31 GIORNATE CARDIOLOGICHE TORINESI

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2019

Carotid screening for coronary artery disease and vice-versa, add value or added risks ?

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Humanitas Gavazzeni Bergamo

Italy

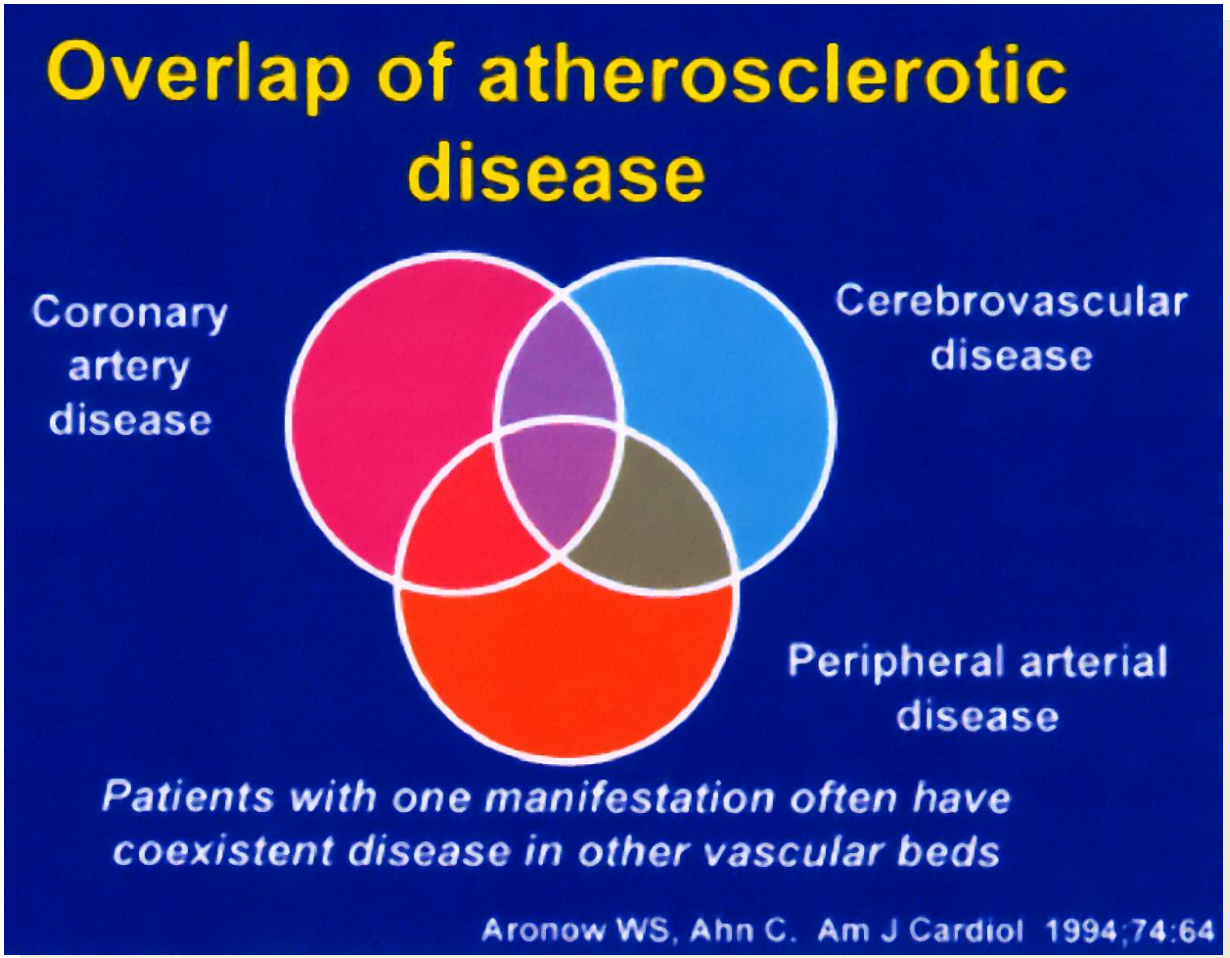
Potential conflicts of interest

Speaker's name: Fausto Castriota

☑ **I have the following potential conflicts of interest to report:**

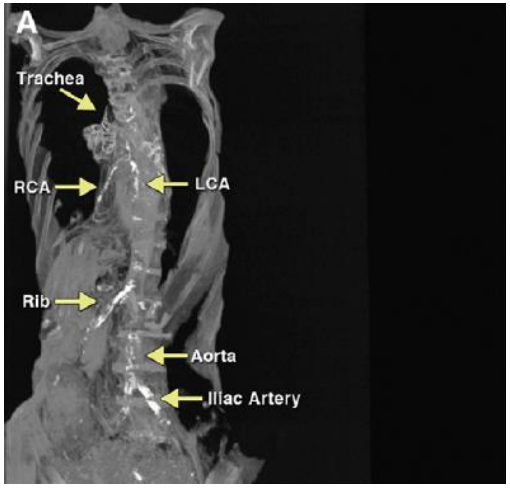
Consultant Institutional grant/research support/ proctor :
ABBOTT VASCULAR, MEDTRONIC, TERUMO, BOSTON SCIENTIFIC

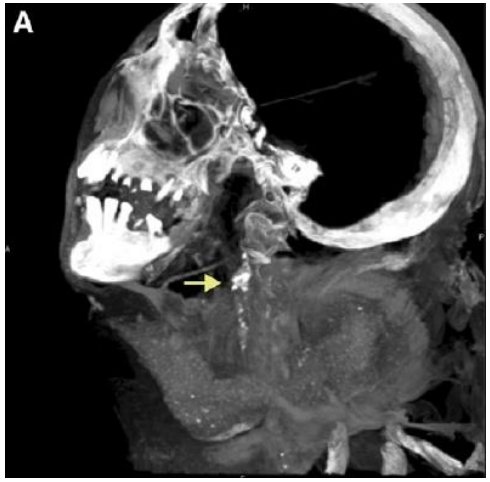
Background

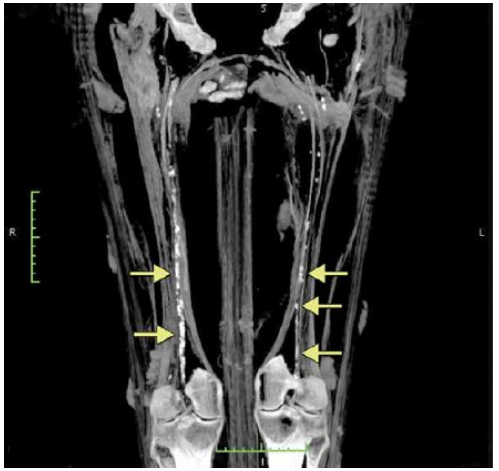

Overlap of atherosclerotic disease
Coronary artery disease
Cerebrovascular disease
Peripheral arterial disease
Patients with one manifestation often have coexistent disease in other vascular beds
Aronow WS, Ahn C. Am J Cardiol 1994;74:64

♀ 45 anni.
Stretta aderenza alla dieta mediterranea, astinenza da fumo, grassi saturi e zuccheri.
Stile di vita tranquillo, non stressante.

