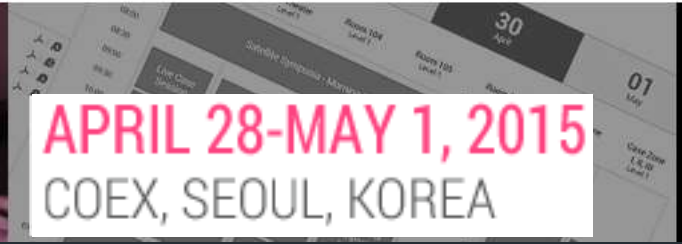


20th CARDIOVASCULAR SUMMIT
TCTAP 2015



APRIL 28-MAY 1, 2015
COEX, SEOUL, KOREA

New Treatment Strategy for Stroke Prevention During Carotid Artery Stenting

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Jagiellonian University Institute of Cardiology,
Krakow, Poland



Potential conflicts of interest

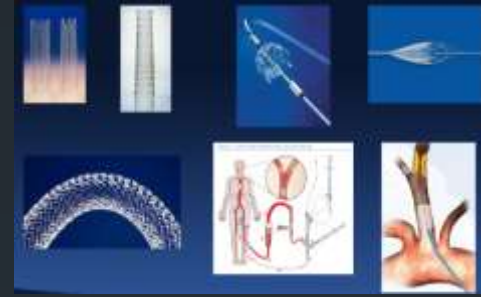
Piotr Pieniazek, MD, Ph.D.

✓ I have the following potential conflicts of interest to report.

Consulting; Study Honoraria; Travel Expenses; Trials Involvement:

- _ Boston Scientific**
- _ Abbott**
- _ Medtronic**
- Terumo**
- Cordis**
- Astra Zeneca**

2015 - XXI technology



Industry/Companies
Science (Registries,
Trials)
Operators
experience
Conferences,
Publications

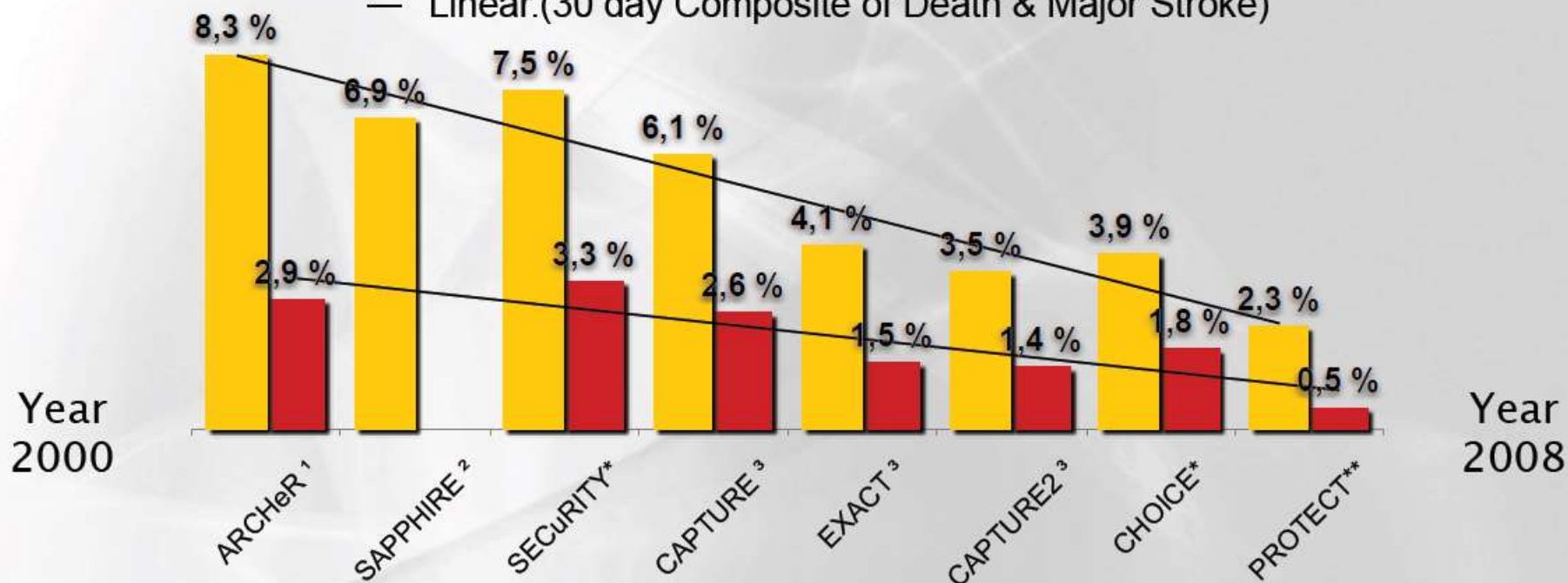


Falstart - 1998 Leicester trial (CAS vs CEA) : No EPD + Balloon
Expandable Stent + „0”- operator experience **70% complication
rate in CAS arm !!! STOP TRIAL !!!!!**

30 Day Stroke And Death Rates Are Low And Improving Over Time in High Risk Patients

- CAS results have vastly improved due to: (1) more experienced operators; (2) better patient selection and; (3) improved technology
- CAS outcomes have evolved over time similarly to CEA

■ 30 day Composite of Death, Stroke & MI
■ 30 day Composite of Death & Major Stroke
 — Linear.(30 day Composite of Death, Stroke & MI)
 — Linear.(30 day Composite of Death & Major Stroke)



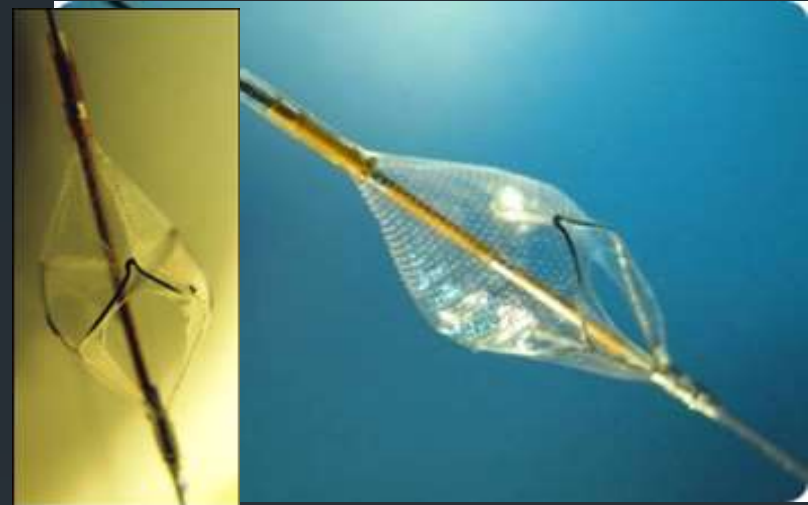
¹ Gray et al, 2006; ² Massop et al, 2009; ³ Gray et al, 2009; *Not published; **J Vasc Surg, submitted Apr, 2011

WIRION The Ultimate Solution

- The embolic filter that can be used with any guide wire
- Allows optimal filter positioning:
anywhere on the guide wire

anywhere along the vessel

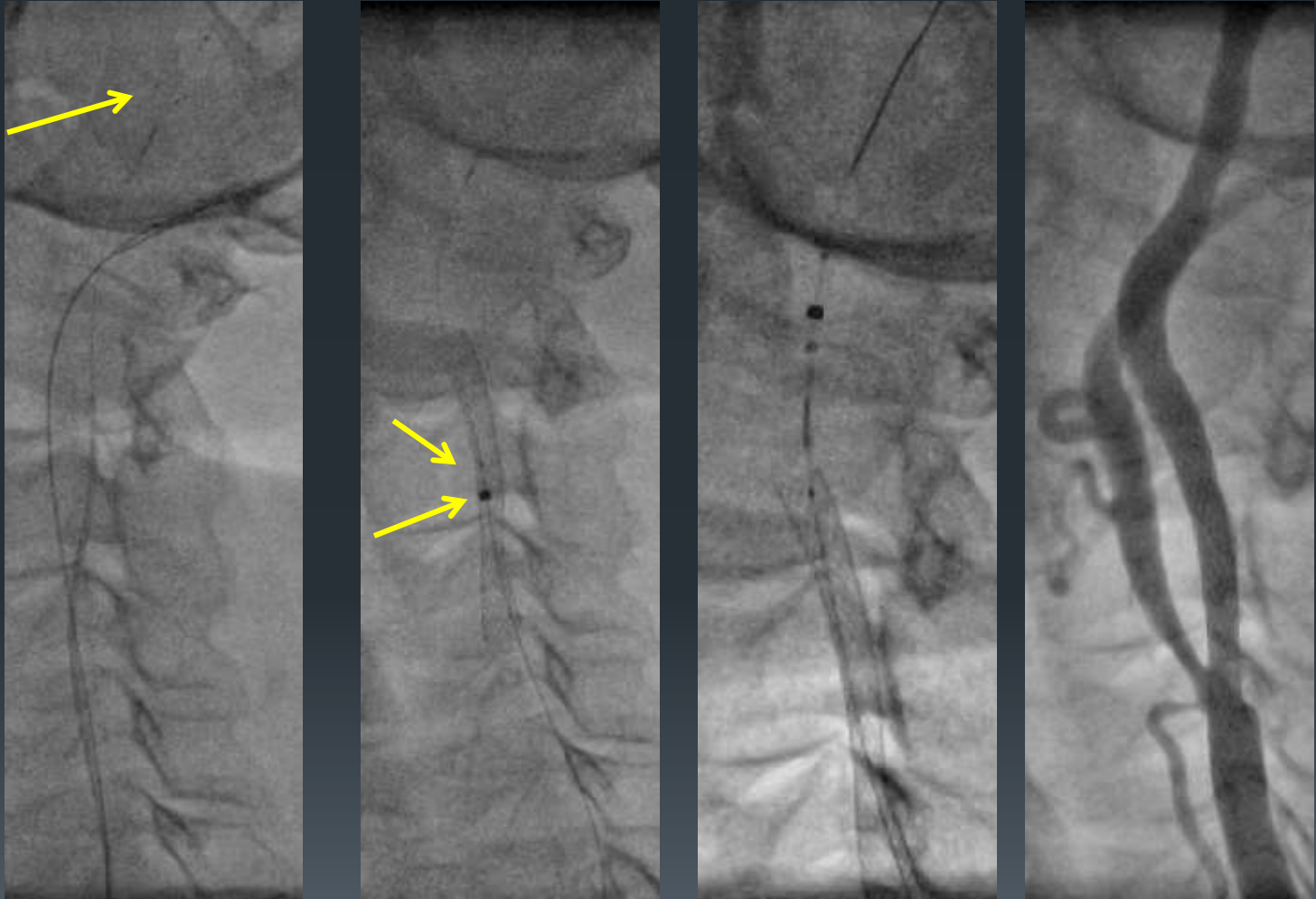
- Suitable for a wide range of vessels
- Excellent deliverability
- Excellent support and stability
- Excellent visibility
- **Superior retrieval technology**
- Ready for use



