

Sessione VII

FOCUS ON CON L'ESPERTO

La stenosi carotidea della signora Clotilde
Ferdinando Varbella



Tremendous worldwide mortality impact



The 10 leading causes of death in the world

2012

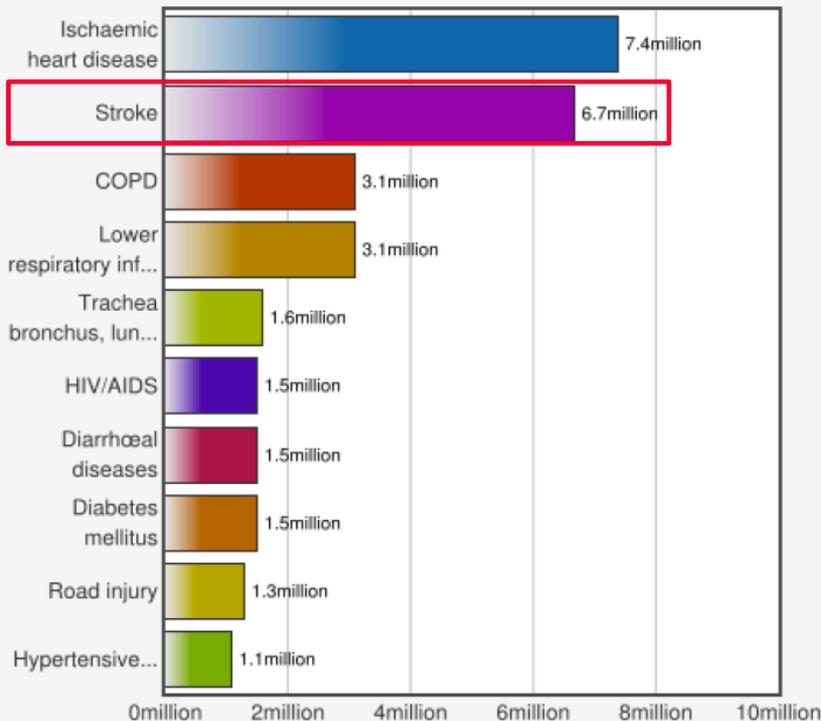
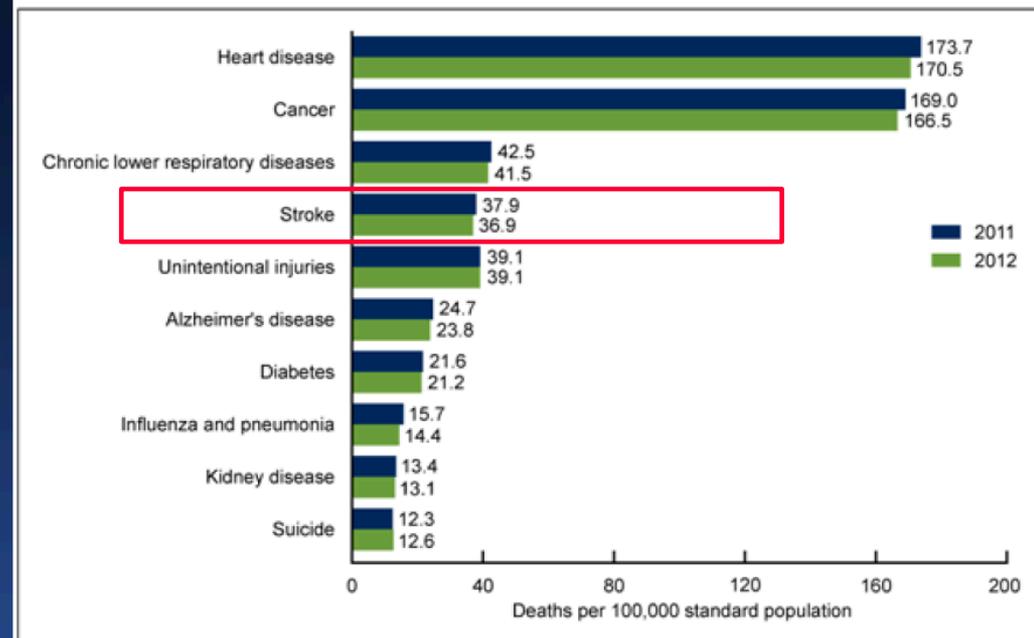


Figure 3. Age-adjusted death rates for the 10 leading causes of death in 2012: United States, 2011-2012



NOTE: [Access data table for Figure 3](#) [PDF - 8 KB].

SOURCE: CDC/NCHS, National Vital Statistics System, Mortality.

EPIDEMIOLOGIA STROKE. USA

800.000 STROKE /ANNO

progressione STROKE intra ricovero 25%

mortalità a 1 anno 10-20%

disabilità e/o dipendenza parziale 25-50%

demenza 34%

41 billions \$\$\$/anno

- WHO 2002 (World wide)
 - 15.3 million strokes per year
 - 5.5 million deaths every year