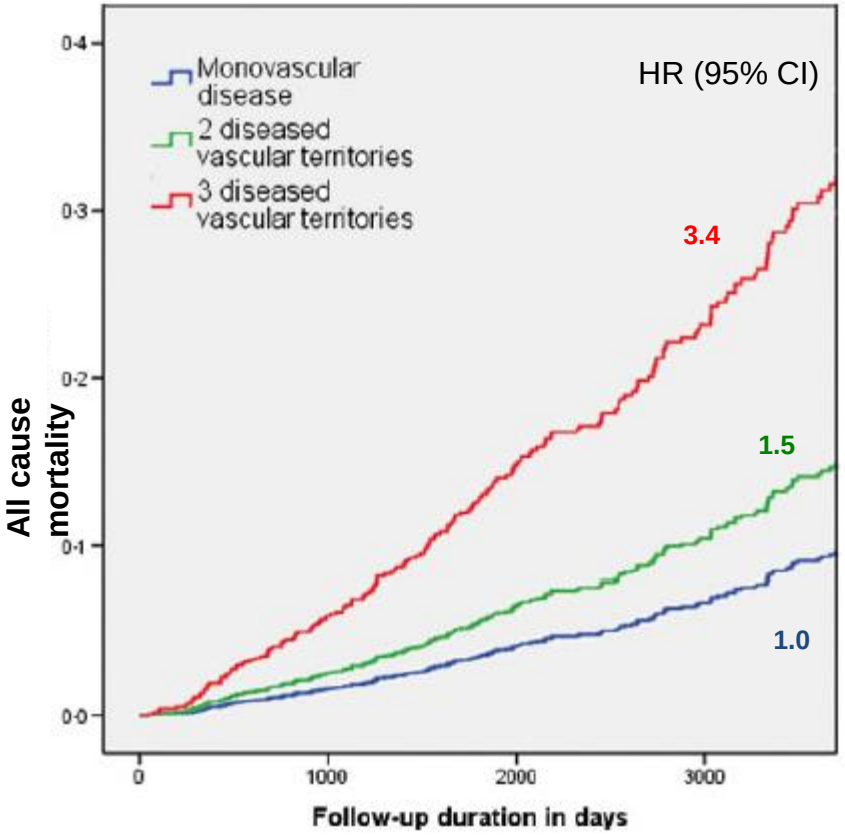
Ahmose-Meryet-Amon
Principessa Egiziana vissuta tra il 1580 e il 1530 a.C.

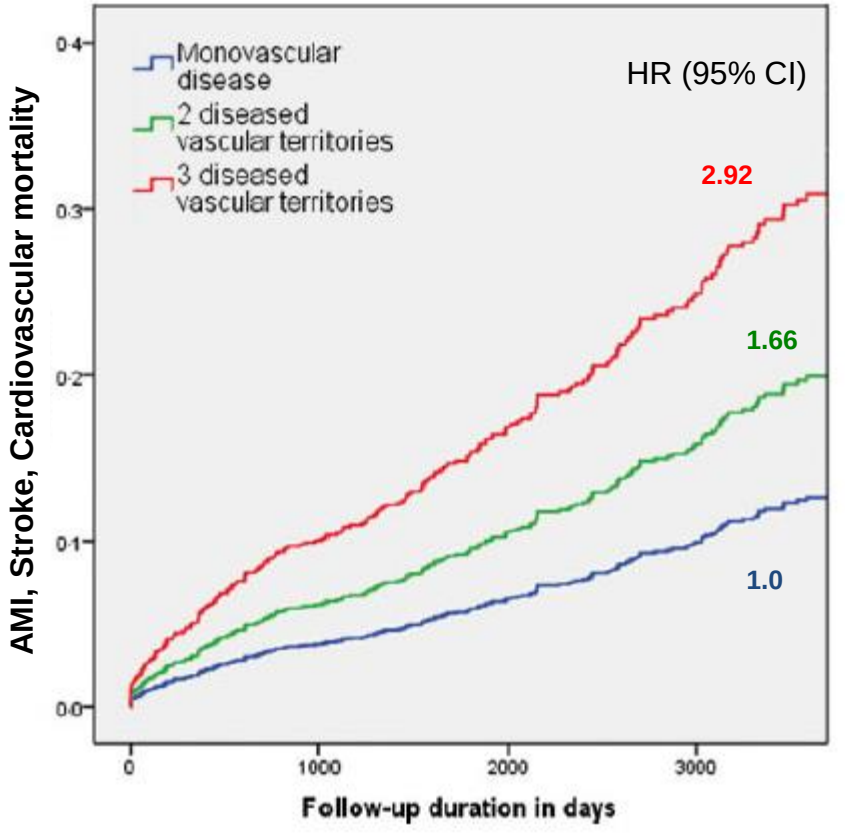






Aterosclerosi Multidistrettuale: PROGNOSI





Territories evaluated: cerebrovascular disease, peripheral arterial disease, abdominal aortic aneurism, vascular renal disease

G van der Meer, Eur J Clin Inv 2014; 44 (3): 231-239

Coronary and Carotid

- **In patients with severe coronary artery disease referred for cardiac surgery:**
  - **15 to 25% have carotid stenosis >50%,**
  - **5 to 15% have stenosis >80%.**
- **Such percentages may range from 5% in subjects with a single coronary artery stenosis, to 25% in patients with three-vessel coronary artery disease, up to 40% in patients with a severe lesion of the left main trunk [1].**

1) Eagle K, Guyton R, Davidoff R et al. ACC/AHA 2004 Guideline update for coronary artery bypass graft surgery: summary article. J Am Coll Caridol 2004; 2004; 44: 1146-1154
2) Simons PG, Algra A, Eikelboon BC, et al. Carotid artery stenosis in patients with peripheral artery disease. The SMART study. J Vasc Surg 1999; 30: 519-525
3) House AK, Bell R, House J, et al. Asymptomatic carotid artery stenosis associated with peripheral artery disease: a prospective study. Cardiovasc Surg 1999; 7: 44-49

MULTISITE ARTERY DISEASE

DEFINITION: simultaneous presence of clinically relevant atherosclerotic lesions in at least two major vascular territories

PREVALENCE: higher than expected and probably underdiagnosed; increases in parallel with life expectancy

PROGNOSIS: poorer prognosis

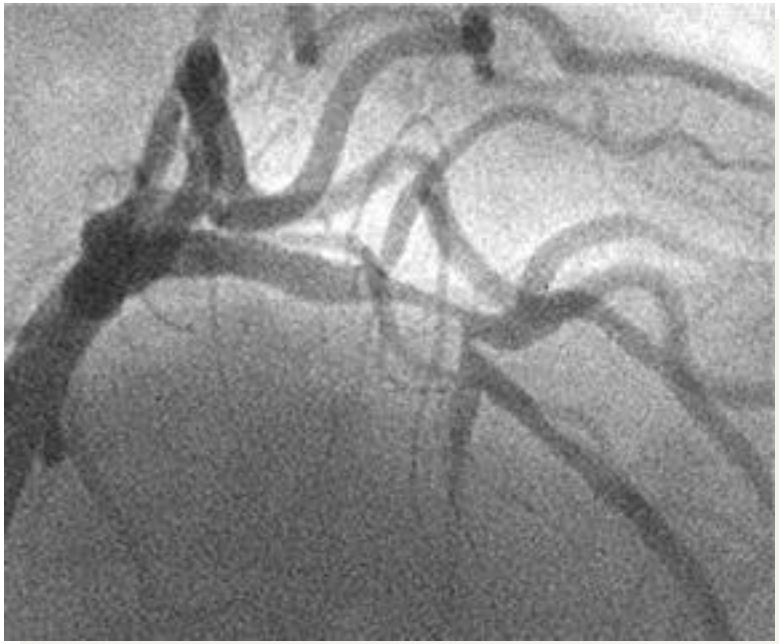
BUT..