Excellent feedback from
medical community!

- ✓ Optimal wall apposition
- ✓ Strong capturing ability

2015 !! Second generation of EPD Filter - WIRION



Unique technology to pass the stent and filter removal after CAS procedures !!!.

CAS: the Challenge



Lesions in the Carotid arteries are often anatomically and morphologically very challenging



Stroke prevention by plaque coverage with a dedicated stent is mandatory.



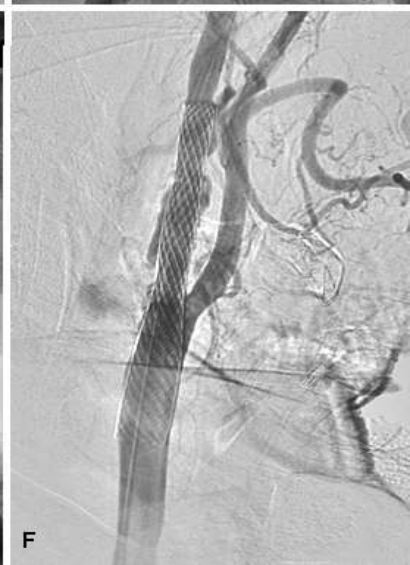
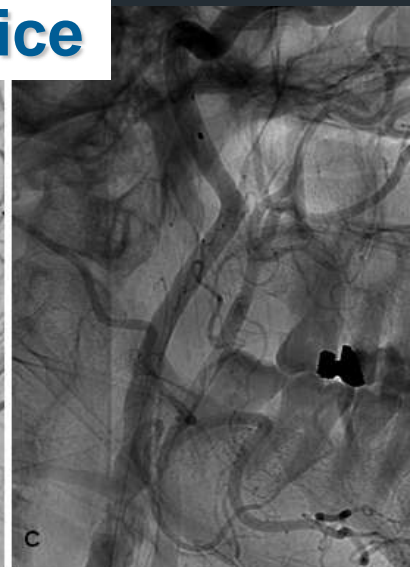
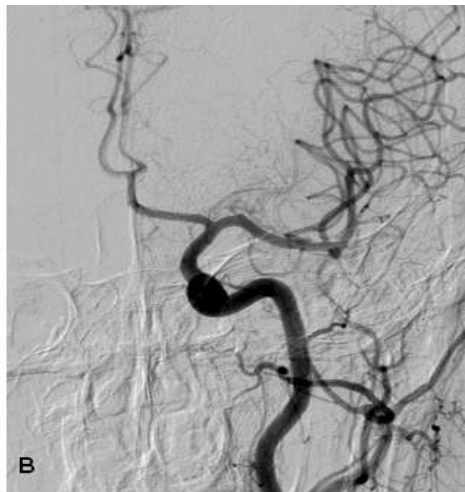
Lesion specific stenting: the solution

Definition

Lesion specific stenting:

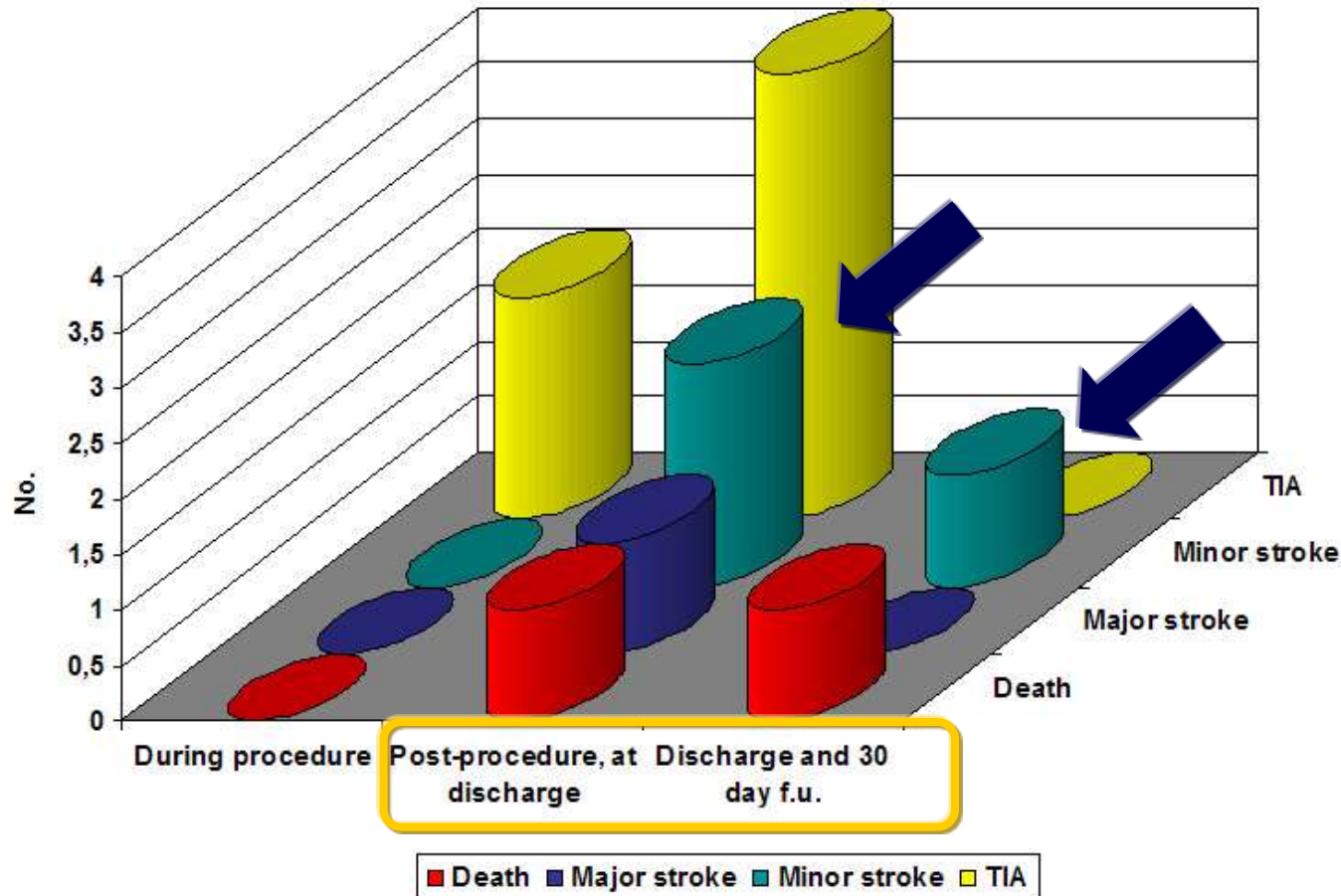
- Tailored procedure which consists in matching **stent biomechanical characteristics** to **carotid lesion features**
- **Main goal: sustained anti-embolic protection**

