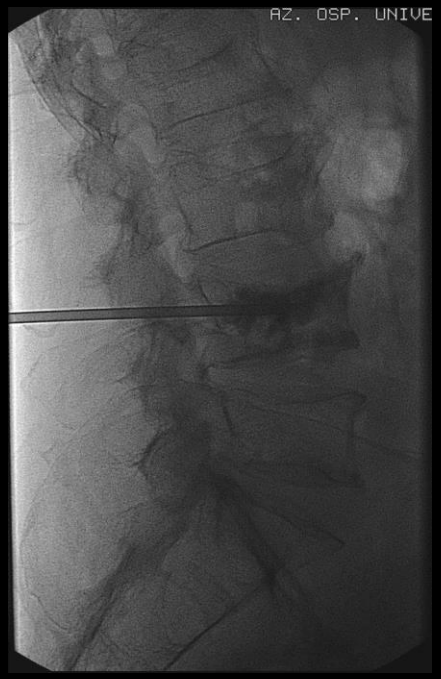
VERTEBROPLASTICA
BIOPSIE

INTRODUZIONE DELL'AGO
CON CONTROLLO FLUROSCOPICO

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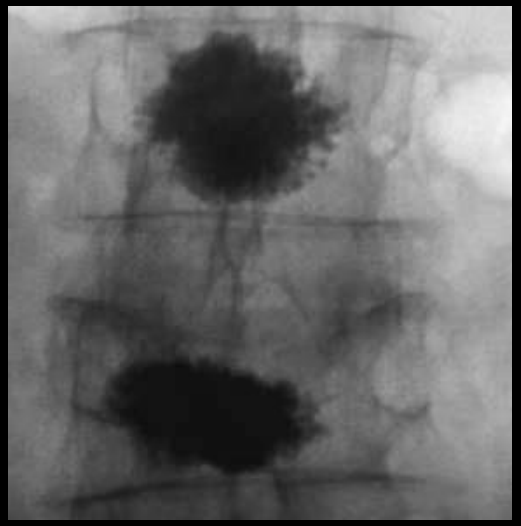
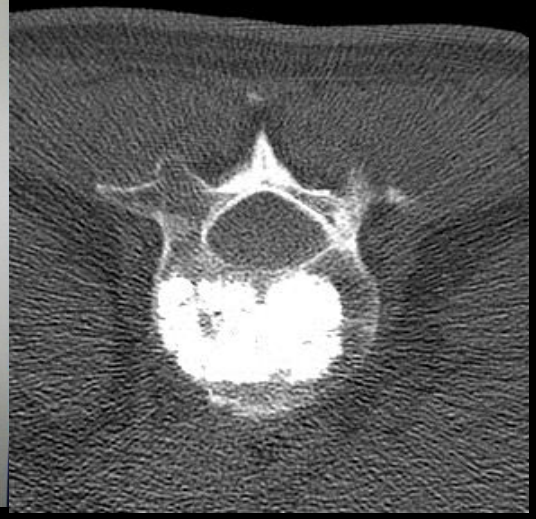
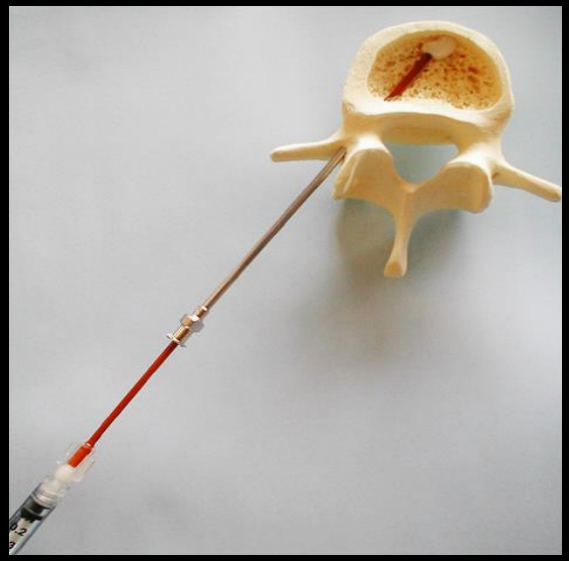
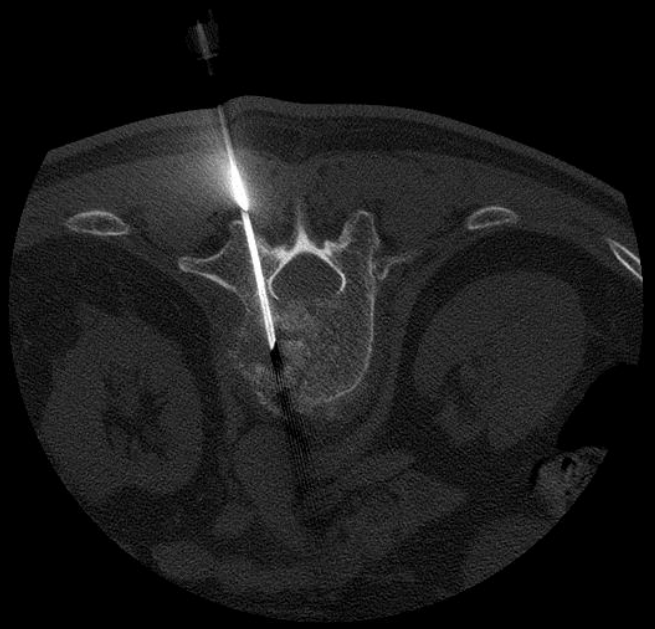