NO RANDOMIZED TRIALS HAVE BEEN DESIGNED TO COMPARE DIFFERENT TREATMENT STRATEGIES

CONSEQUENTLY...

TREATMENT STRATEGY SHOULD BE CHOSEN INDIVIDUALLY, CONSIDERING THE OVERALL CLINICAL STATUS OF THE PATIENT, TAKING INTO ACCOUNT THE PRESENCE OF CARDIOVASCULAR RISK FACTORS AND CO-MORBIDITIES

Patients with combined carotid and coronary artery disease



What we need to know about…..

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2017 ESC Guidelines on the Diagnosis and Treatment of Peripheral Arterial Diseases, in collaboration with the European Society for Vascular Surgery (ESVS)

ESC European Society of Cardiology

Recommendations on screening for carotid disease in patients undergoing coronary artery bypass grafting

Recommendations	Class[a]	Level[b]
In patients undergoing CABG, DUS is recommended in patients with a recent (<6 months) history of TIA/stroke.[345,358]	I	B
In patients with no recent (<6 months) history of TIA/stroke, DUS may be considered in the following cases: age ≥70 years, multivessel coronary artery disease, concomitant LEAD or carotid bruit.[345,358]	IIb	B
Screening for carotid stenosis is not indicated in patients requiring urgent CABG with no recent stroke/TIA.	III	C

CABG = coronary artery bypass grafting; DUS = duplex ultrasound; LEAD = lower extremity artery disease; TIA = transient ischaemic attack.
[a]Class of recommendation.
[b]Level of evidence.

Recommendations on the management of carotid stenosis in patients undergoing coronary artery bypass grafting

Recommendations	Class[a]	Level[b]
It is recommended that the indication (and, if so, the method and timing) for carotid revascularization be individualized after discussion within a multidisciplinary team, including a neurologist.	I	C
In patients with a recent (<6 months) history of TIA/stroke who are scheduled for CABG:		
• Carotid revascularization should be considered in patients with 50–99% carotid stenosis.[359,360]	IIa	B
• Carotid revascularization with CEA should be considered as the first choice in patients with 50–99% carotid stenosis.[359,360]		
• Carotid revascularization is not recommended in patients with carotid stenosis <50%.	III	C
In neurologically asymptomatic patients scheduled for CABG:		
• Routine prophylactic carotid revascularization in patients with a 70–99% carotid stenosis is not recommended.[350]	III	B
• Carotid revascularization may be considered in patients with bilateral 70–99% carotid stenoses or 70–99% carotid stenosis + contralateral occlusion.[350]	IIb	B
• Carotid revascularization may be considered in patients with a 70–99% carotid stenosis in the presence of one or more characteristics that may be associated with an increased risk of ipsilateral stroke[c] in order to reduce stroke risk beyond the perioperative period.	IIb	C

CABG = coronary artery bypass grafting; CAS = carotid artery stenting; CEA = carotid endarterectomy.
[a]Class of recommendation.
[b]Level of evidence.
[c]See *Table 4*.

2017 ESC Guidelines on the Diagnosis and Treatment of Peripheral Arterial Diseases, in collaboration with the European Society for Vascular Surgery (ESVS)

ESC
European Society of Cardiology

Recommendation on screening for coronary artery disease in patients with carotid disease

	Class[a]	Level[b]
In patients undergoing elective CEA, preoperative CAD screening, including coronary angiography, may be considered.[382,383]	IIb	B

CAD = coronary artery disease; CEA = carotid endarterectomy.
[a]Class of recommendation.
[b]Level of evidence.

2017 ESC Guidelines on the Diagnosis and Treatment of Peripheral Arterial Diseases, in collaboration with the European Society for Vascular Surgery (ESVS)