How to put in practice



Analysis on 377 consecutive patients

Temporal distribution of embolic events

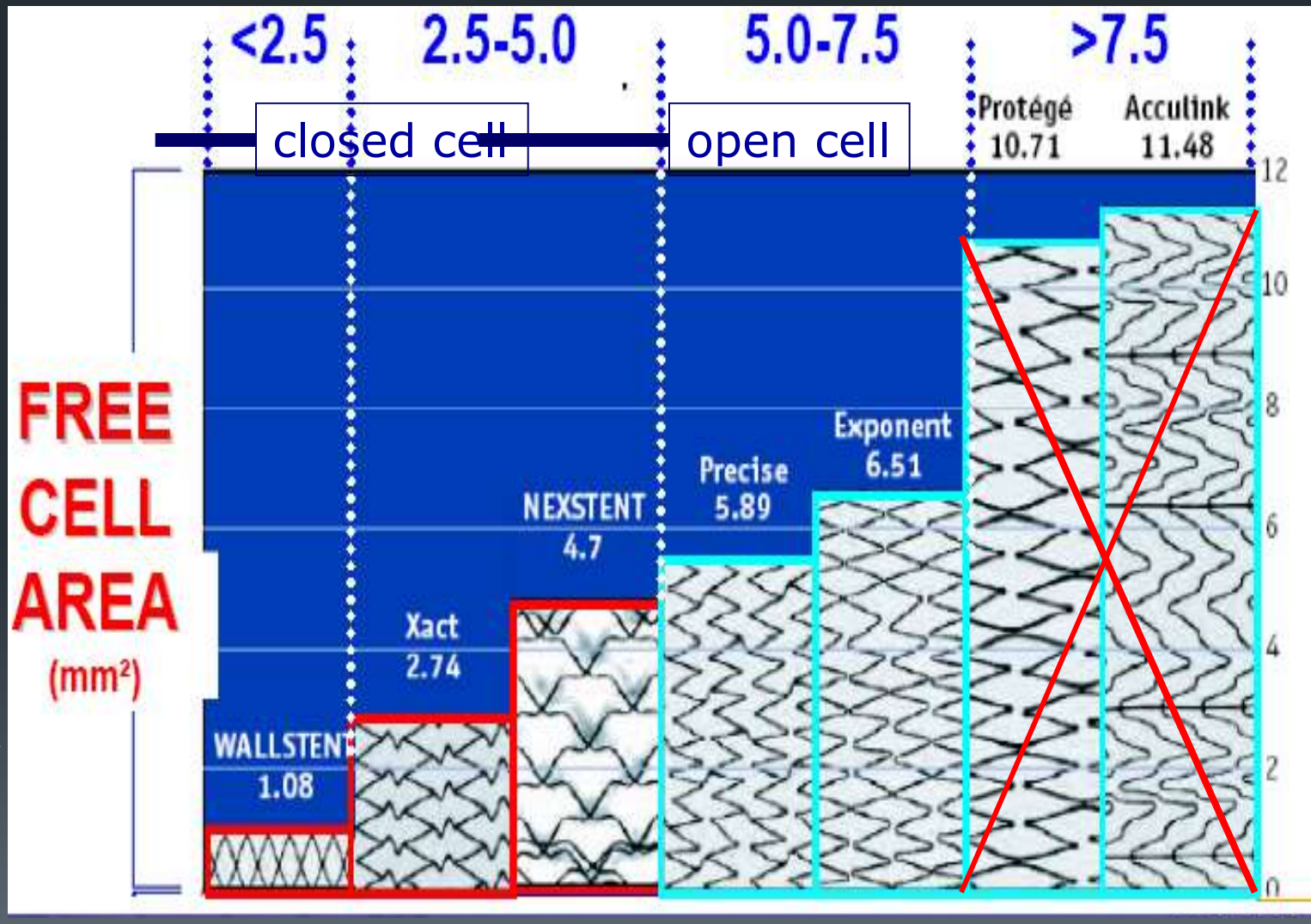


Does Free Cell Area Influence the Outcome in Carotid Artery Stenting?

The newest stent generation



Open versus closed cell design - What do we know?



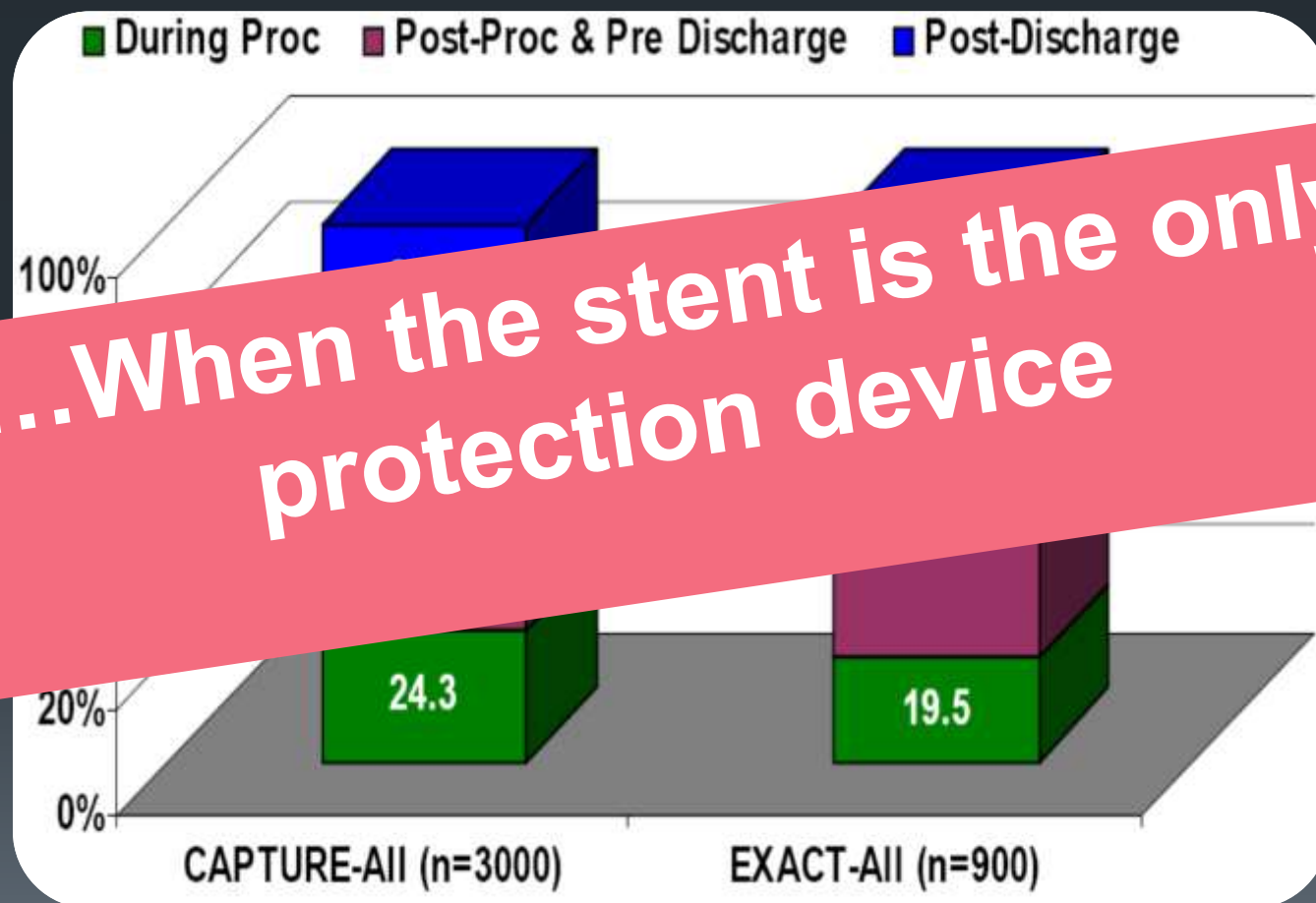
We need better protection against SMALL emboli

Per protocol	CAS N = 1,131	CEA N = 1,176	Difference	Unadjusted p-value*
All Death, Stroke, or MI	5.8% (65)	5.1% (60)	0.7%	0.5200
Death	0.53% (6)	0.26% (3)	0.27%	0.3335
Any Stroke	4.1% (46)	1.9% (22)	2.2%	0.0019
Major Stroke	0.9% (10)	0.4% (5)	0.5%	0.2005
Minor Stroke	3.2% (36)	1.5% (18)	1.7%	0.0088
MI	2.0% (22)	3.4% (40)	-1.5%	0.0387

CREST data

We need better protection against LATE emboli

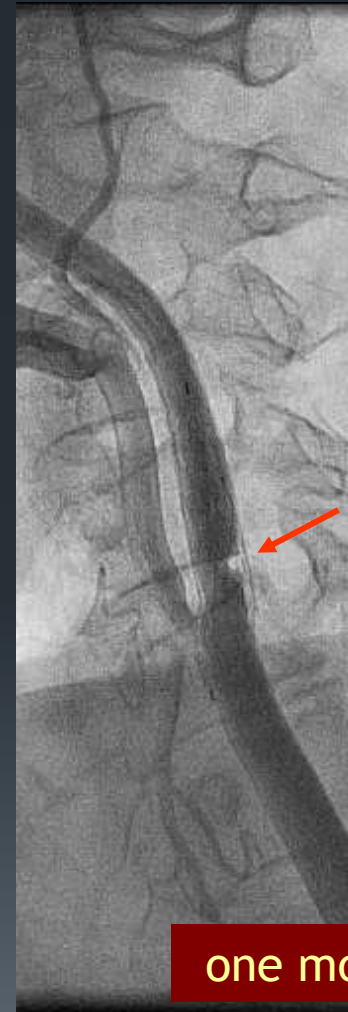
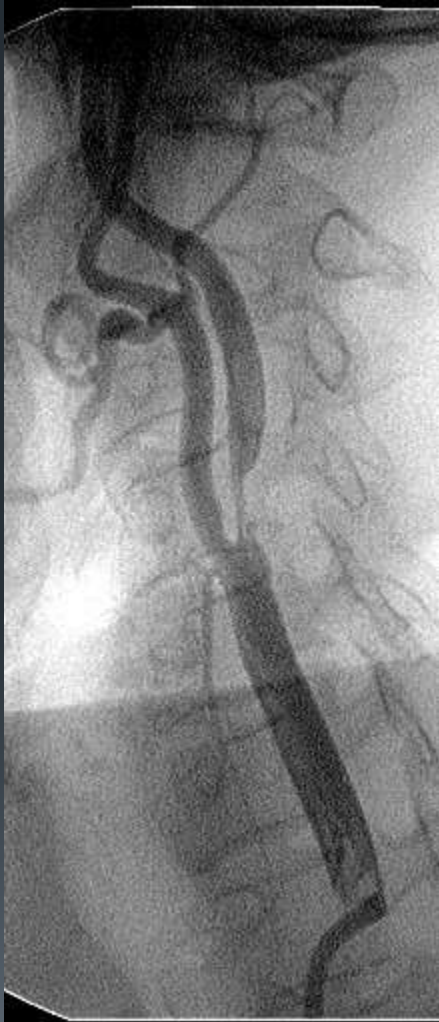
Majority of strokes occur post-procedurally (+/- 2/3)



...When the stent is the only protection device

Why stent selection is important ? !!!