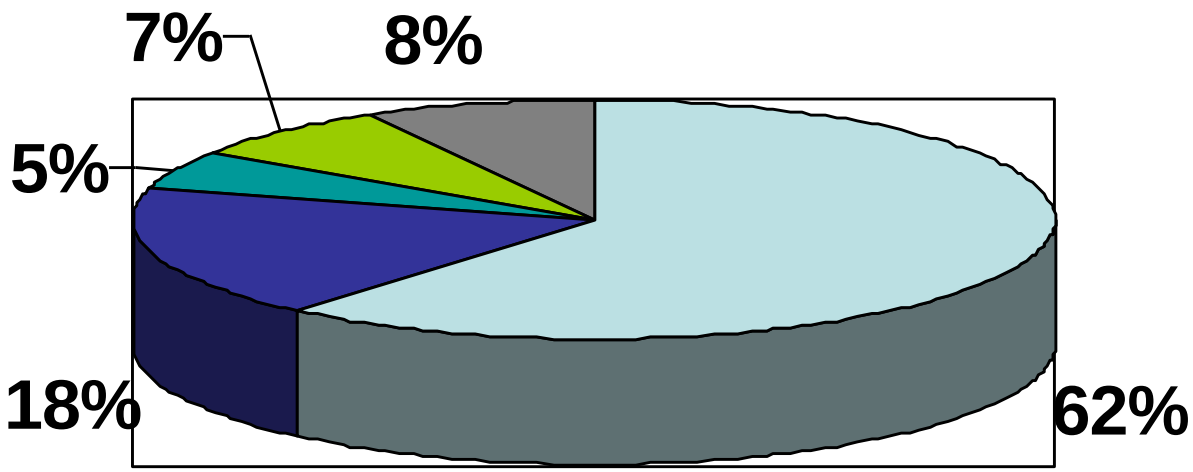




NEURORADIOLOGIA INTERVENTISTICA 2000-2009

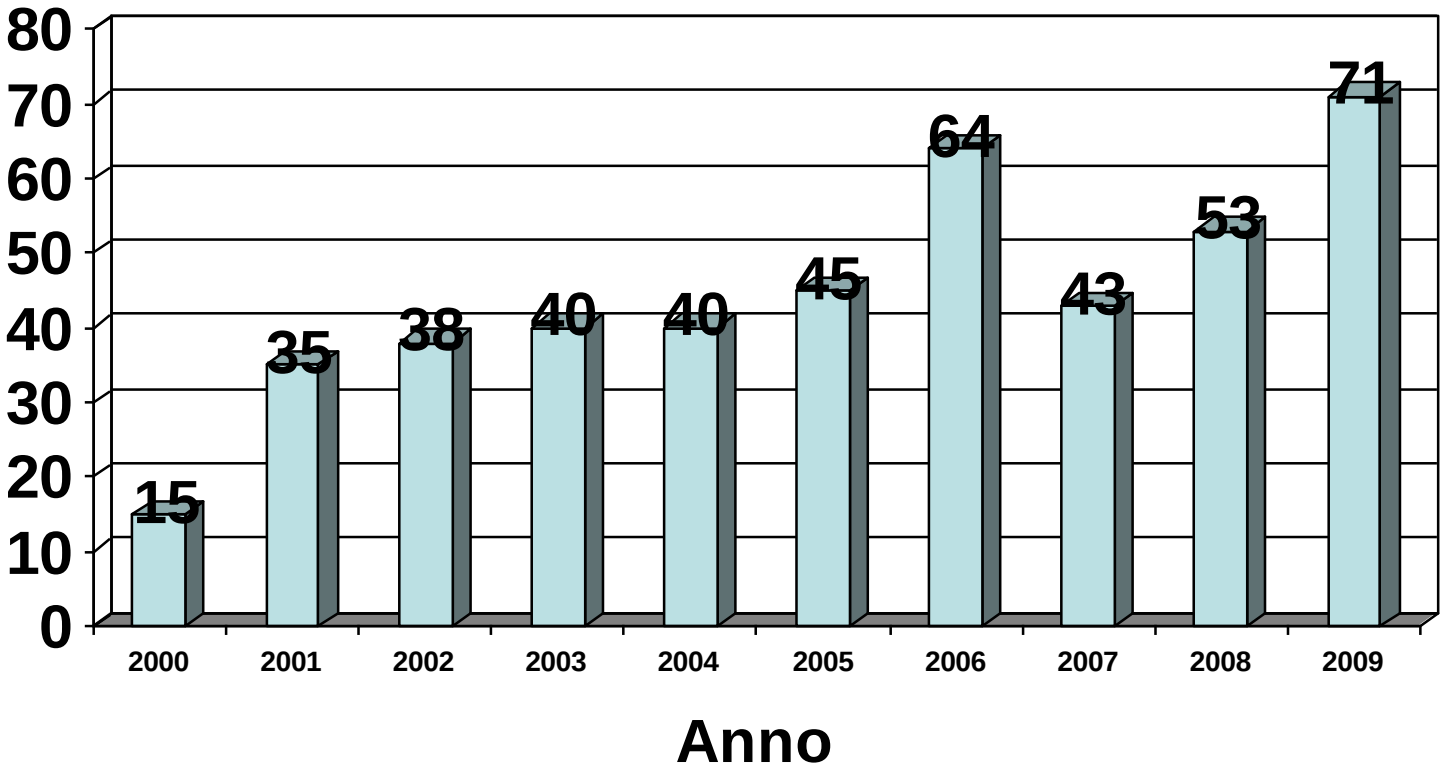
- 200 Aneurismi cerebrali
- 44 Stent carotidei
- 20 Trombolisi (7 nel 2007)
- 11 Fistole
- 8 MAV
- 20 Embolizzazioni preoperatorie
- 140 Vertebroplastiche

Tipologia di interventi



Aneurismi
Stent
Trombolisi
FAVD+MAV
Embo pre

N° Interventi/anno



Tot. Interventi 440 (media 44/anno)