EPIDEMIOLOGIA STROKE



200.000 STROKE /anno

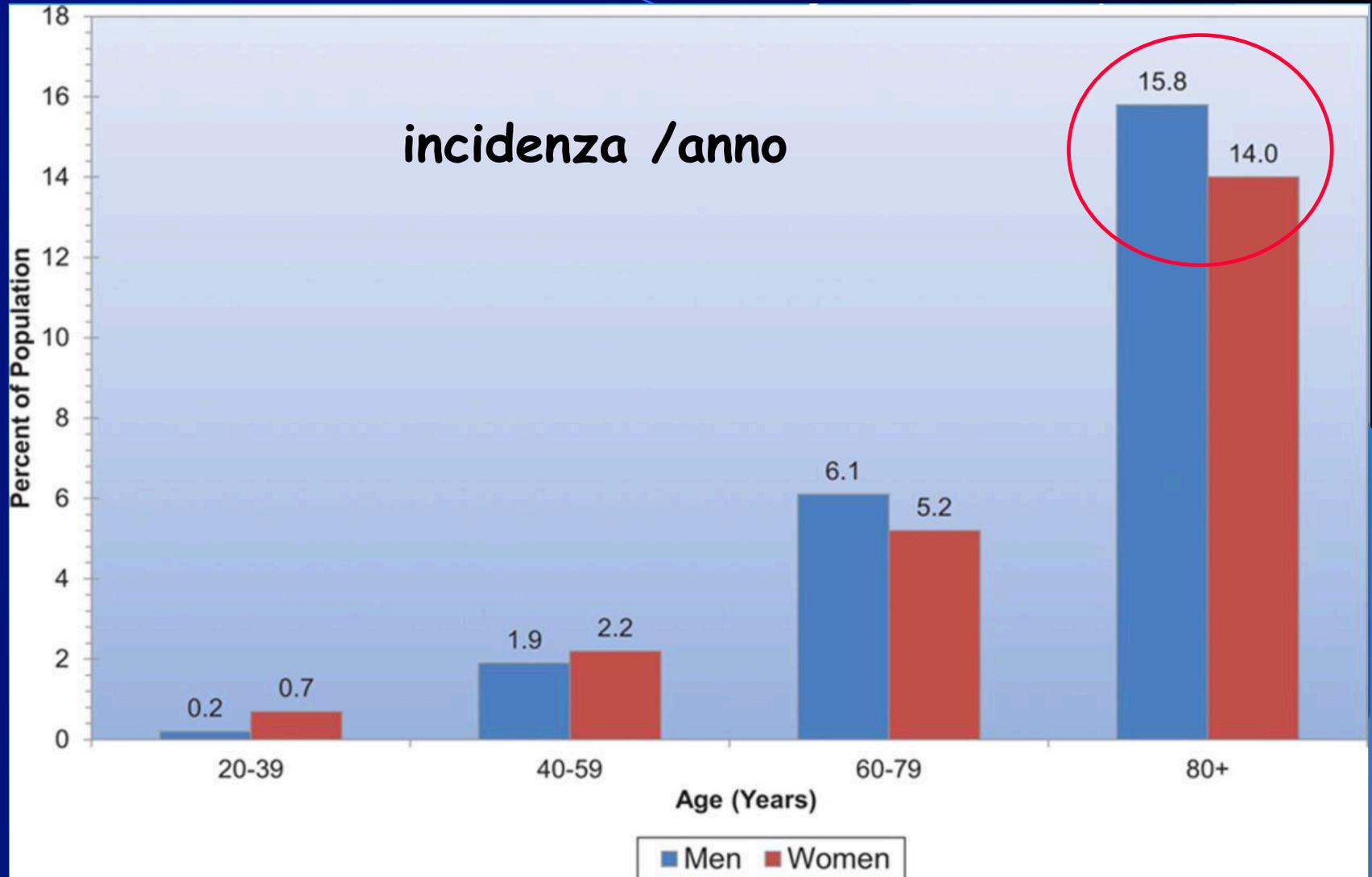
75% in persone > 65 anni

10-20% morte 1 mese

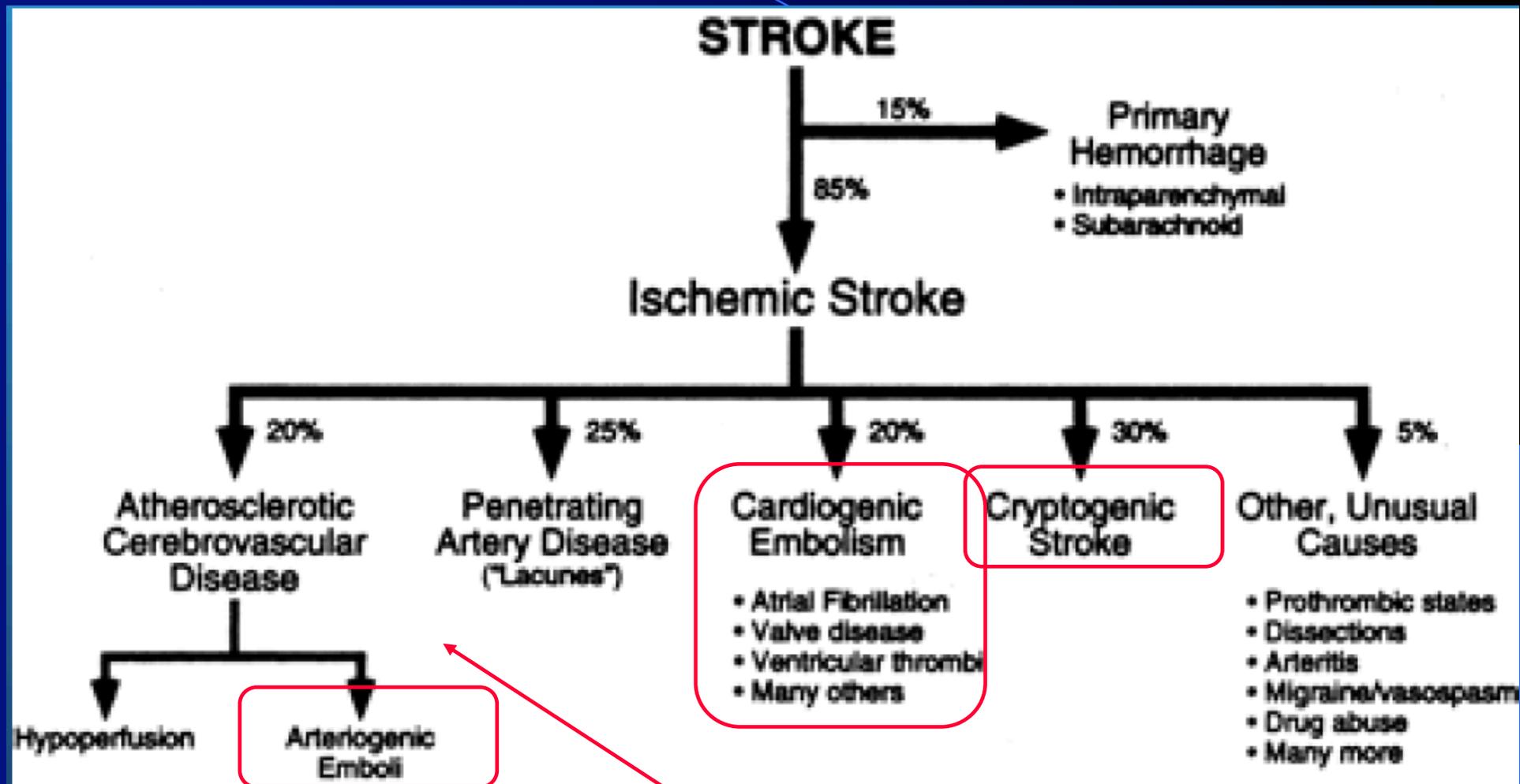
+ 10% morte 1 anno

stima quasi di 1.000.000 disabili

EPIDEMIOLOGIA STROKE USA



IL CARDIOLOGO AGISCE SULLA PREVENZIONE



correzione fattori di rischio, trattamento di ipertensione, dislipidemia.

IL CARDIOLOGO AGISCE SULLA PREVENZIONE

Trattamento FA
Aspirina, Plavix
Anticoagulanti
chiusura PFO
occlusione auricola sinistra
stenting carotideo

STROKE

15%

85%

Primary Hemorrhage

- Intraparenchymal
- Subarachnoid

Ischemic Stroke

20%

25%

20%

30%

5%

Atherosclerotic Cerebrovascular Disease



Penetrating Artery Disease ("Lacunes")

Cardiogenic Embolism

- Atrial Fibrillation
- Valve disease
- Ventricular thrombi
- Many others

Cryptogenic Stroke

Other, Unusual Causes

- Prothrombic states
- Dissections
- Arteritis
- Migraine/vasospasm
- Drug abuse
- Many more

Arterio-genic Emboli

CAUSE PRINCIPALI

- STROKE CARDIOEMBOLICO 30%
- STROKE CRIPTIGENETICO 25%
- STENOSI CAROTIDEA 20%
- ATEROSCLEROSI INTRACRANICA 15%

quasi sempre si tratta di occlusione embolica e non di
trombosi in situ

PERCHE' IL CARDIOLOGO ?

- MANTENIMENTO DEL RITMO SINUSALE
- TERAPIA MEDICA OTTIMALE pressione
colesterolo
- TERAPIA ANTIAGGREGANTE (ASA, Plavix)
- TERAPIA ANTICOAGULANTE (NAO)

PERCHE' IL CARDIOLOGO ?

- MANTENIMENTO DEL RITMO SINUSALE
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colesterolo
- TERAPIA ANTIAGGREGANTE (ASA, Plavix)
- TERAPIA ANTICOAGULANTE (NAO)
- TRATTAMENTO CAROTIDE EXTRACRANICA
- TRATTAMENTO DELLO STROKE ACUTO ?

TRATTAMENTO DELLA CAROTIDE EXTRACRANICA (prevenzione dello stroke)



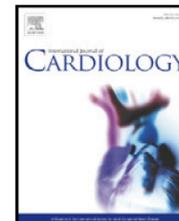


ELSEVIER

Contents lists available at ScienceDirect

International Journal of Cardiology

journal homepage: www.elsevier.com/locate/ijcard



Setting up a multidisciplinary program of carotid artery stenting in a community hospital: Initial experience of 277 patients



Ferdinando Varbella^a, Andrea Gagnor^a, Cristina Rolfo^a, Enrico Cerrato^a, Mario Bollati^a, Alfonso Gambino^a, Paolo Giay Pron^a, Massimo Hartwig^a, Monica Reggiani^b, Salvatore Amarù^b, Emilio Luda di Cortemiglia^b, Francesco Tomassini^{a,*}

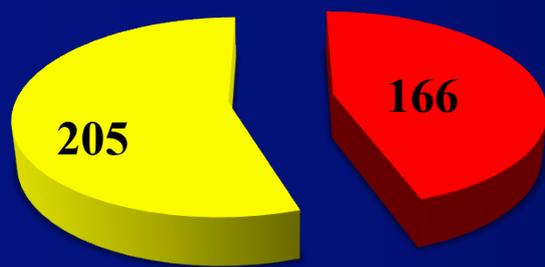
^a Department of Cardiology, Infermi Hospital, Rivoli, Italy