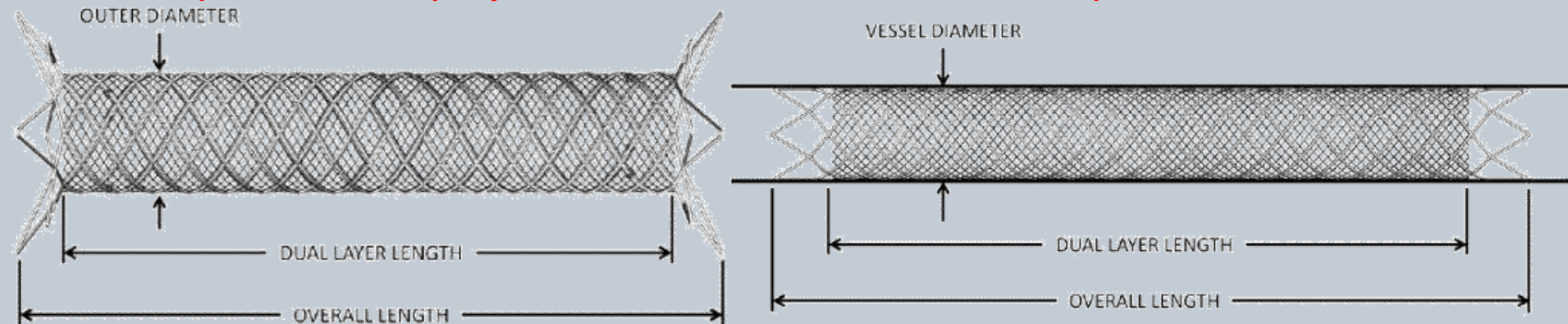
Plaque „protrusion“ – blocked by closed cells of hybrid stent



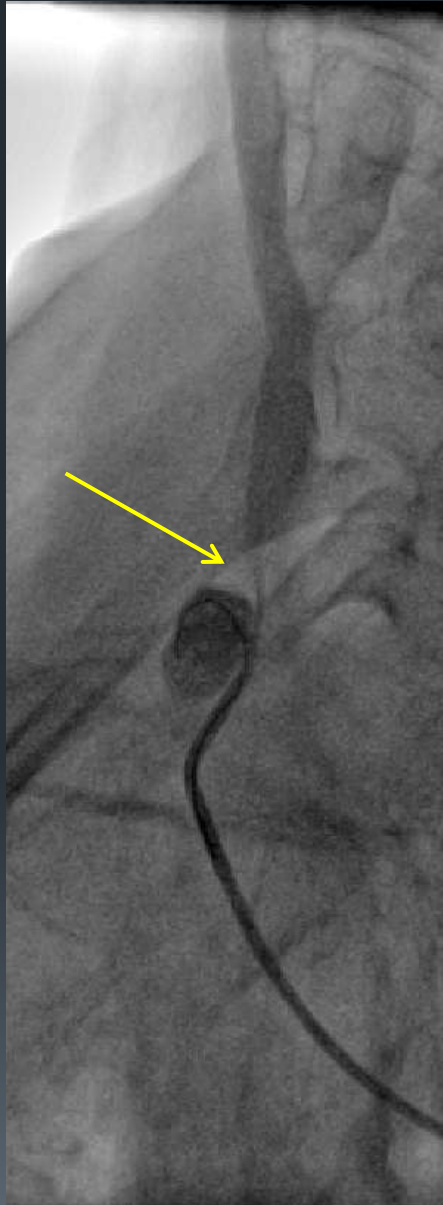
one month later

RoadSaver Carotid Stent

- double layer micromesh scaffold
- enabling sustained embolic protection by very tight plaque coverage
- embolic protection starts with implantation of the stent into the lesion and continues throughout the process of neointimalization
- **up to 50% deployment full re-sheathable and repositionable**



Pt. 70 y.o. – history of radiation therapy of jaw cancer 10 y ago



**CEA –
contraindicated**

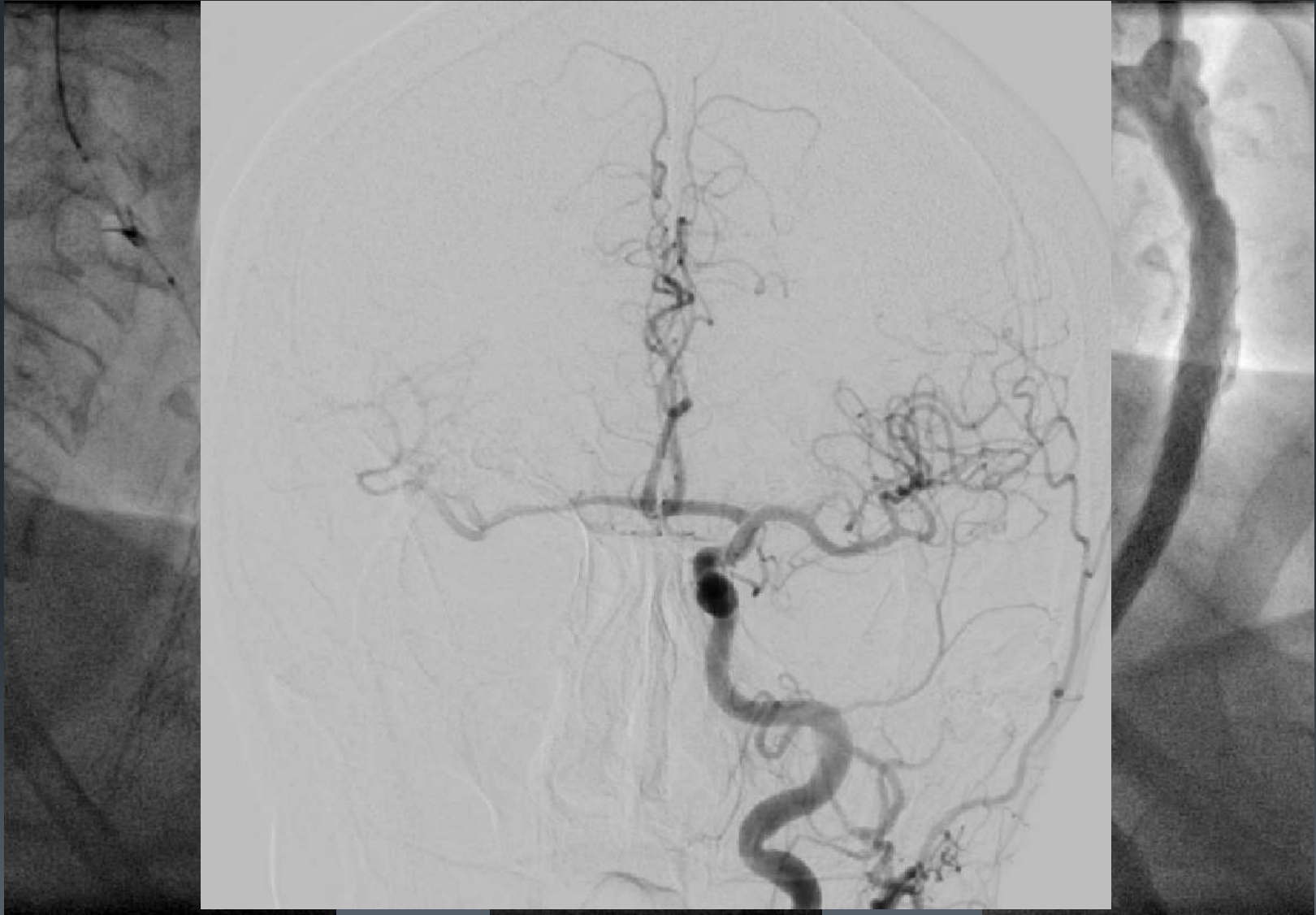
**CAS – high risk
for distal
embolization !!!**

XXI technology !!!!!!!