ESC
European Society of Cardiology

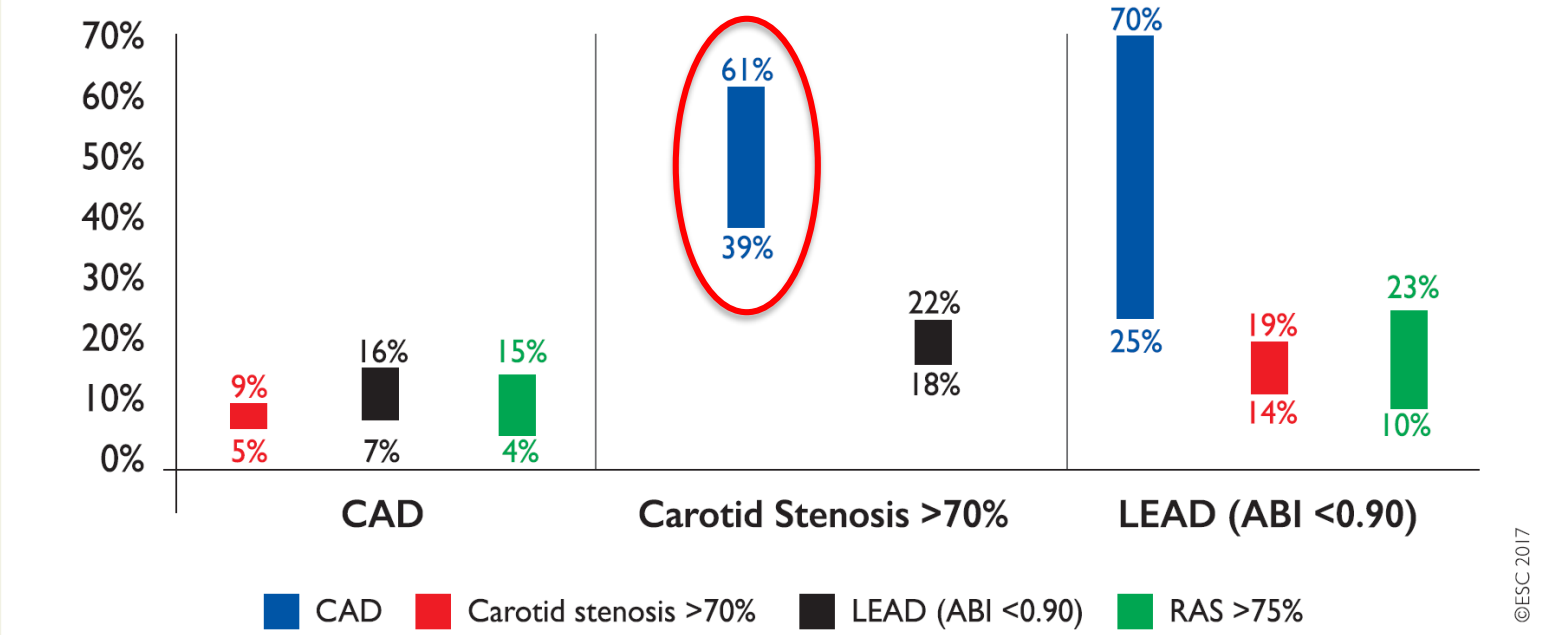
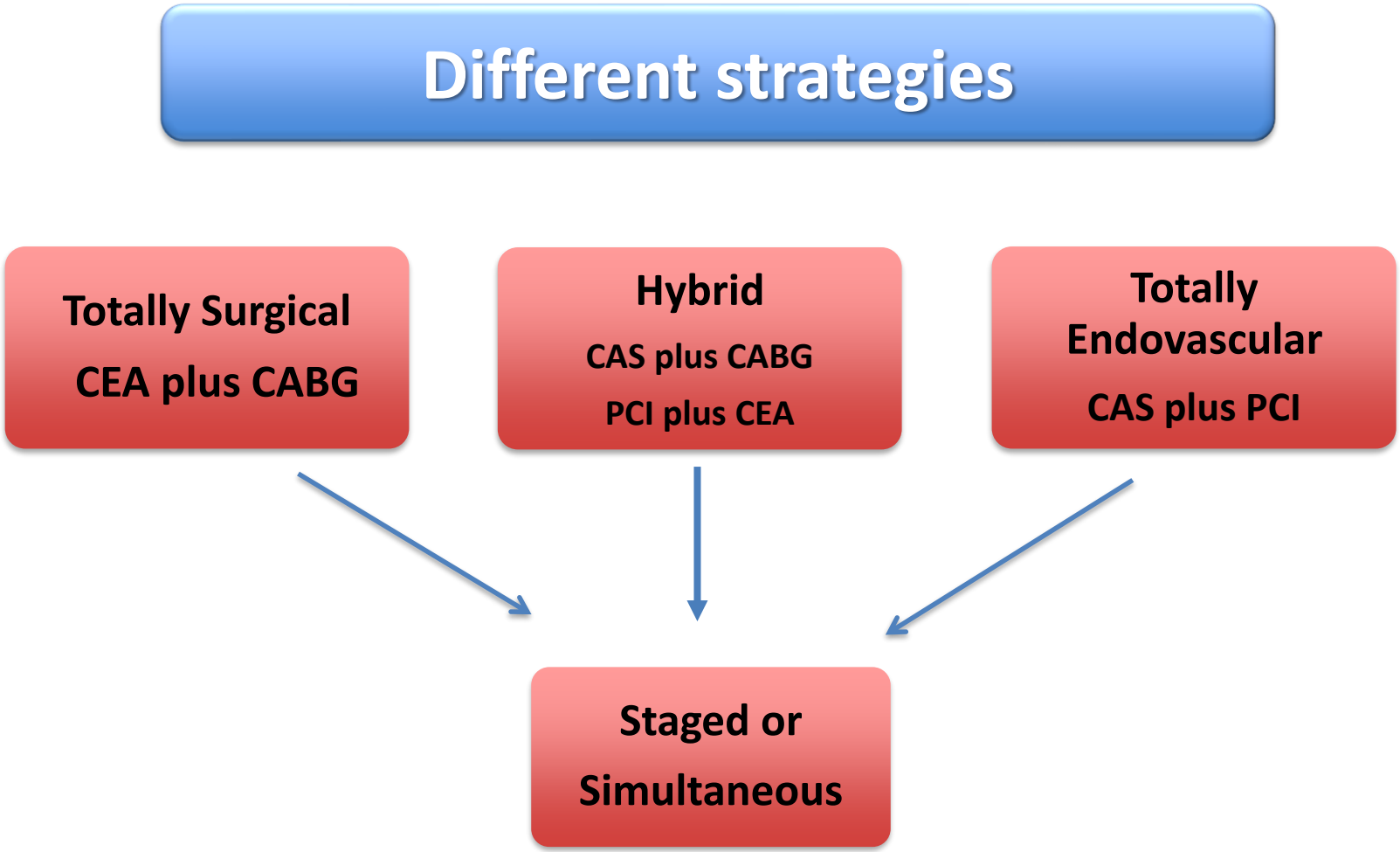


Figure 8 Reported rate ranges of other localizations of atherosclerosis in patients with a specific arterial disease.[51, 335–343] The graph reports the rates of concomitant arterial diseases in patients presenting an arterial disease in one territory (e.g. in patients with CAD, 5 - 9% of cases have concomitant carotid stenosis >70%). ABI = ankle-brachial index; CAD = coronary artery disease; LEAD = lower extremity artery disease; RAS = renal artery stenosis.

Combined carotid and coronary artery disease in need of treatment……



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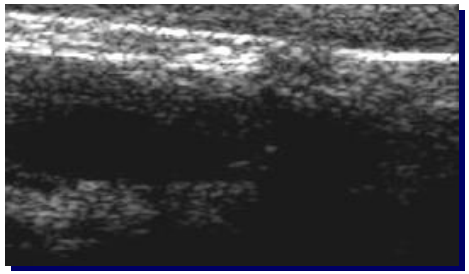
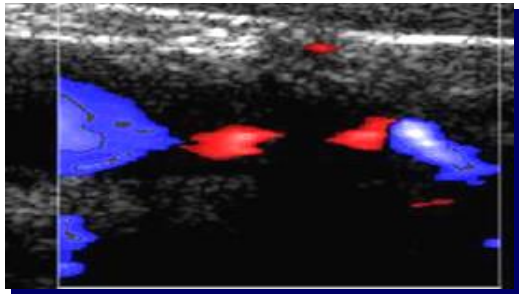
Patients with combined carotid and coronary artery disease

Severe, soft lesion; very tortuous ICA

First Clinical Presentation:
recurrent TIAs..