^b Department of Neurology, Infermi Hospital, Rivoli, Italy

2014

valutazione Neuro indipendente 30 gg

371 PTA CAROTIDEE TOTALI



- SINTOMATICI
- ASINTOMATICI

Minor stroke	3	0.8%
Major stroke	2	0,5%
Morte	1	0,2%
Vasc	3	0.8%
	9	2.4%

Daniela Z. aa 62 fumatrice TIA

LICA
basale



Daniela Z. aa 62 fumatrice TIA

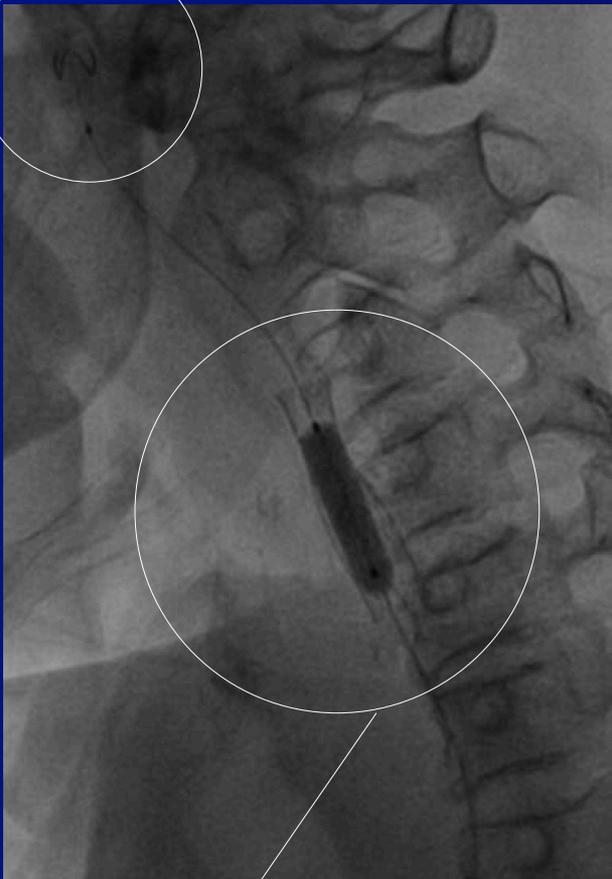
filtro



LICA
basale

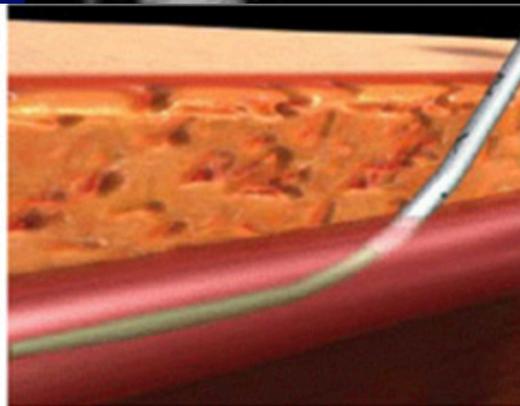
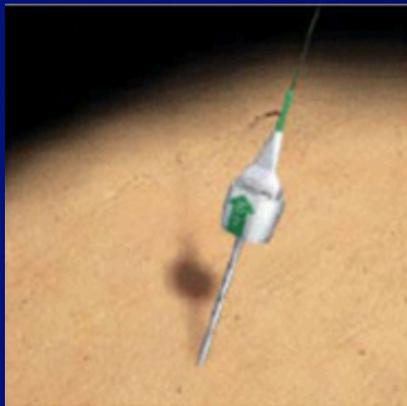
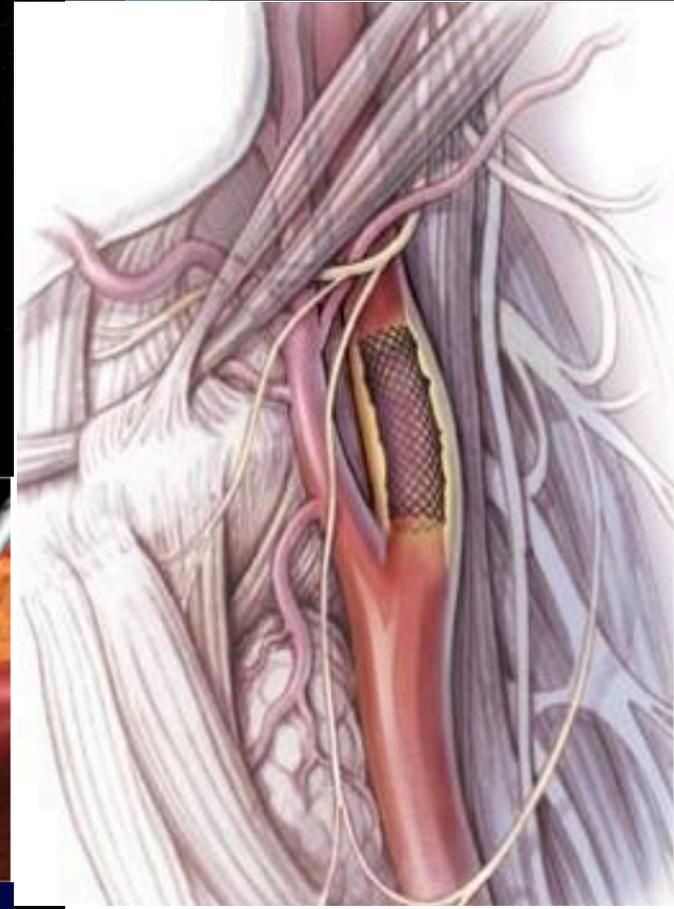
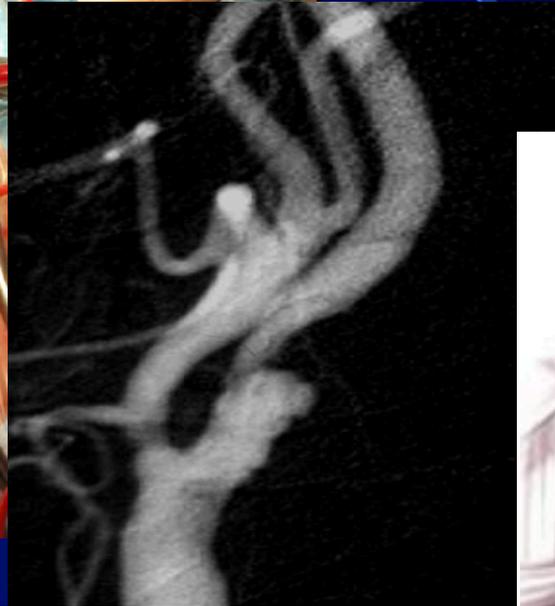
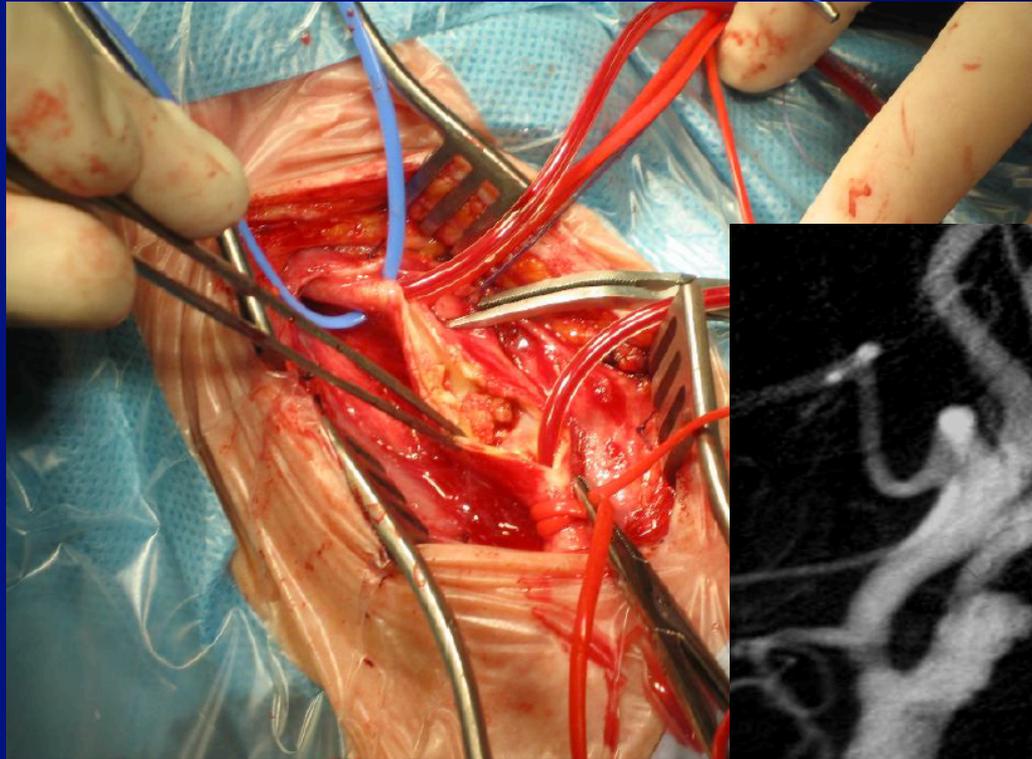