MESHSTENT –Roadsaver optimal strategy for safe CAS procedure



Uncomplicated CAS procedure with Roadsaver stent implantation

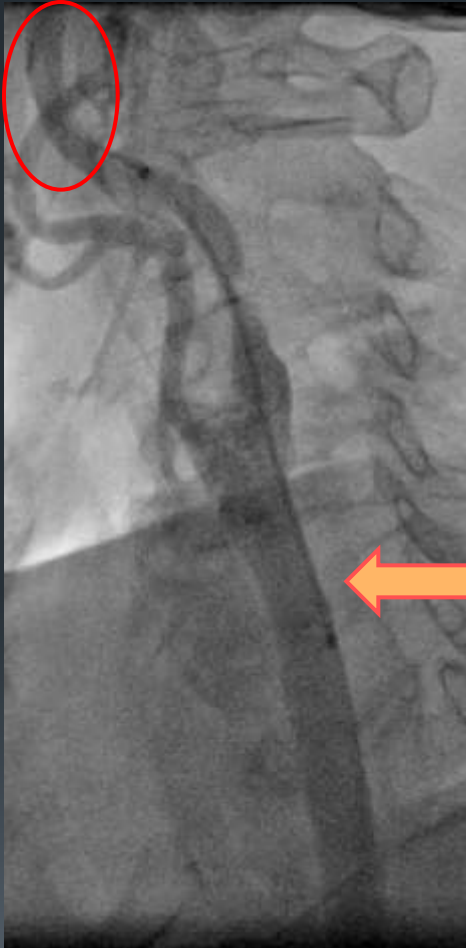


Novel technology for better brain protection :CAS in 2015

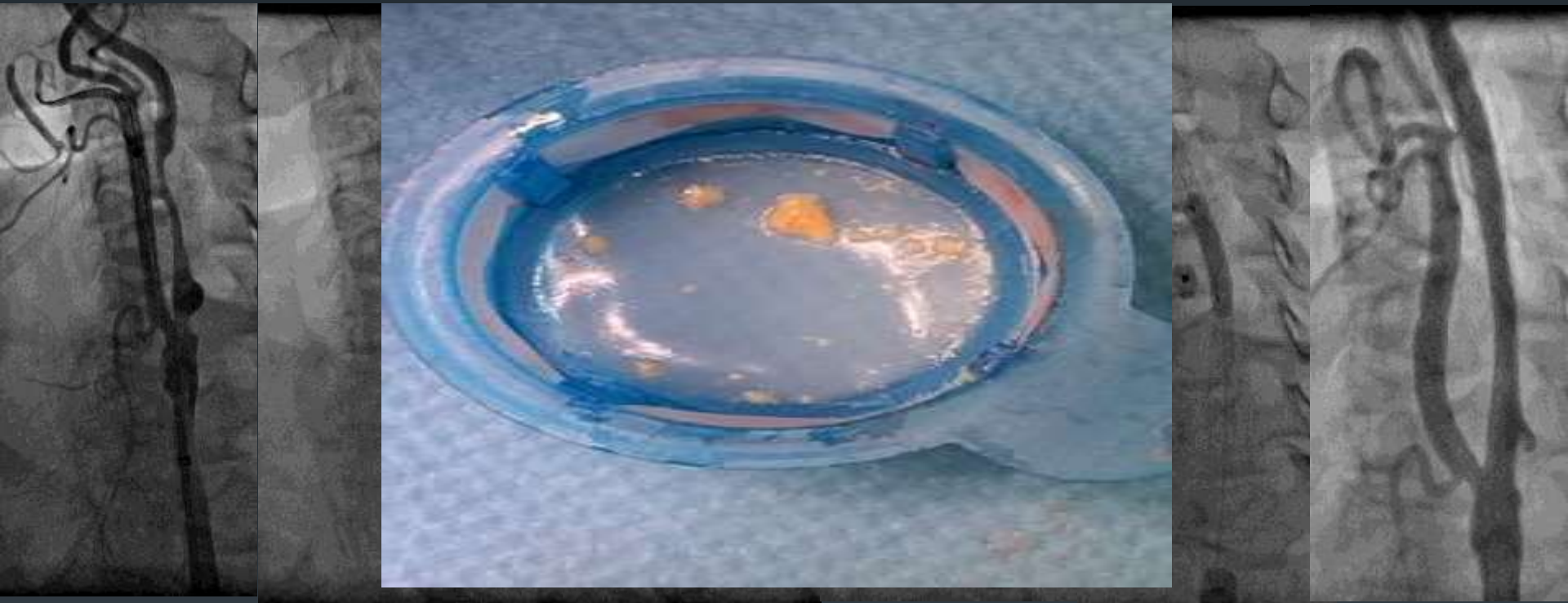


Independent coronary guidewire for lesion crossing and filter Wirion placement + Roadsaver (new carotid meshstent) !!!!!

Novel technology for better brain protection: CAS in 2014



Long asymptomatic LICA lesion with huge plaque burden



The safest option for CAS procedure in 2015 -
Mo.Ma + Roadsaver stent

01/2012. 67 y. o. woman with symptomatic BCT stenosis (drop attacks, vertigo)



According to the Guidelines and our own experience procedure seems to be **simple and quick** !!!!

continue...

**01/2012. 67 y. old Women with symptomatic BCT
stenosis - (drop attacks, vertigo)**



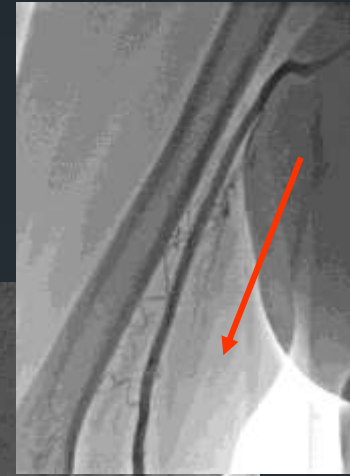
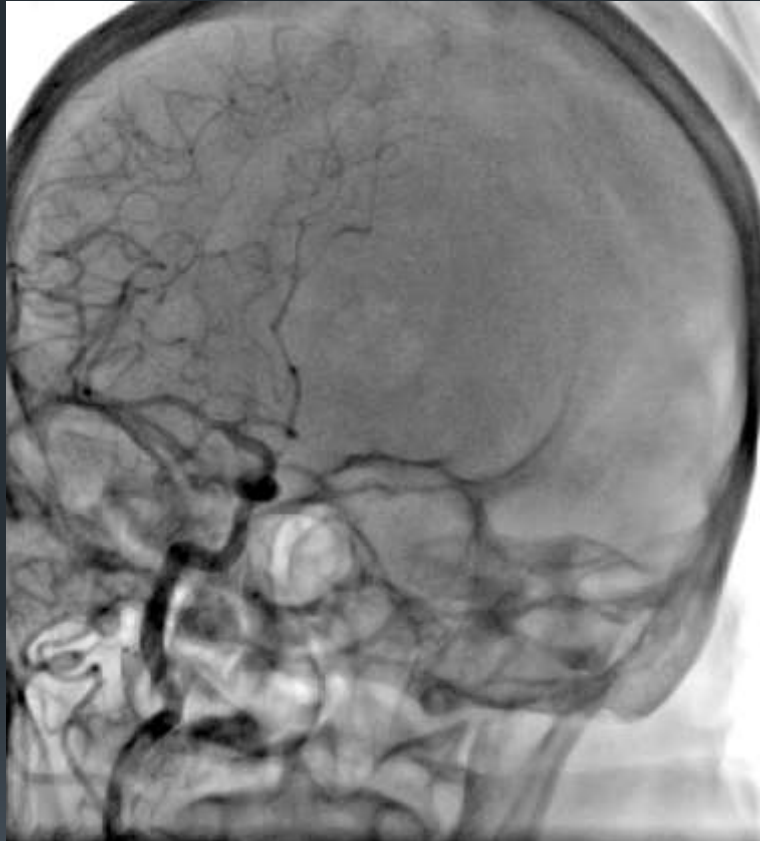
We did direct stenting:

Neptun 8,0/25mm (balloon expandable stent)

6 & 10 ATM postdilatation !!!

continue...

But...**immediately** after postdilatation the patient **lost consciousness**; left hemiplegia, generalized seizures and apnea episodes were observed the patient **required emergency intubation**



Cerebral angio showed disseminated occlusions of small right hemispheric vessels...moreover...**acute ischemia of right hand was observed**

continue...

Case # 16 - 01/2012. 67 y. o. woman with symptomatic BCT stenosis

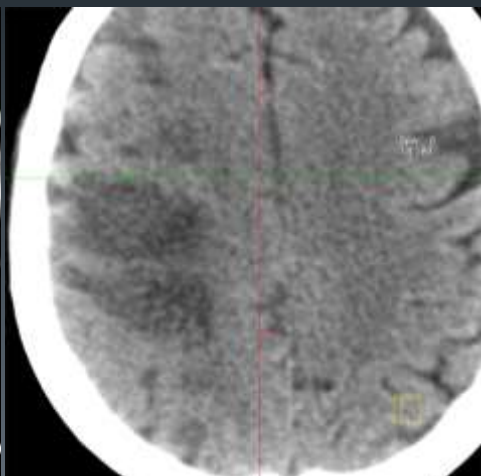
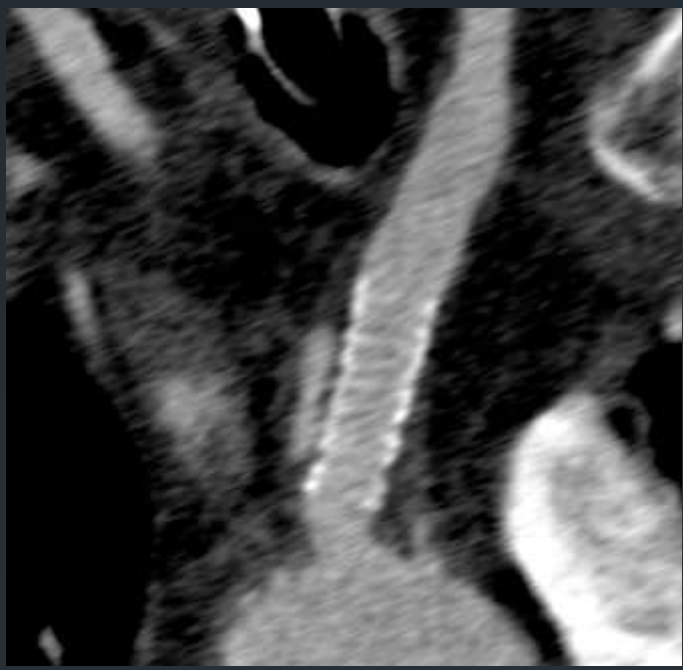
Pt required 6 day on ICU stay

Then was admitted to Neurology & Rehabilitation Ward:

NIHSS-6
RANKIN 3.