Echo-Doppler evaluation:
Carotid anechoic plaque with GSM < 25

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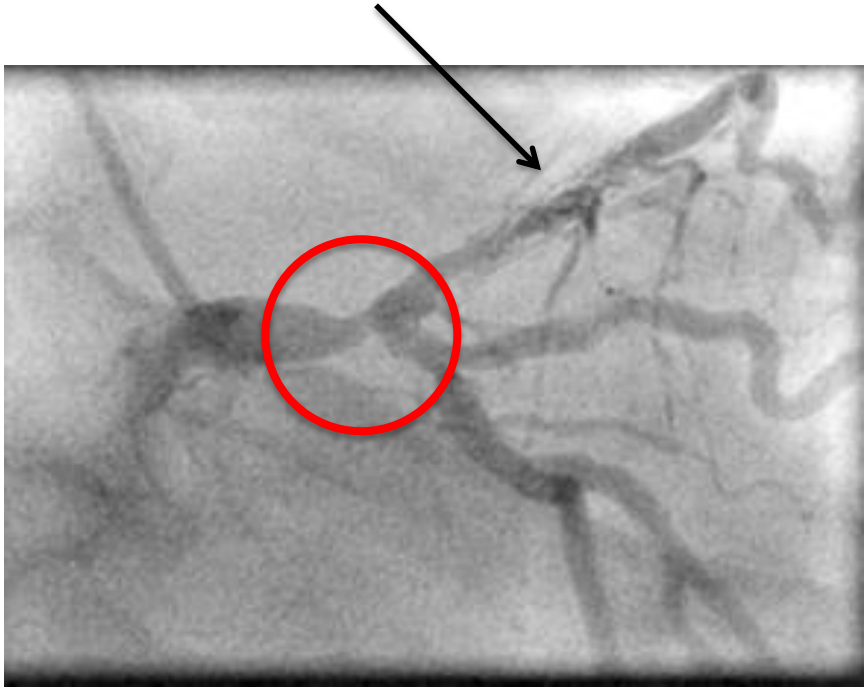
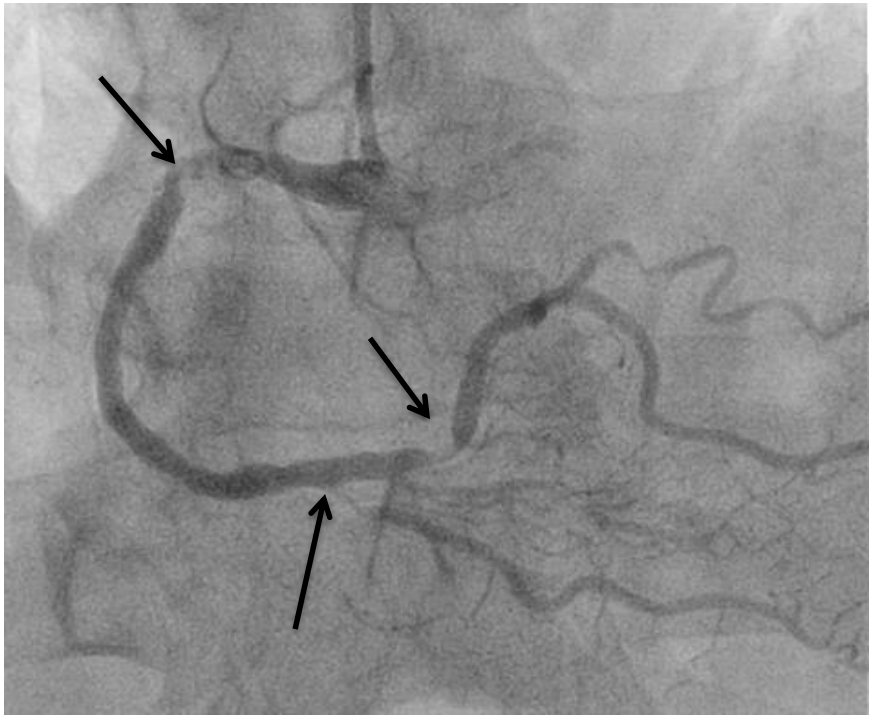
Multiple CV risk factors; Diabetes; Previous PCI LAD\ACS; Stable Angina

Critical distal left main stenosis
LAD in stent restenosis





Multiple lesions of Right Coronary

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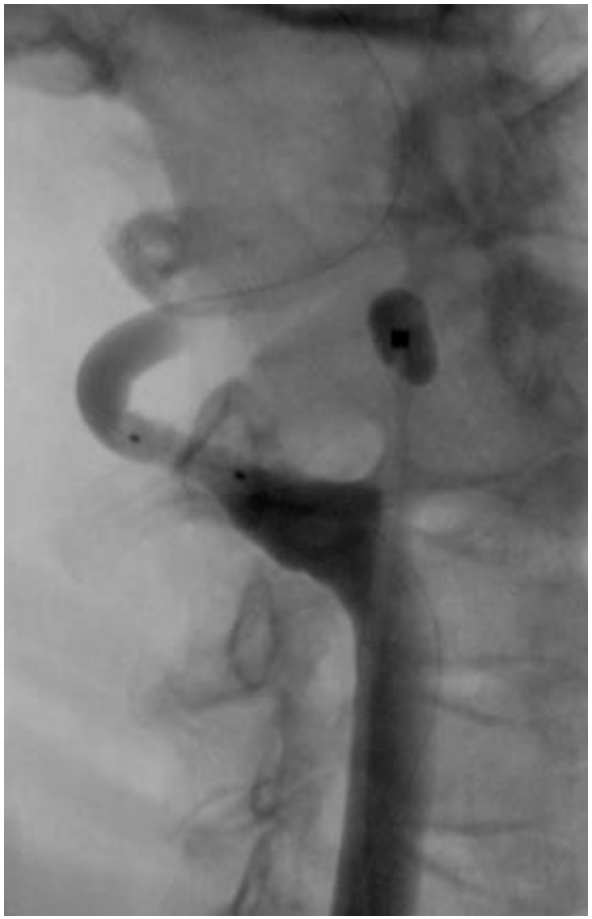
Hybrid staged treatment: first step CAS