LICA finale

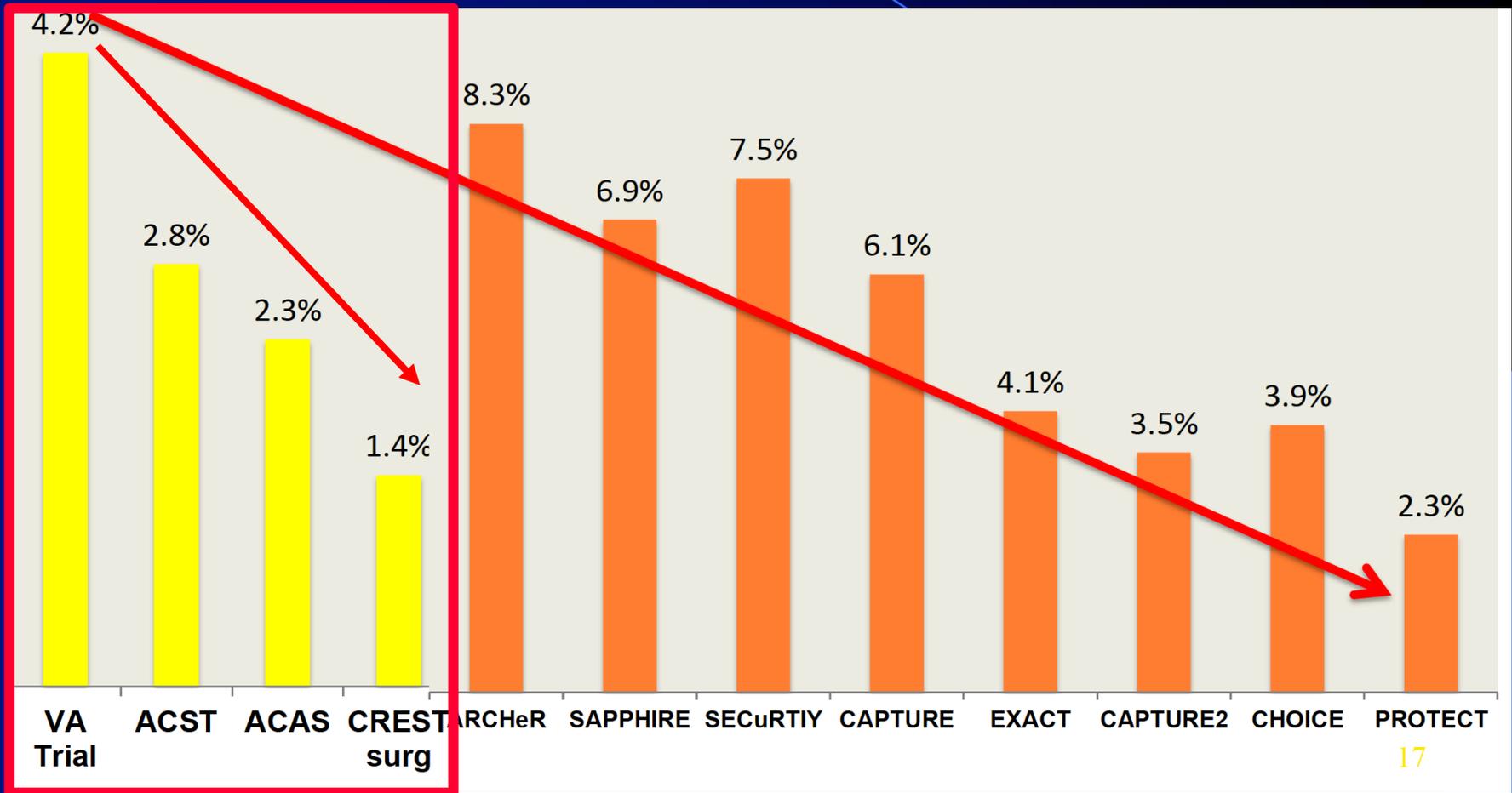


stent

STENT O CHIRURGIA



COMPLICAZIONI DEL TRATTAMENTO DELLA CAROTIDE EXTRACRANICA



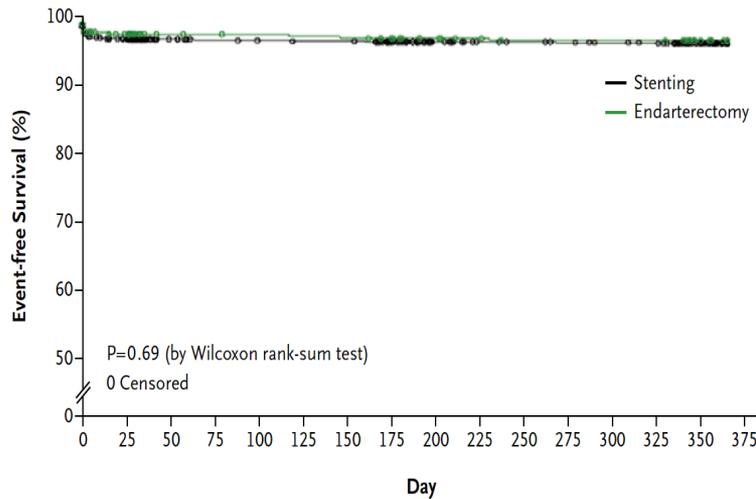
**CHIRURGIA
VASCOLARE**

**ANGIOPLASTICA CON STENT E
PROTEZIONE EMBOLICA**

ORIGINAL ARTICLE

Randomized Trial of Stent versus Surgery for Asymptomatic Carotid Stenosis

Kenneth Rosenfield, M.D., M.H.C.D.S., Jon S. Matsumura, M.D., Seemant Chaturvedi, M.D., Tom Riles, M.D., Gary M. Ansel, M.D., D. Chris Metzger, M.D., Lawrence Wechsler, M.D., Michael R. Jaff, D.O., and William Gray, M.D., for the ACT I Investigators*



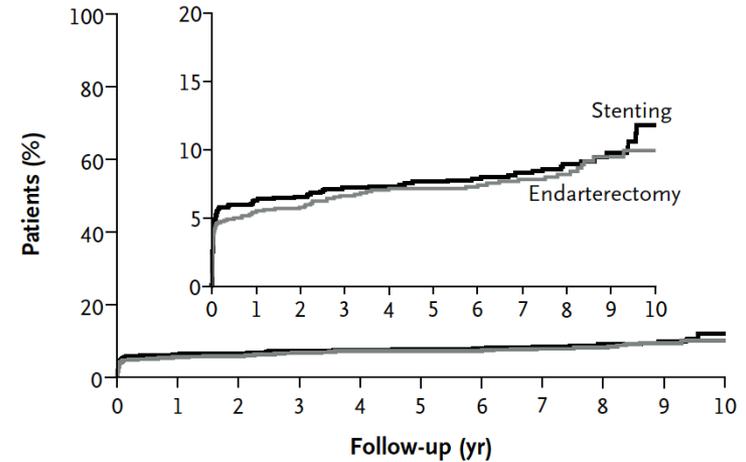
Days	0	1-30	31-180	181-365
Stenting (no. at risk)	1089	1067	1016	956
Endarterectomy (no. at risk)	364	354	325	309

ORIGINAL ARTICLE

Long-Term Results of Stenting versus Endarterectomy for Carotid-Artery Stenosis

Thomas G. Brott, M.D., George Howard, Dr.P.H., Gary S. Roubin, M.D., Ph.D., James F. Meschia, M.D., Ariane Mackey, M.D., William Brooks, M.D., Wesley S. Moore, M.D., Michael D. Hill, M.D., Vito A. Mantese, M.D., Wayne M. Clark, M.D., Carlos H. Timaran, M.D., Donald Heck, M.D., Pierre P. Leimgruber, M.D., Alice J. Sheffet, Ph.D., Virginia J. Howard, Ph.D., Seemant Chaturvedi, M.D., Brajesh K. Lal, M.D., Jenifer H. Voeks, Ph.D., and Robert W. Hobson II, M.D.,* for the CREST Investigators†

A Primary Composite End Point



No. at Risk

Endarterectomy	1240	1104	1036	949	833	736	695	620	438	243	66
Stenting	1262	1103	1041	972	884	774	738	676	477	264	68