Brain CT –multifocal ischaemic lesions !!

CT-angio showed properly implanted stent.



◆ LETTER TO THE EDITORS

Double Filters: A Protection Technique
for High-Risk Innominate Artery
Angioplasty

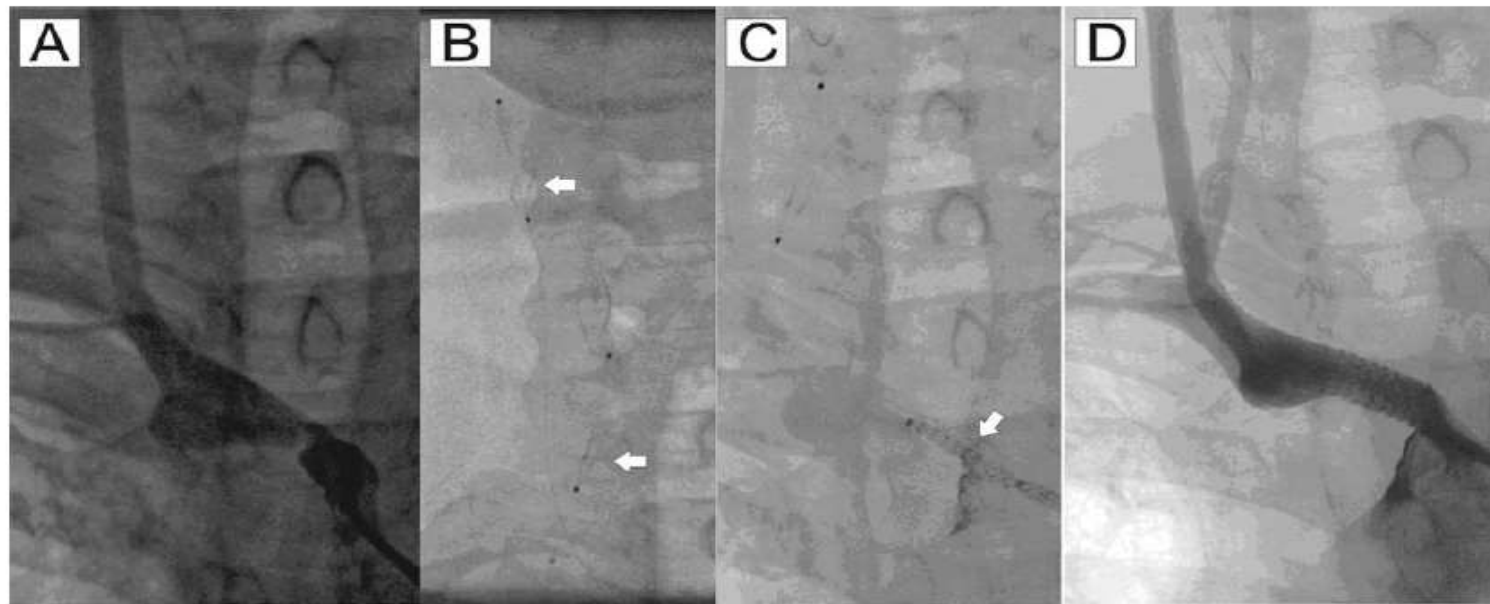
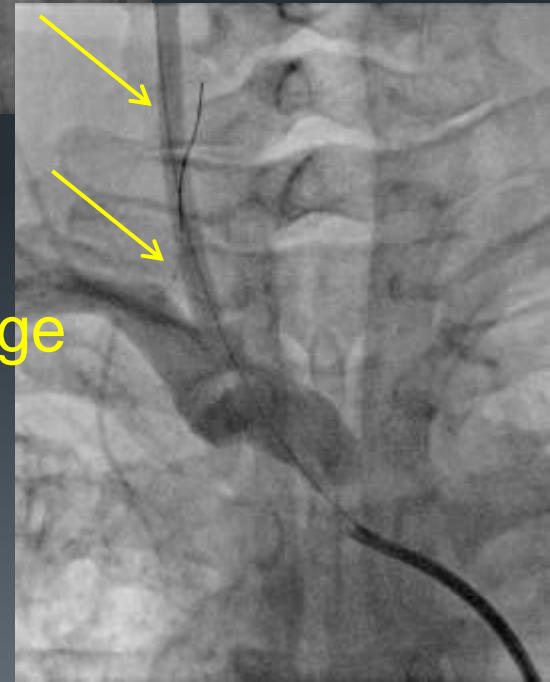
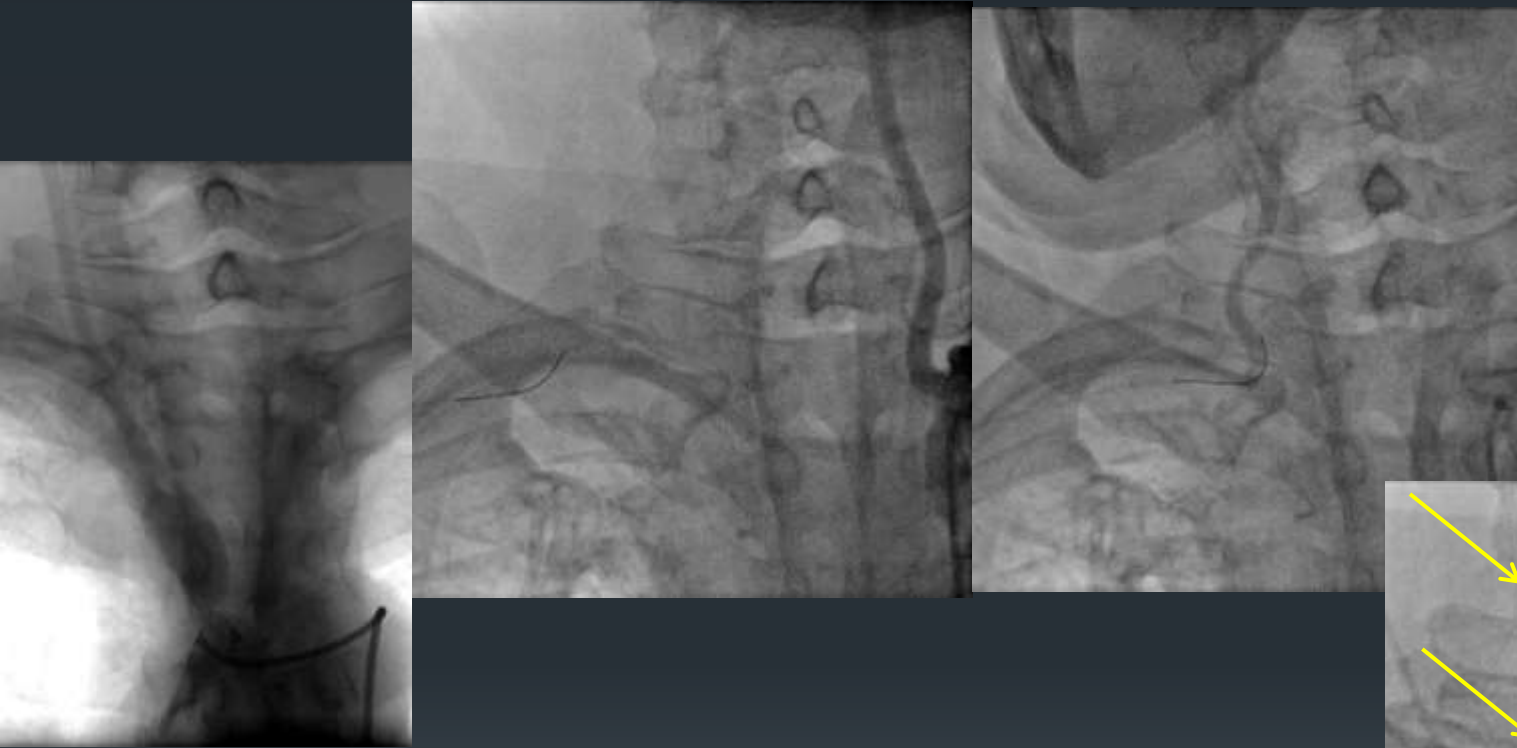


Figure ◆ (A) Critical innominate artery stenosis at angiography. (B) Two SpiderFX neuroprotection systems opened in the right internal carotid artery (upper small arrow) and in the right vertebral artery (lower small arrow). (C) A balloon-mounted Neptun 7×16-mm over-the-wire peripheral stent (large arrow) is positioned at the level of innominate artery stenosis. (D) Final angiographic result.