- Inflation of Distal Balloon
- ECA



- Inflation of Proximal Balloon
- Pre-Dilatation under flow blockage

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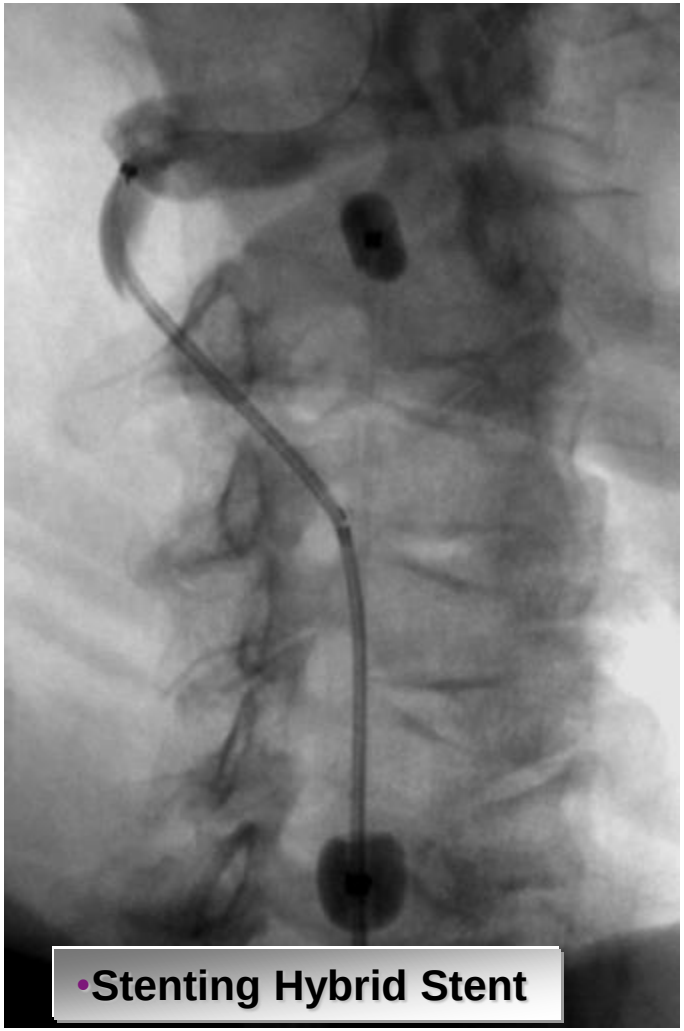
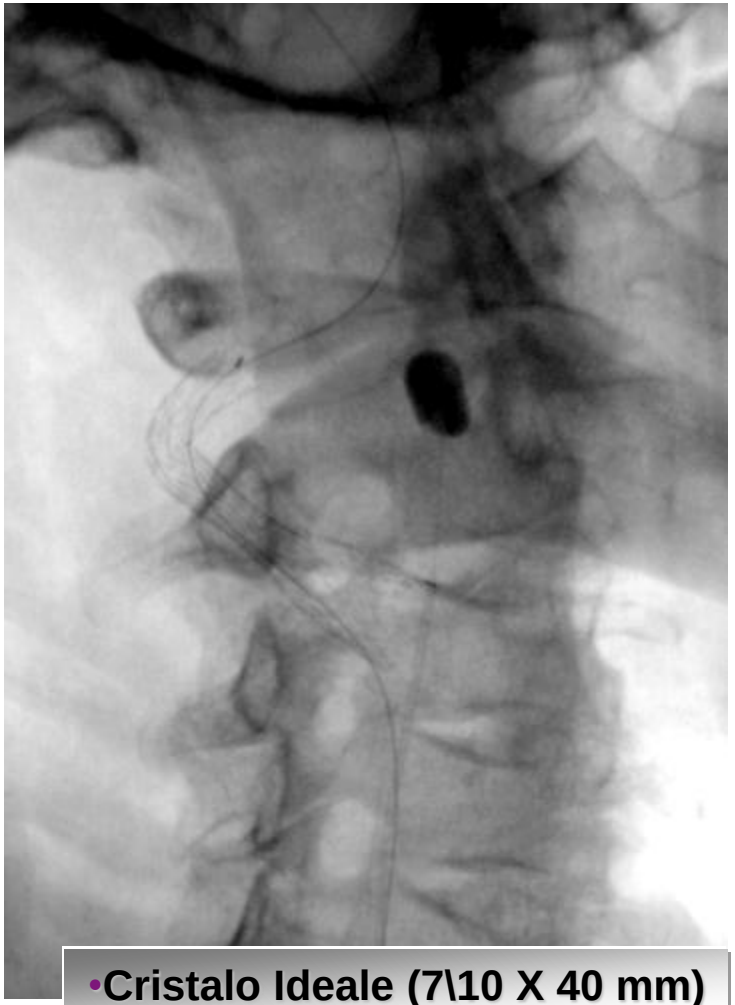
Hybrid staged treatment: first step CAS



- Stenting Hybrid Stent



- Cristalo Ideale (7\10 X 40 mm)

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Hybrid staged treatment: first step CAS

•Post Dilatation (5.5\20 mm Balloon)

•Final Result

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Hybrid staged treatment: second step CABG

3 weeks later “off pump” CABG

- **LIMA on LAD**
- **Saphenous vein graft on marginal branch, distal Right Coronary and PDA.**

Clopdidogrel was discontinued 5 days before surgery, after a ultrasound evaluation showing a good flow inside the stent

Patient discharge after 9 days without complications

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EuroIntervention

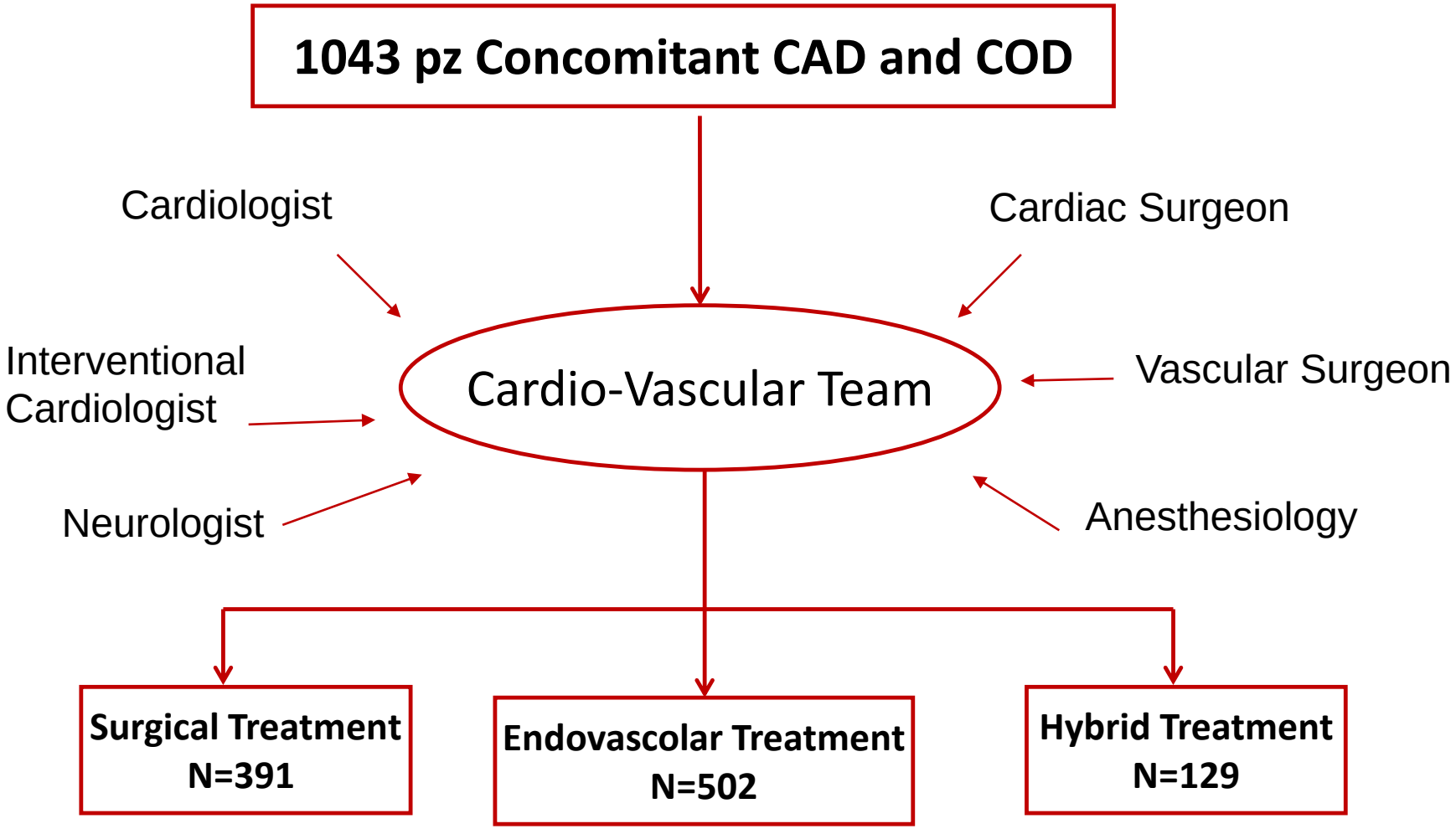
The Best Strategy ??????