Carotid Artery Stenting Versus Endarterectomy for Stroke Prevention

A Meta-Analysis of Clinical Trials



TABLE 1 Trial Characteristics

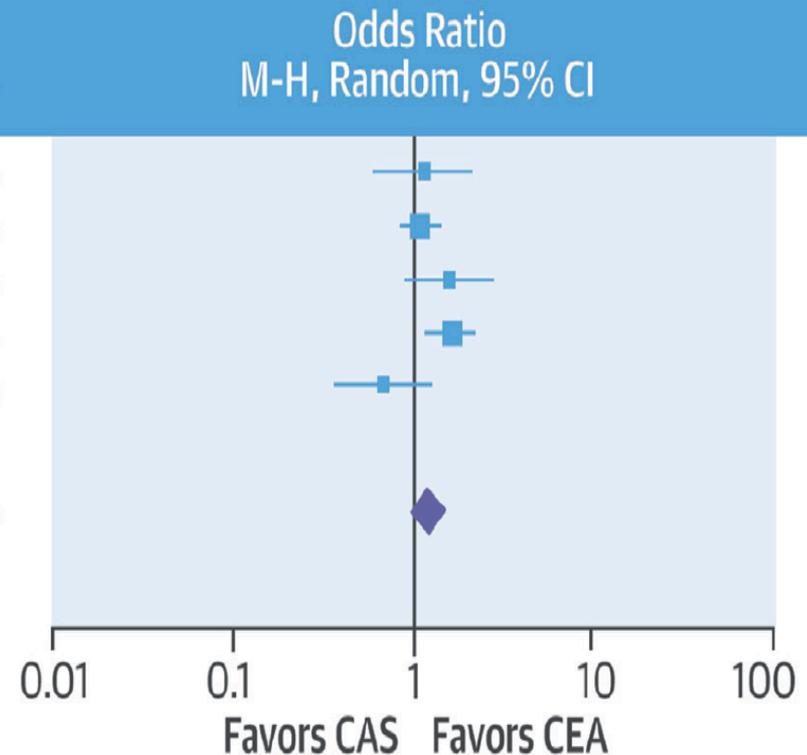
Trials	Total Patients (CAS/CEA)*	Follow-Up Duration (Median yrs)	Recruitment Period	Use of EPD (%)	Asymptomatic Patients (%)
ACT I 2016	1,089/364	5.0	2005-2013	Yes (97.8)	100.0
CREST 2010 and 2016†	1,262/1,240	7.4	2000-2008	Yes (96.1)	47.2
EVA-3S 2006 and 2014	265/262	7.1	2000-2005	Yes (91.9)	0.0
ICSS 2010 and 2015‡	853/857	4.2	2001-2008	Yes (70.7)	0.0
SAPPHIRE 2004 and 2008	167/167	3.0	2000-2002	Yes (95.6)	72.3

end point combinato di morte, infarto, stroke M&M breve e lungo termine

Study or Subgroup	CAS Events	CAS Total	CEA Events	CEA Total	Weight
ACT I 2016	41	1,089	12	364	12.4%
CREST 2016	108	1,262	97	1,240	31.9%
EVA-3S 2014	33	265	22	262	15.2%
ICSS 2015	95	853	62	857	28.0%
SAPPHIRE 2008	18	167	25	167	12.6%
Total (95% CI)		3,636		2,890	100.0%
Total Events	295		218		

Heterogeneity: $\text{Tau}^2 = 0.04$; $\text{Chi}^2 = 6.80$, $\text{df} = 4$ ($P = 0.15$); $I^2 = 41\%$

Test for Overall Effect: $Z = 1.48$ ($P = 0.14$)



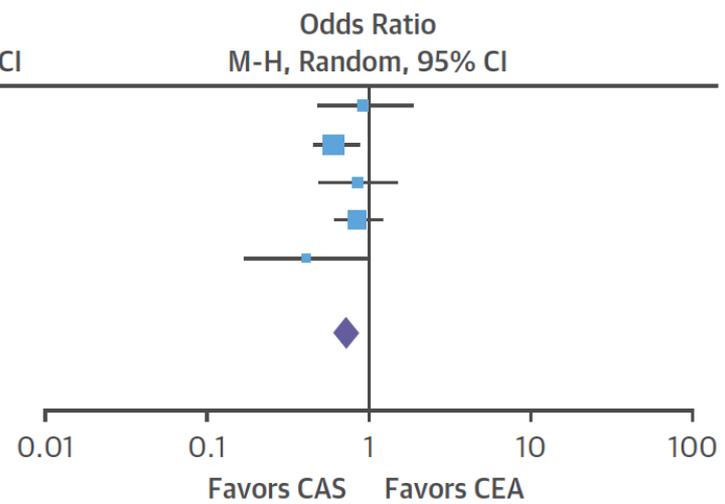
end point combinato di morte, infarto, stroke M&M breve e lungo termine

Outcome of Interest	Number of Events/Patients (Absolute Event Rate, %)		NNT/NNH for CAS	p Value
	CAS Group	CEA Group		
Aggregate efficacy/safety outcome*	295/3,636 (8.1)	218/2,890 (7.5)	–	0.14
Periprocedural any stroke + nonperiprocedural ipsilateral stroke	275/3,636 (7.6)	161/2,890 (5.6)	50 (NNH)	<0.001
Periprocedural any stroke	169/3,636 (4.6)	73/2,890 (2.5)	47 (NNH)	<0.001
Periprocedural minor stroke	124/3,636 (3.4)	44/2,890 (1.5)	52 (NNH)	<0.001
Periprocedural death	26/3,636 (0.7)	16/2,890 (0.5)	–	0.48
Periprocedural MI	24/3,636 (0.6)	48/2,890 (1.6)	99 (NNT)	0.002
Periprocedural CN palsy	9/3,636 (0.2)	135/2,890 (4.7)	22 (NNT)	<0.001
Periprocedural neurological injury	178/3,636 (4.9)	208/2,890 (7.2)	43 (NNT)	0.02
Periprocedural neck hematoma	20/3,469 (0.6)	53/2,723 (1.9)	73 (NNT)	<0.001
Composite periprocedural safety outcome†	224/3,636 (6.2)	263/2,890 (9.1)	34 (NNT)	0.008
Long-term stroke in any territory (includes periprocedural stroke)	305/3,636 (8.4)	200/2,890 (6.9)	68 (NNH)	<0.001
Long-term death	429/3,636 (11.8)	357/2,890 (12.3)	–	0.18

end point combinato di morte, infarto, stroke, paralisi nervo cranico periprocedurale

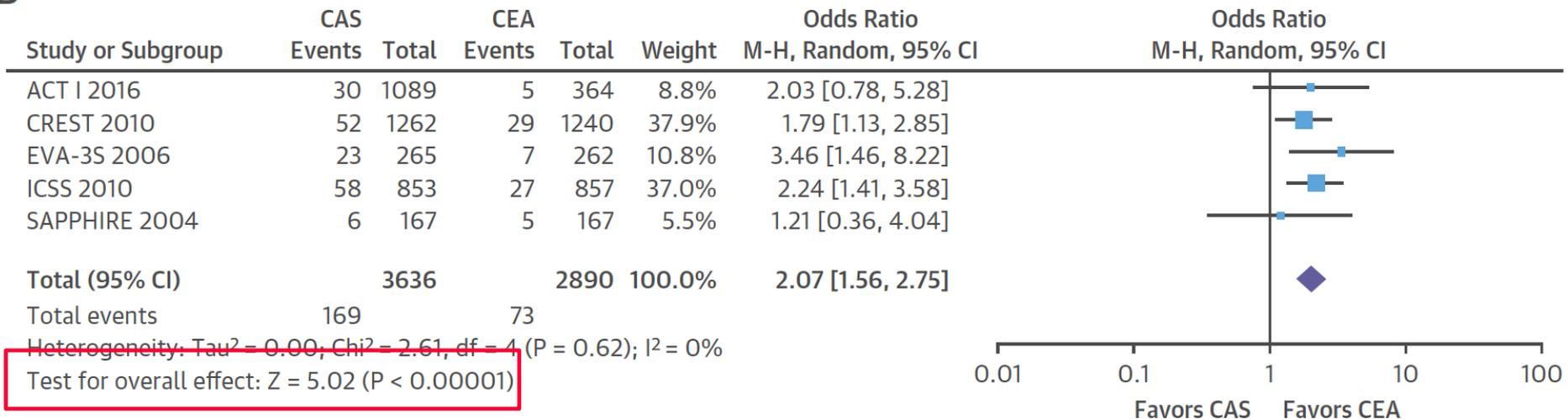
A

Study or Subgroup	CAS		CEA		Weight	Odds Ratio M-H, Random, 95% CI
	Events	Total	Events	Total		
ACT I 2016	37	1089	13	364	10.5%	0.95 [0.50, 1.81]
CREST 2010	79	1262	119	1240	37.4%	0.63 [0.47, 0.85]
EVA-3S 2006	29	265	32	262	14.6%	0.88 [0.52, 1.51]
ICSS 2010	71	853	81	857	31.5%	0.87 [0.62, 1.21]
SAPPHIRE 2004	8	167	18	167	6.1%	0.42 [0.18, 0.99]
Total (95% CI)		3636		2890	100.0%	0.75 [0.60, 0.93]
Total events	224		263			
Heterogeneity: $\tau^2 = 0.01$; $\text{Chi}^2 = 4.76$, $\text{df} = 4$ ($P = 0.31$); $I^2 = 16\%$						
Test for overall effect: $Z = 2.64$ ($P = 0.008$)						