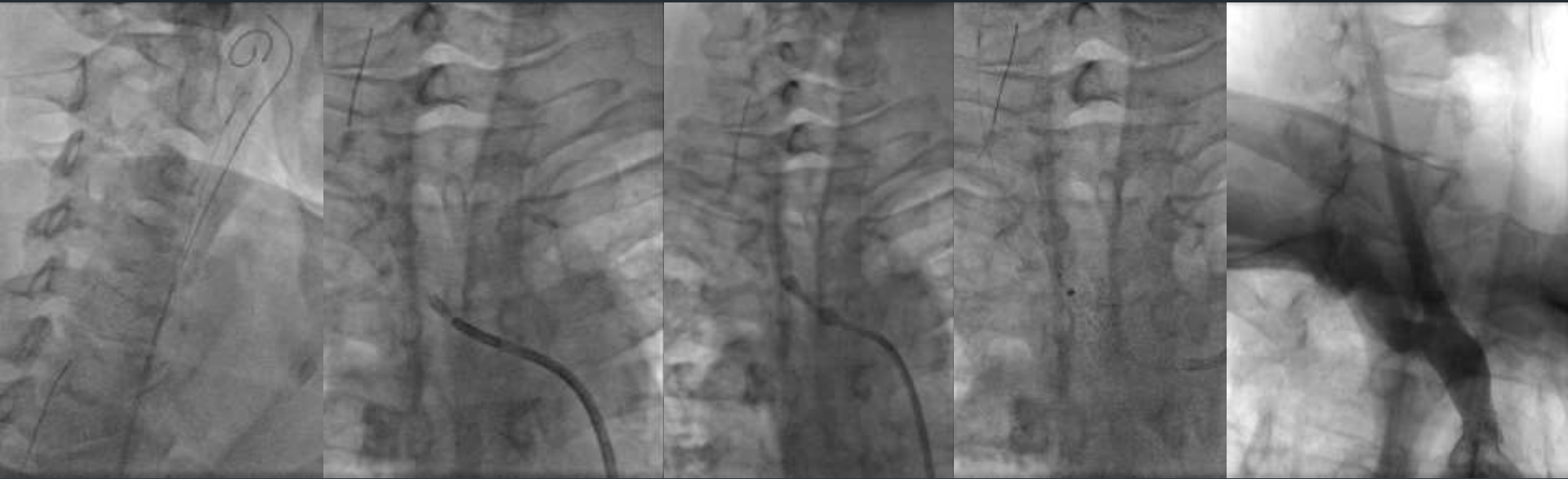
Double Protection for High Risk IA Stenting:



Radial access for RVA protection with PercuSurge

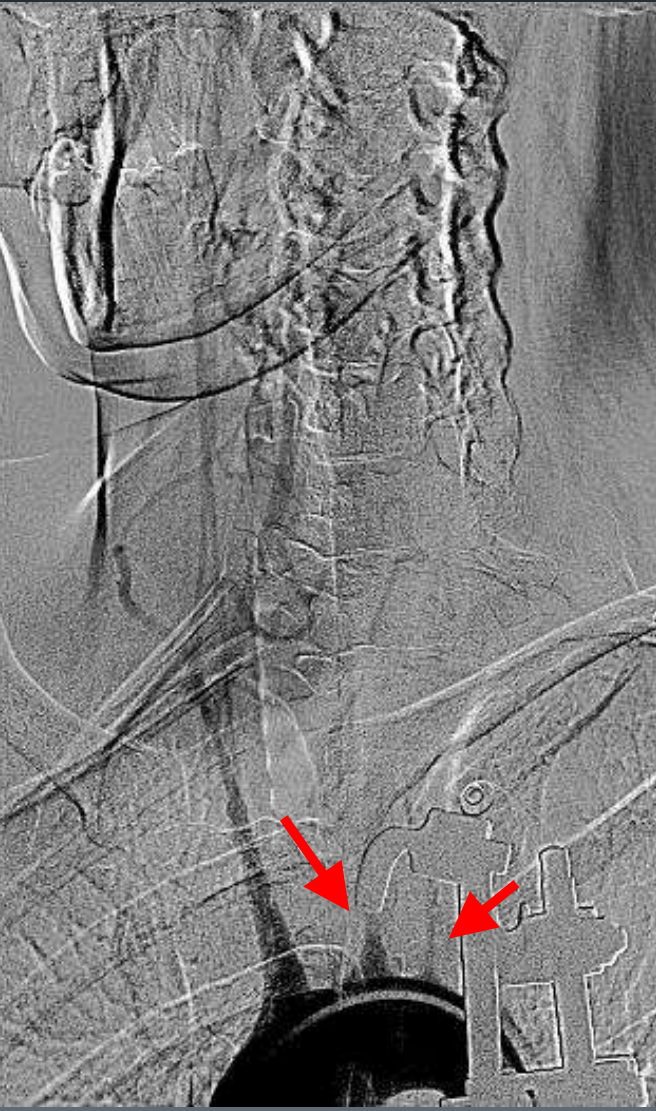
Femoral access for RICA protection with Filter

Double Protection for High-Risk IA Stenting :



Wirion Filter for RICA protection & PercuSurge for RVA Protection

Pts.TA age 33 with TAKAYASU
-Syndrome (recurrent TIA!!!!)