The gap between vascular interventions and vascular medicine

Flavio Ribichini[1]*, MD; Fabrizio Tomai[2], MD; Fausto Castriota[3], MD; Paolo Russo[4], MD; Bernhard Reimers[5], MD; for the Finalised Research In ENDovascular Strategies (FRIENDS) study group

1. Department of Medicine, University of Verona, Verona, Italy; 2. Department of Cardiovascular Sciences, European Hospital, Rome, Italy; 3. Cardiovascular Unit, GVM Care and Research Villa Maria Cecilia Hospital, Cotignola, Italy; 4. GVM Care and Research Cardiovascular Unit, Villa Maria Pia Hospital, Turin, Italy; 5. Division of Cardiology Ospedale Civile, Mirano, Italy

The **FRIENDS** Study……



EuroIntervention

Clinical outcome after endovascular, surgical or hybrid revascularisation in patients with combined carotid and coronary artery disease: the Finalised Research In ENDovascular Strategies Study Group (FRIENDS)

Flavio Ribichini[1], MD; Fabrizio Tomai[2], MD; Bernhard Reimers[3],MD; Paolo Russo[4], MD; Raoul Borioni[2], MD; Daniela Spartà[1], MD; Andrea Pacchioni[3], MD; Gabriele Pesarini[1], MD; Barbara Spagnolo[5], MD; Giovanni De Persio[2], MD ; Alberto Cremonesi[5], MD; Fausto Castriota[5], MD

Early and Long-Term Outcomes After Combined Percutaneous Revascularization in Patients With Carotid and Coronary Artery Stenoses

Fabrizio Tomai, MD,* Gabriele Pesarini, MD,† Fausto Castriota, MD,‡
Bernhard Reimers, MD,§ Leonardo De Luca, MD, PHD,* Giovanni De Persio, MD,*
Daniela Spartà, MD,† Cristina Aurigemma, MD,* Andrea Pacchioni, MD,§
Barbara Spagnolo, MD,‡ Alberto Cremonesi, MD,‡ Flavio Ribichini, MD,†
for the FRIENDS (Finalized Research in Endovascular Strategies) Study Group

JACC: CARDIOVASCULAR INTERVENTIONS, VOL. 4, NO. 5, 2011
MAY 2011:560–8

The FRIENDS Study

European Heart Journal Supplements (2015) **17** (Supplement A), A23–A28
The Heart of the Matter
doi:10.1093/eurheartj/suv008

EUROPEAN SOCIETY OF CARDIOLOGY®

Early and late clinical outcomes of endovascular, surgical, and hybrid revascularization strategies of combined carotid and coronary artery diseases: the FRIENDS study group (Finalized Research In ENDovascular Strategies)

Fausto Castriota[1]*, Fabrizio Tomai[2], Gioel Gabrio Secco[1], Bernhard Reimers[3], Anna Piccoli[4], Giovanni De Persio[2], Gabriele Pesarini[4], Giulia Schiavina[5], Raoul Borioni[2], Andrea Pacchioni[3], Alberto Cremonesi[1], Corrado Vassanelli[4], and Flavio Ribichini[4]

[1]*Cardiovascular Unit, Maria Cecilia Hospital, GVM Care & Research, via Corriera 1, Cotignola, RA 48010, Italy*
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[4]*Department of Medicine, University of Verona, Verona, Italy*
[5]*Clinical Research Unit, E.S. Health Science Foundation, Cotignola, Italy*

FRIENDS Study : CLINICAL PRESENTATION

CARDIOVASCULAR DISEASE	862 (82.6%)
Acute	227 (21.7%)
NSTEMI	124 (11.8%)
Unstable Angina	88 (8.4%)
STEMI	15 (1.4%)
Chronic	635 (60.8%)
Stable Angina	561 (53.7%)
Indication to CABG	6 (0.5%)
Others *	68 (6.5%)
NEUROLOGICAL DISEASE	181 (17.3%)
Acute	23 (2.2%)
TIA	10 (0.9%)
Stroke	13 (1.2%)
Chronic	158 (15.1%)
Symptomatic	84 (8.0%)
Asymptomatic (elective PTA)	74 (7.0%)

* : valvular heart disease, cardiomyopathy, heart failure of unknown cause, major arrhythmias.

FRIENDS Study : BASELINE CLINICAL CHARACTERISTICS

	Surgical n=391	Endovascular n=502	Hybrid n=129	*p1*	*p2*
Age years±SD	70.8±8.6	73.1±8.0	71.5±8.1	<0.001	<0.001
Male Gender	296 (75.7%)	367 (73.1%)	90 (69.8%)	ns	ns
Hypertension	341 (87.2%)	442 (88.0%)	107 (82.9%)	ns	ns
Diabetes	168 (43.0%)	168 (33.5%)	46 (35.7%)	<0.01	ns
CRF	118 (30.3%)	112 (22.4%)	24 (18.4%)	<0.01	ns
LVEF	56.1±8.0	54.1±8.6	51.3±8.9	<0.001	<0.001
Bilateral COD	30 (7.7%)	97 (19.4%)	42 (32.9%)	<0.001	<0.001
Multivessel CAD	264 (67.5%)	235 (46.8%)	89 (69.0%)	<0.001	<0.001
Diagnosis ACS	77 (19.7%)	110 (21.9%)	36 (27.9%)	ns	ns
Neurological Symptoms	63 (16.1%)	86 (17.2%)	43 (33.3%)	ns	<0.001

FRIENDS Study : PERIPROCEDURAL EVENTS

	SURGICAL n=391	ENDOVASCULAR n=502	HYBRID n=129	P1	P2
Cardiovascular Death	9 (2.3%)	1 (0.2%)	0 (0%)	<0.001	0.82
AMI	2 (0.5%)	5 (0.9%)	2 (1.6%)	0.47	0.57
Stroke	2 (0.5%)	10 (2.0%)	1 (0.8%)	0.03	0.30
Major Bleedings	15 (3.8%)	28 (5.5%)	18 (13.9%)	0.33	0.001

FRIENDS Study : Events at 1-year follow-up and primary end point in the three groups (hierarchical)

	SURGICAL n=391	ENDOVASCULAR n=502	HYBRID n=129	P1	P2
Cardiovascular Death	14 (3.6%)	8 (1.6%)	3 (2.3%)	0.05	0.63
Non Cardiovascular Death	3 (0.8%)	5 (1.0%)	1 (0.8%)	0.7	0.8
AMI	4 (1.0%)	10 (2.0%)	2 (1.6%)	0.2	0.7
Stroke	2 (0.5%)	10 (2.0%)	1 (0.8%)	0.03	0.2
EPP (Death, AMI, Stroke)	23 (5.8%)	33 (6.5%)	6(4.6%)	0.6	0.4

Research Article

Long-Term Outcomes of Coronary and Carotid Artery Disease Revascularization in the FRIENDS Study

Fabrizio Tomai,[1] Anna Piccoli,[2] Fausto Castriota,[3] Luca Weltert,[1] Bernhard Reimers,[4] Gabriele Pesarini,[2] Raoul Borioni,[1] Giovanni De Persio,[1] Roberto Nerla,[3] Andrea Pacchioni,[5] Alberto Cremonesi,[3] and Flavio Ribichini[2]

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5 years Follow up

Tomai et al. J Interv Cardiol 2019

The FRIENDS study

TABLE 3: Unadjusted comparison of primary and secondary endpoints for the 3 groups.