end point di stroke periprocedurale prevalentemente Minor Stroke

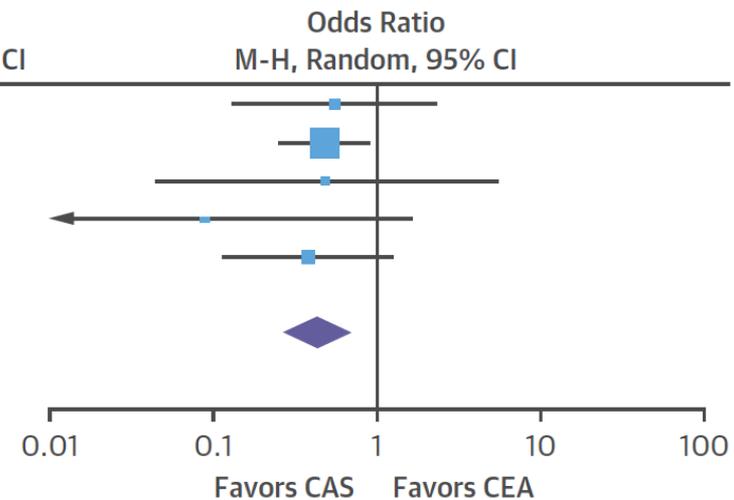
B



end point di infarto miocardico periprocedurale

C

Study or Subgroup	CAS		CEA		Weight	Odds Ratio M-H, Random, 95% CI
	Events	Total	Events	Total		
ACT I 2016	5	1089	3	364	12.5%	0.56 [0.13, 2.33]
CREST 2010	14	1262	28	1240	61.6%	0.49 [0.25, 0.93]
EVA-3S 2006	1	265	2	262	4.4%	0.49 [0.04, 5.46]
ICSS 2010	0	853	5	857	3.1%	0.09 [0.01, 1.64]
SAPPHIRE 2004	4	167	10	167	18.5%	0.39 [0.12, 1.25]
Total (95% CI)		3636		2890	100.0%	0.45 [0.27, 0.75]
Total events	24		48			
Heterogeneity: $\tau^2 = 0.00$; $\chi^2 = 1.41$, $df = 4$ ($P = 0.84$); $I^2 = 0\%$						
Test for overall effect: $Z = 3.09$ ($P = 0.002$)						



TRATTAMENTO DELLA CAROTIDE EXTRACRANICA NELLO STROKE



**RICA
basale**

Marcella F. aa 80 minor stroke
trombolisato
ricorrenza sintomi emisoma sinistro

RICA PRE



**RICA
basale**

PERIPHERAL VASCULAR DISEASE

2016

Original Studies

Feasibility of Carotid Artery Stenting With Double Cerebral Embolic Protection in High-Risk Patients

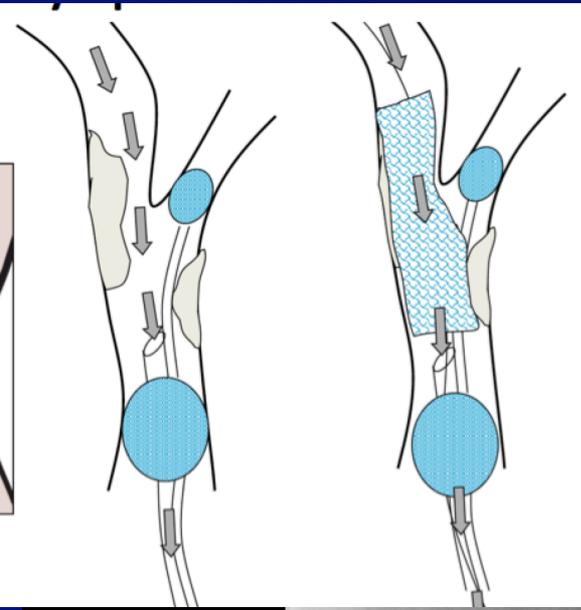
Ferdinando Varbella,^{1*} MD, Andrea Gagnor,¹ MD, Cristina Rolfo,¹ MD, Enrico Cerrato,¹ MD, Mario Bollati,² MD, Paolo Giay Pron,¹ MD, Massimo Hartwig,¹ MD, Sara Palacio Restrepo,¹ MD, Monica Reggiani,³ MD, Salvatore Amarù,³ MD, Emilio Luda di Cortemiglia,³ MD, and Francesco Tomassini,¹ MD

**35 pazienti altissimo rischio
placca carotidea ipoecogena soft con cappuccio sottile
sintomi neurologici (TIAs, Minor stroke)**

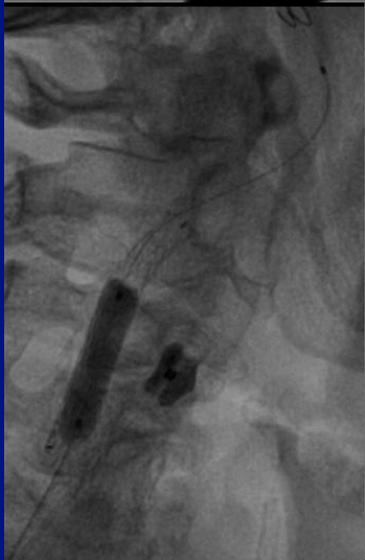
DOPPIO SISTEMA DI PROTEZIONE EMBOLICO

MoMa

Filtro



RICA
basale



RICA
finale



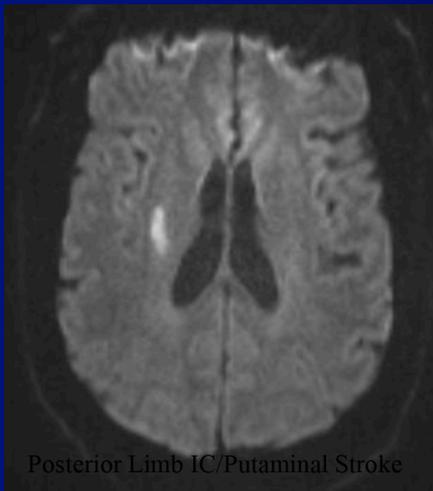
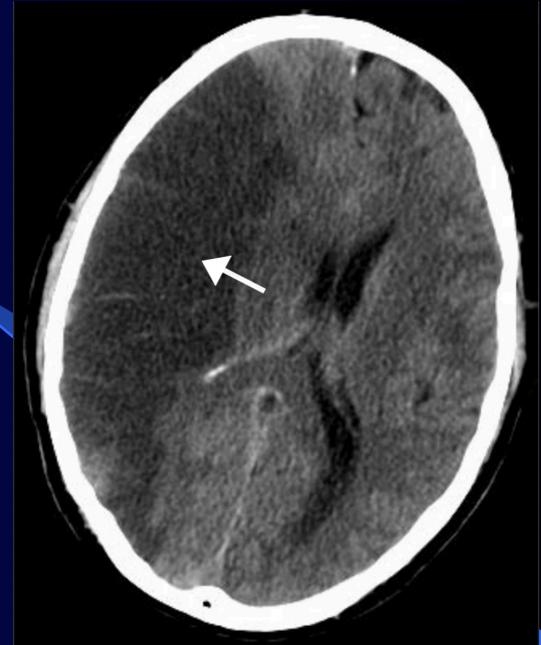
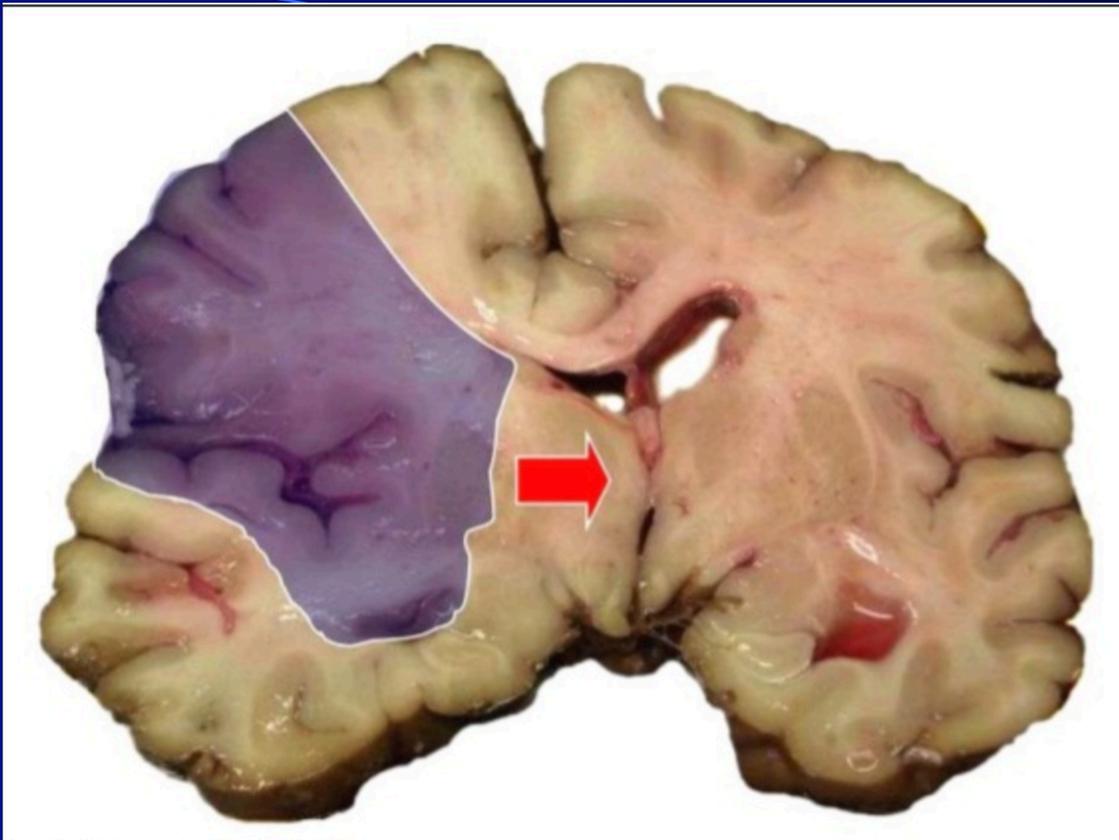
RICA POST