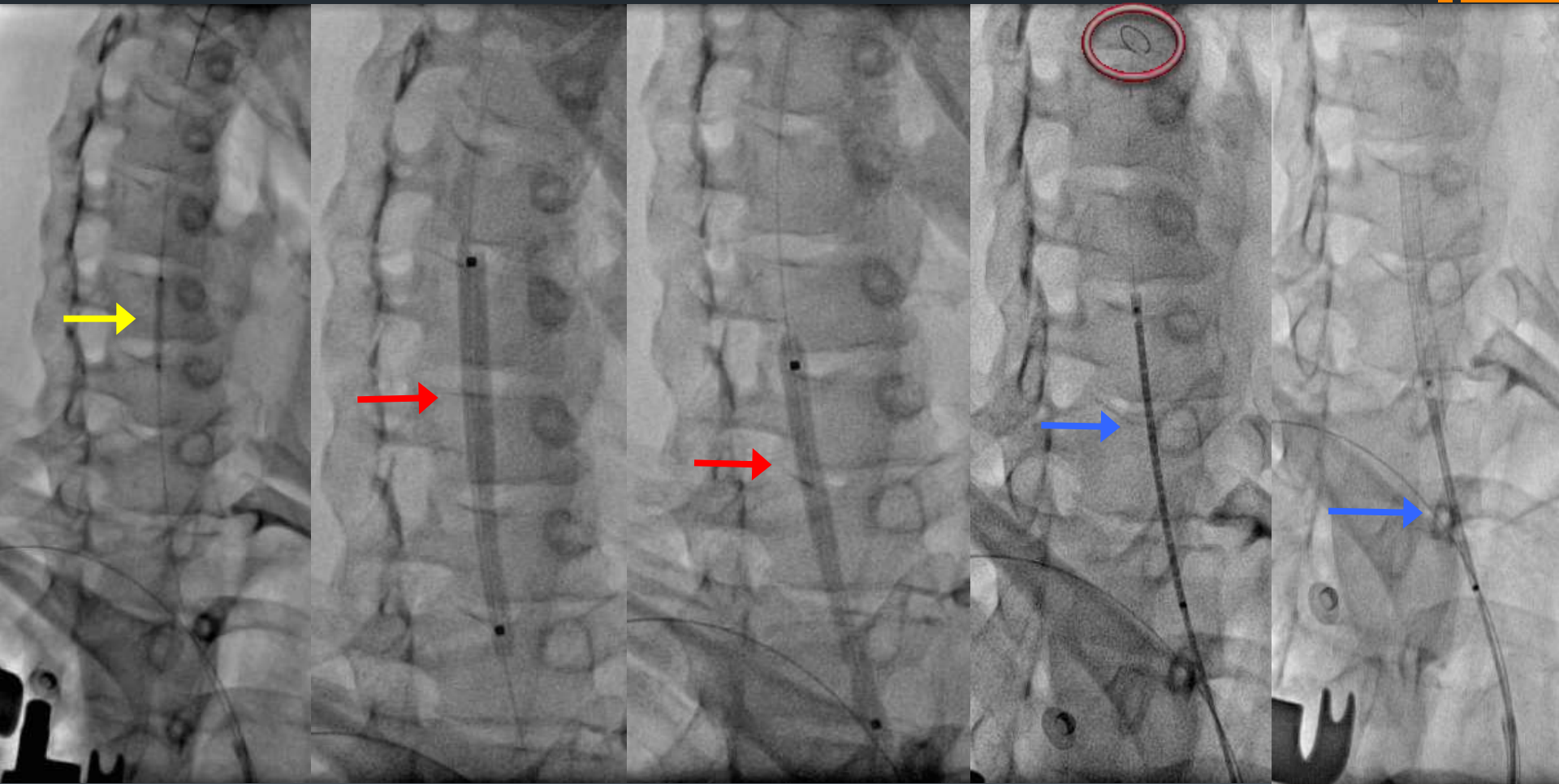


Dramatic image of
the overgrowing
arteries

Red Arrows :
LSA & LCCA
occlusions

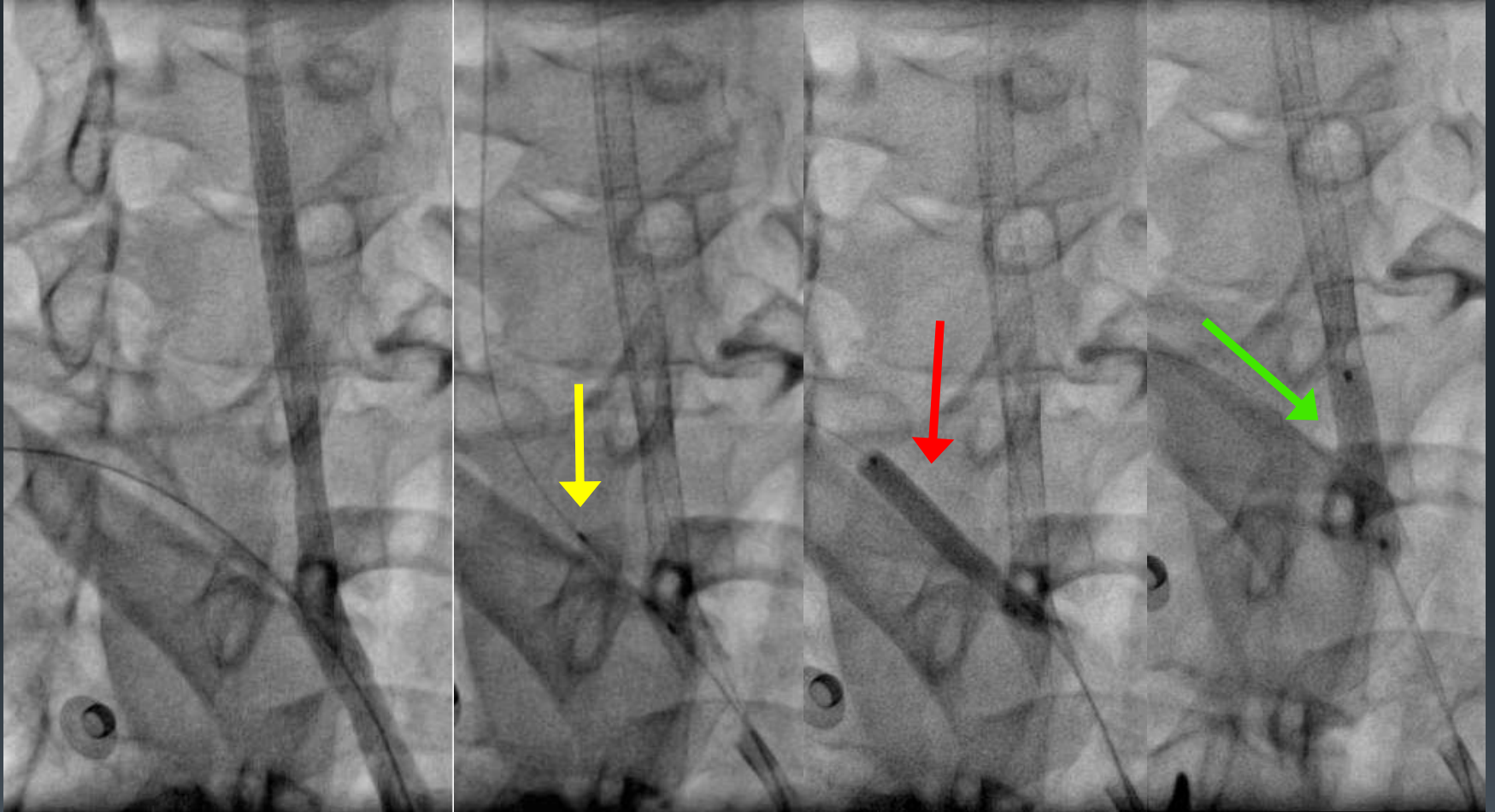
Yellow Arrows:
RSA i RCCA long
tight stenosis.

Pts.TA age 33 with TAKAYASU -Syndrome (recurrent TIA!!!!)



DEB, self expandable stents , distal NPD – Filter Wire

Pts.TA age 33 with TAKAYASU
-Syndrome (recurrent TIA!!!!)



DES implantation to the RSA

Pts.TA age 33 with TAKAYASU
-Syndrome (recurrent TIA!!!!)



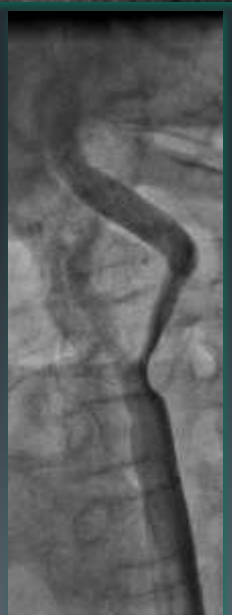
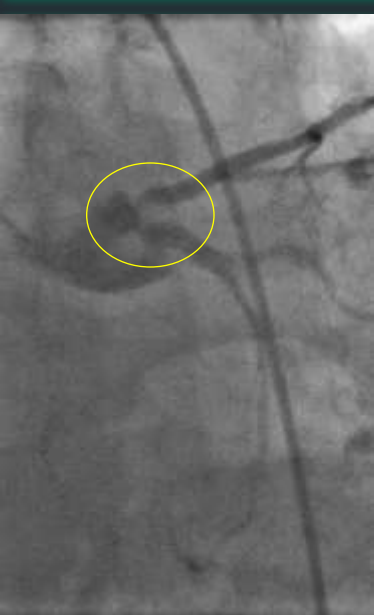
Final effect. Normalization of intracranial circulation . Complete resolution of neurological symptoms !!!!!

ICA stenosis coexisting with MVD - risk of complications

CABG related stroke is associated with higher risk of in-hospital death (14% vs. 2.7% for no-stroke patients, $p < 0.001$) and prolonged time of hospitalization

Risk of stroke during CABG procedure and ICA stenosis:

- patient without significant ICA stenosis (<50%) – 1.8%
- patient with significant ICA stenosis (50-99%) - 3.2%
- patient with bilateral significant ICA stenosis (50-99%) - 5.2%
- patient with significant ICA stenosis and contralateral occlusion – 7.1%
- patient with significant, SYMPTOMATIC ICA stenosis – 8.5%



F.W., 84 y.o. man:

CCS III/IV

Diabetes

Arterial hypertension

Coronarography:

3 vessel CAD including
LM stenosis equivalent

RICA - 50%

LICA - 80%

How should I treat ?

17 MAR 2014

First in Poland:

CAS in local anesthesia and subsequent CABG

One hybrid room – two teams



12:20 CAS begins

12:41 stent implantation

12:50 end of CAS



LICA-CAS

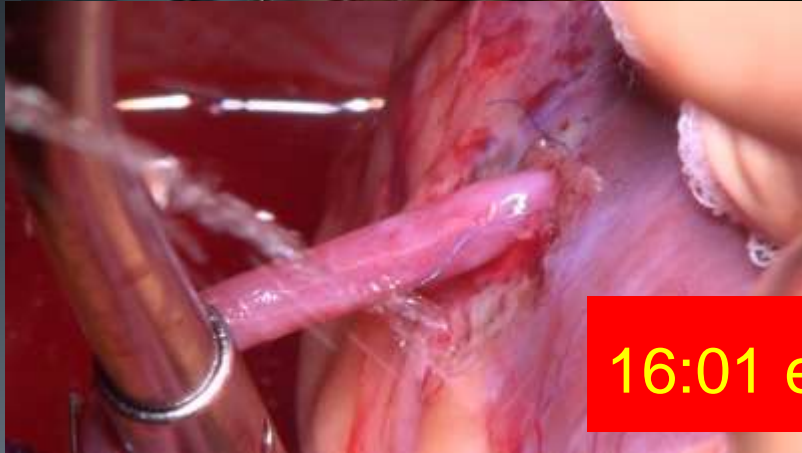
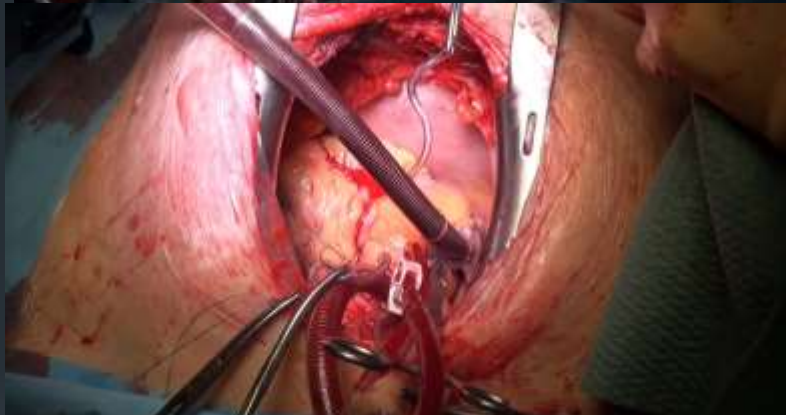
17 MAR 2014

13:10 intubation

13:40 start of CABG



New treatment strategy



16:01 end of CABG



Conclusions



- **CAS** is a **fast developing** interventional treatment of carotid artery stenosis.
- Great **technological progress is observe** in the devices used for Carotid Artery Stenting.
- **New strategies** for CAS treatment lead to better outcome.
- **Experience of operators** have direct impact on the time of CAS procedures and better results even in pts. with high risk of complications.

Thank you



John Paul II Hospital Krakow PL