	Surgical	Endovascular	Hybrid	Surgical vs. Endovascular	Surgical vs. Hybrid	Endovascular vs. Hybrid	P value
	Event rates, n (%)			HR (95% CI)			
Any death	43 (11.3%)	72 (14.5%)	21 (16.9%)	0.8 (0.6-1.2)	0.6 (0.3-1.1)	0.7 (0.4-1.3)	.173
Non CV death	17 (4.5%)	34 (6.9%)	11 (8.9%)	0.7 (0.4-1.2)	0.4 (0.2-1.1)	0.6 (0.3-1.4)	.102
CV death	26 (6.8%)	38 (7.7%)	10 (8.2%)	0.9 (0.6-1.5)	0.8 (0.4-1.7)	0.9 (0.4-1.8)	.829
MI	12 (3.3%)	23 (4.7%)	11 (9.1%)	0.7 (0.4-1.4)	0.3 (0.1-0.9)	0.5 (0.2-1.2)	.019*
Stroke	6 (1.6%)	13 (2.6%)	3 (2.5%)	0.7 (0.3-1.7)	0.6 (0.1-2.5)	0.8 (0.3-3.4)	.669
CKD/haemodialysis	19 (5.2%)	35 (7.1%)	15 (12.5%)	0.7 (0.4-1.7)	0.7 (0.4-1.7)	0.6 (0.3-1.2)	.020*
MACCE	37 (10.1%)	64 (13.0%)	16 (13.2%)	0.9 (0.6-1.4)	0.6 (0.3-1.2)	0.7 (0.4-1.3)	.257
All events	58 (15.9%)	117 (23.8%)	32 (26.5%)	0.8 (0.6-1.1)	0.5 (0.3-0.8)	0.7 (0.4-1.1)	.006*

Variable Name	Cox Univariate HR	Univariate Significance	Cox Multivariate HR	Multivariate Significance
Gender	1.017 (0.568-1.821)	0.954		
Age	1.034 (1.009-1.060)	0.007	1.028 (1.001-1.055)	0.041
Hypertension	0.644 (0.404-1.025)	0.064		
Diabetes Mellitus	1.274 (0.885-1.834)	0.193		
Chronic Kidney Disease	1.353 (0.869-2.106)	0.181		
Left Ventricular Ejection Fraction	0.963 (0.945-0.982)	0.000	0.963 (0.945-0.982)	0.000
Bilateral Carotid Obstructive Disease	1.714 (1.126-2.611)	0.012		
Multivessel Coronary Artery Disease	1.459 (1.003 -2.123)	0.048		
Kind of Treatment (Surgery, Endovascual, Hybrid)	1-206 (0.901-1621)	0.206		

The FRIENDS study

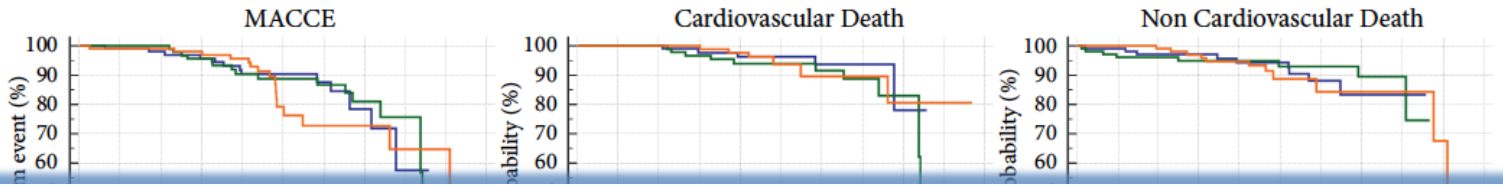
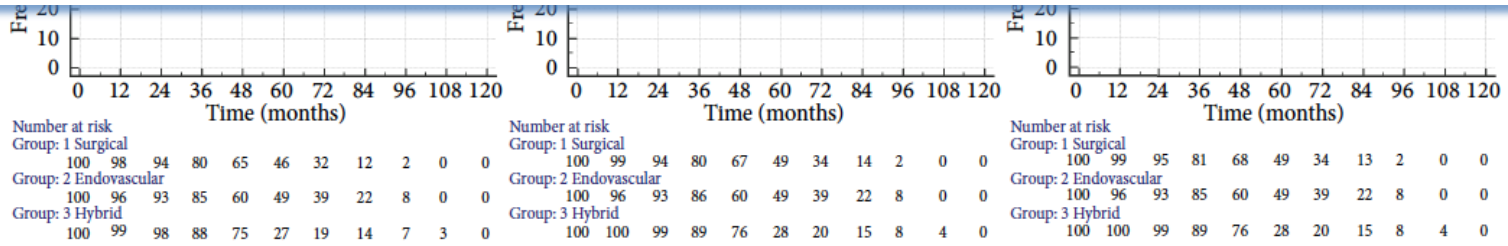


TABLE 6: Propensity-adjusted three-group comparison for the primary and secondary endpoints.

	Surgical	Endovascular	Hybrid	Surgical vs. Endovascular	Surgical vs. Hybrid	Endovascular vs. Hybrid	P value
	Event rates, n (%)			HR (95% CI)			
Any death	14 (14%)	18 (18%)	17 (17%)	0.9 (0.4-1.8)	0.9 (0.5-1.8)	1.1 (0.6-2.2)	.920
Non CV death	9 (9%)	8 (8%)	11 (11%)	1.2 (0.5-3.1)	0.9 (0.4-2.4)	0.8 (0.3-2.0)	.872
CV death	5 (5%)	10 (10%)	6 (6%)	0.6 (0.2-1.7)	0.9 (0.3-2.8)	1.6 (0.6-4.5)	.499
MI	7 (7%)	4 (4%)	11 (11%)	1.9 (0.7-5.3)	0.7 (0.2-2.0)	0.4 (0.1-1.1)	.193
Stroke	2 (2%)	3 (3%)	3 (3%)	0.8 (0.1-4.1)	0.6 (0.1-3.7)	0.8 (0.2-4.4)	.885
CKD/haemodialysis	6 (6%)	6 (6%)	14 (14%)	1.0 (0.4-2.7)	0.5 (0.2-1.2)	0.5 (0.2-1.2)	.093
MACCE	13 (13%)	15 (15%)	16 (16%)	1.0 (0.5-2.1)	0.9 (0.4-1.9)	0.9 (0.4-1.8)	.946
All events	24 (24%)	26 (26%)	30 (30%)	0.9 (0.5-1.6)	0.9 (0.5-1.5)	0.8 (0.5-1.4)	.690

CKD=chronic kidney disease; CV=cardiovascular; MACCE=Major Adverse Cardiac and Cerebrovascular Events; MI= myocardial infarction.



Tomai et al. J Interv Cardiol 2019

Conclusion

The correct management of patients with multi-level vascular disease is particularly challenging and should be tailored according to a comprehensive medical evaluation and LOCAL EXPERIENCE rather than focusing on a determined form of intervention

Thank You for your attention

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