PERCHE' IL CARDIOLOGO ?

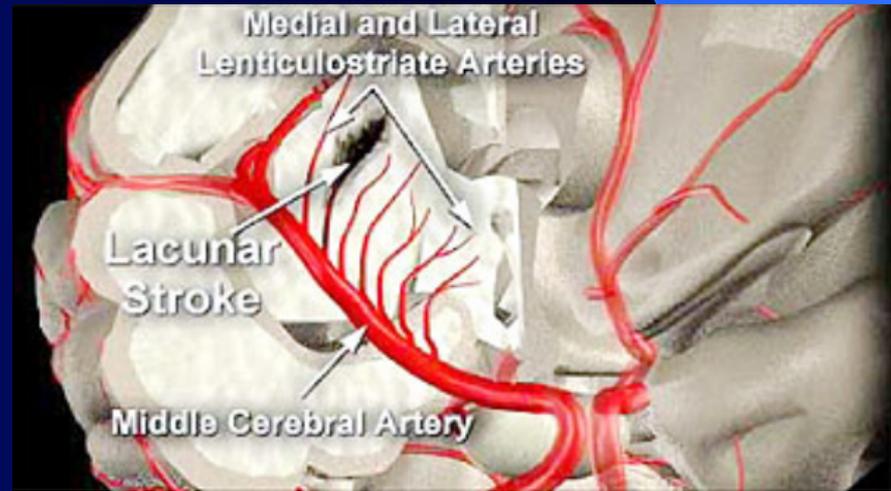
- MANTENIMENTO DEL RITMO SINUSALE
- TERAPIA MEDICA OTTIMALE pressione
colesterolo
- TERAPIA ANTIAGGREGANTE (ASA, Plavix)
- TERAPIA ANTICOAGULANTE (NAO)
- TRATTAMENTO CAROTIDE EXTRACRANICA
- TRATTAMENTO DELLO STROKE ACUTO

TRATTAMENTO DELLO STROKE ACUTO

- mannitolo decadron +
"RIABILITAZIONE" anni '80-90
- "PREVENZIONE" anni 90-2000 TAO
NAO mantenimento ritmo sinusale
- "TRATTAMENTO" anni 2000-10
fibrinolisi trombectomia



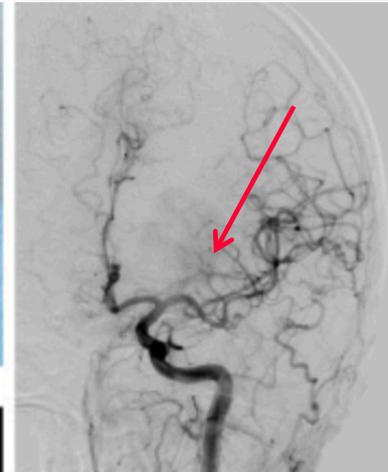
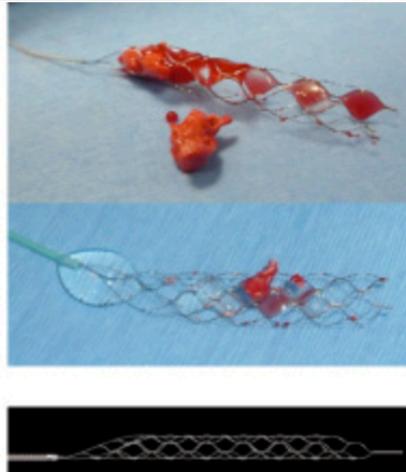
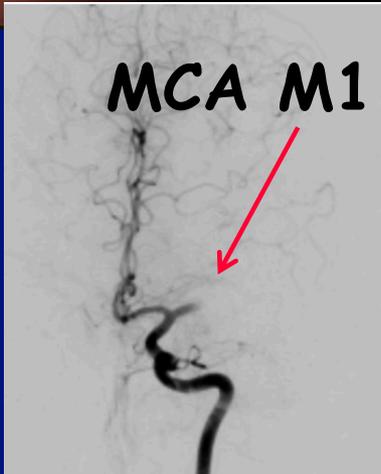
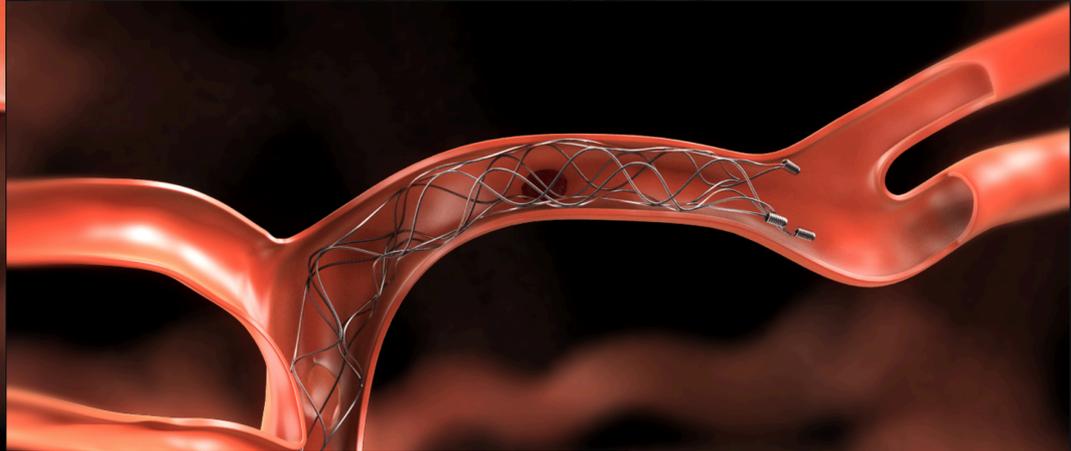
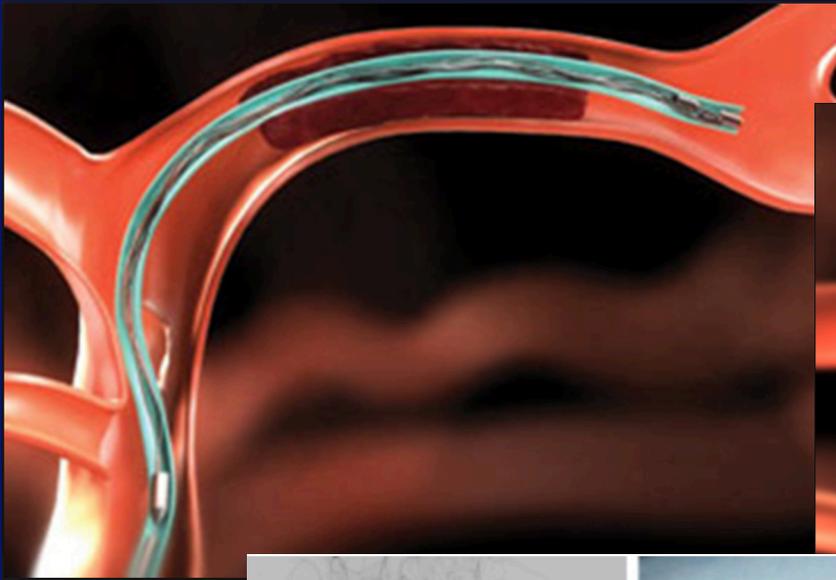
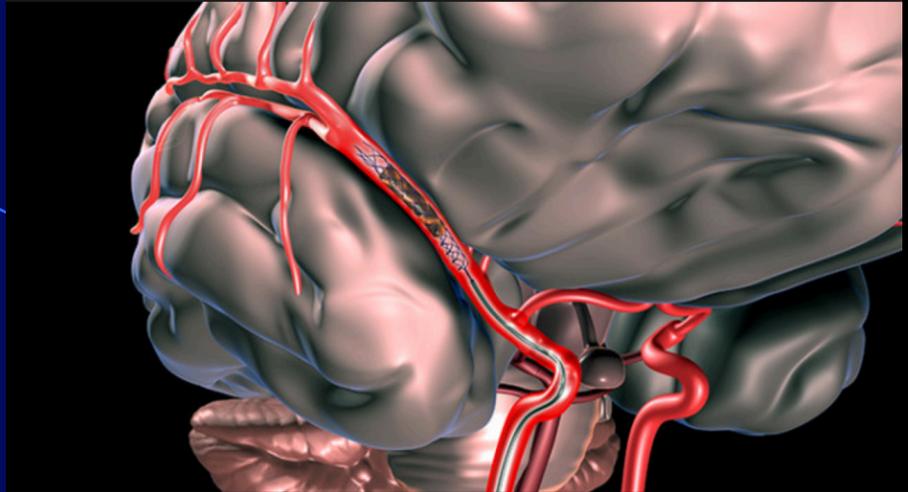
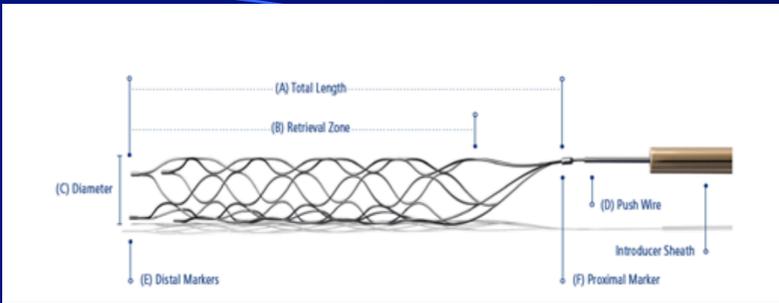
Posterior Limb IC/Putaminal Stroke



Medial and Lateral Lenticulostriate Arteries

Lacunar Stroke

Middle Cerebral Artery



ORIGINAL ARTICLE

Randomized Assessment of Rapid Endovascular Treatment of Ischemic Stroke

ORIGINAL ARTICLE

Endovascular Therapy for Ischemic Stroke with Perfusion-Imaging Selection

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 JANUARY 1, 2015 VOL. 372 NO. 1

A Randomized Trial of Intraarterial Treatment for Acute Ischemic Stroke

ORIGINAL ARTICLE

A Trial of Imaging Selection and Endovascular Treatment for Ischemic Stroke

ORIGINAL ARTICLE

Thrombectomy within 8 Hours after Symptom Onset in Ischemic Stroke

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 JUNE 11, 2015 VOL. 372 NO. 24

Stent-Retriever Thrombectomy after Intravenous t-PA vs. t-PA Alone in Stroke

ESCAPE (fino a 12 ore)

EXTEND-IA (4.5 ore)

MR CLEAN (6 ore)

MR RESCUE (8 ore)

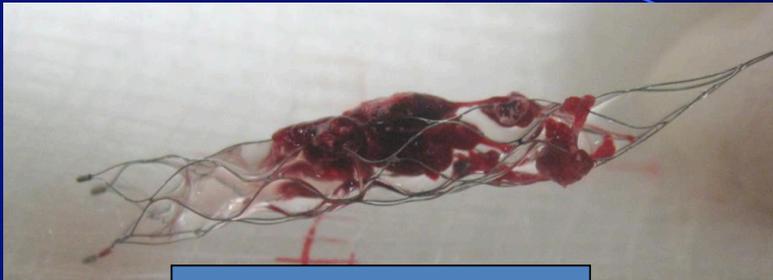
REVASCAT (8 ore)

SWIFT-PRIME (6 ore)

a differenza dello STEMI dopo aver rimosso il trombo
non c'è placca (non necessario stent)



RETRIEVABLE STENT O STENTRIEVER



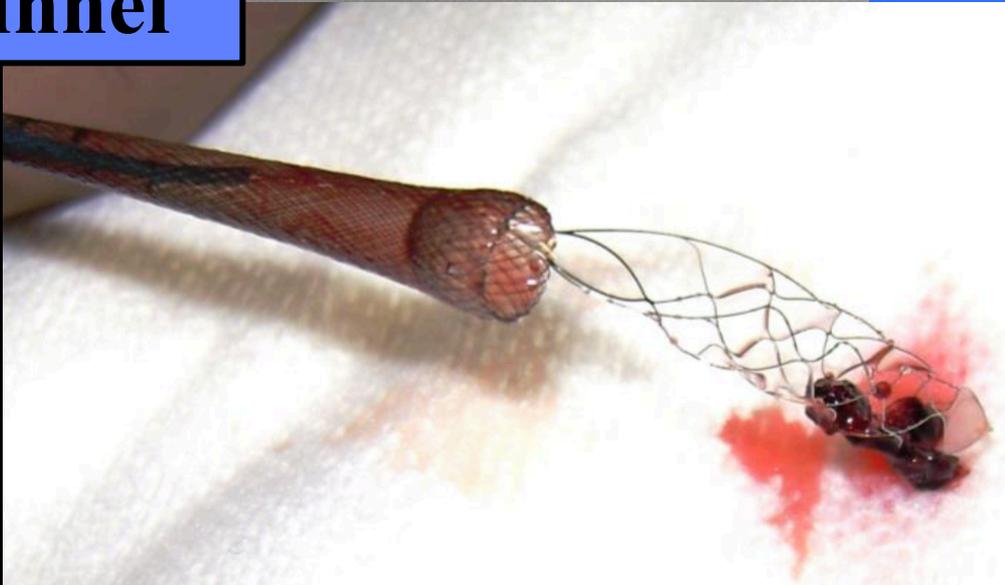
Solitaire



ReCover



Funnel



Intravenous thrombolysis or endovascular therapy for acute ischemic stroke associated with cervical internal carotid artery occlusion: the ICARO-3 study.

Paciaroni M¹, Inzitari D, Agnelli G, Caso V, Balucani C, Grotta JC, Sarraj A, Sung-II S, Chamorro A, Urra X, Leys D, Henon H, Cordonnier C, Dequatre N, Aguetaz P, Alberti A, Venti M, Acciarresi M, D'Amore C, Zini A, Vallone S, Dell'Acqua ML, Menetti F, Nencini P, Mangiafico S, Barlinn K, Kepplinger J, Bodechtel U, Gerber J, Bovi P, Cappellari M, Linfante I, Dabus G, Marcheselli S, Pezzini A, Padovani A, Alexandrov AV, Shahripour RB, Sessa M, Giacalone G, Silvestrelli G, Lanari A, Ciccone A, De Vito A, Azzini C, Saletti A, Fainardi E, Orlandi G, Chiti A, Gialdini G, Silvestrini M, Ferrarese C, Beretta S, Tassi R, Martini G, Tsigoulis G, Vasdekis SN, Consoli D, Baldi A, D'Anna S, Luda E, Varbella F, Galletti G, Invernizzi P, Donati E, De Lodovici ML, Bono G, Corea F, Sette MD, Monaco S, Riva M, Tassinari T, Scoditti U, Toni D.

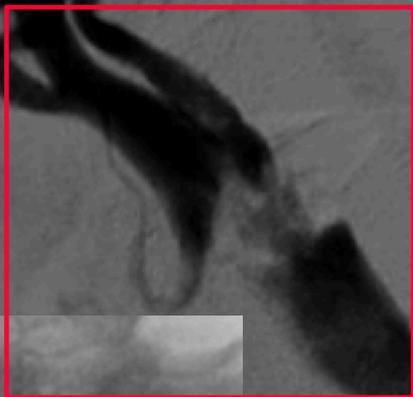
**Germano G. anni 71 emiplegia dx
afasia, alteplase inefficace**

LICA PRE



BASALE

FINALE



LICA POST

ANGIO 3
MESI





MEDICO URGENZA

NEUROLOGO
stroke UNIT

RADIOLOGO
neuroradiologo



INTERVENTISTA
CARDIOVASCOLARE

NEUROLOGO E
CARDIOLOGO STROKE
UNIT/UTIC



GRAZIE PER L'ATTENZIONE