

Après FUTURE et FARGO faut-il poursuivre la
FFR ?

Non

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DÉCLARATION DE LIENS D'INTÉRÊT AVEC LA PRÉSENTATION

Intervenant : Pierre BARNAY, Marseille

- Je n'ai pas de lien d'intérêt à déclarer
- Je suis un utilisateur régulier de la FFR....

Positionnement de la FFR

Recommendations	Class ^a	Level ^b
When evidence of ischaemia is not available, FFR or iwFR are recommended to assess the haemodynamic relevance of intermediate-grade stenosis. ^{15,17,18,39}	I	A
FFR-guided PCI should be considered in patients with multivessel disease undergoing PCI. ^{29,31}	IIa	B

FAME
DEFER
FAME 2
IFR-SWEDEHEART
R3F...

La FFR permet-elle d'apporter en toutes circonstances, de façon indiscutable et définitive, une réponse binaire sur la nécessité de revascularisation?

La FFR permet-elle de décider d'une stratégie de traitement, entre OMT, CABG ou PCI ?

Future

Study design



All-comer Patient with stable or stabilized angina
Multivx-disease (>50% stenosis) including LAD
at the time of angiography

exclusion criteria
STEMI<12h
no LAD disease
CI to FFR

Randomisation 1:1

FFR-guided

Angio-guided

FFR on all target lesions

FFR>0.80 lesions
disregarded for TT

*non-invasive tests
allowed*

Only lesions with FFR≤0.80
included in stratification

All lesions with %S>50
included in stratification

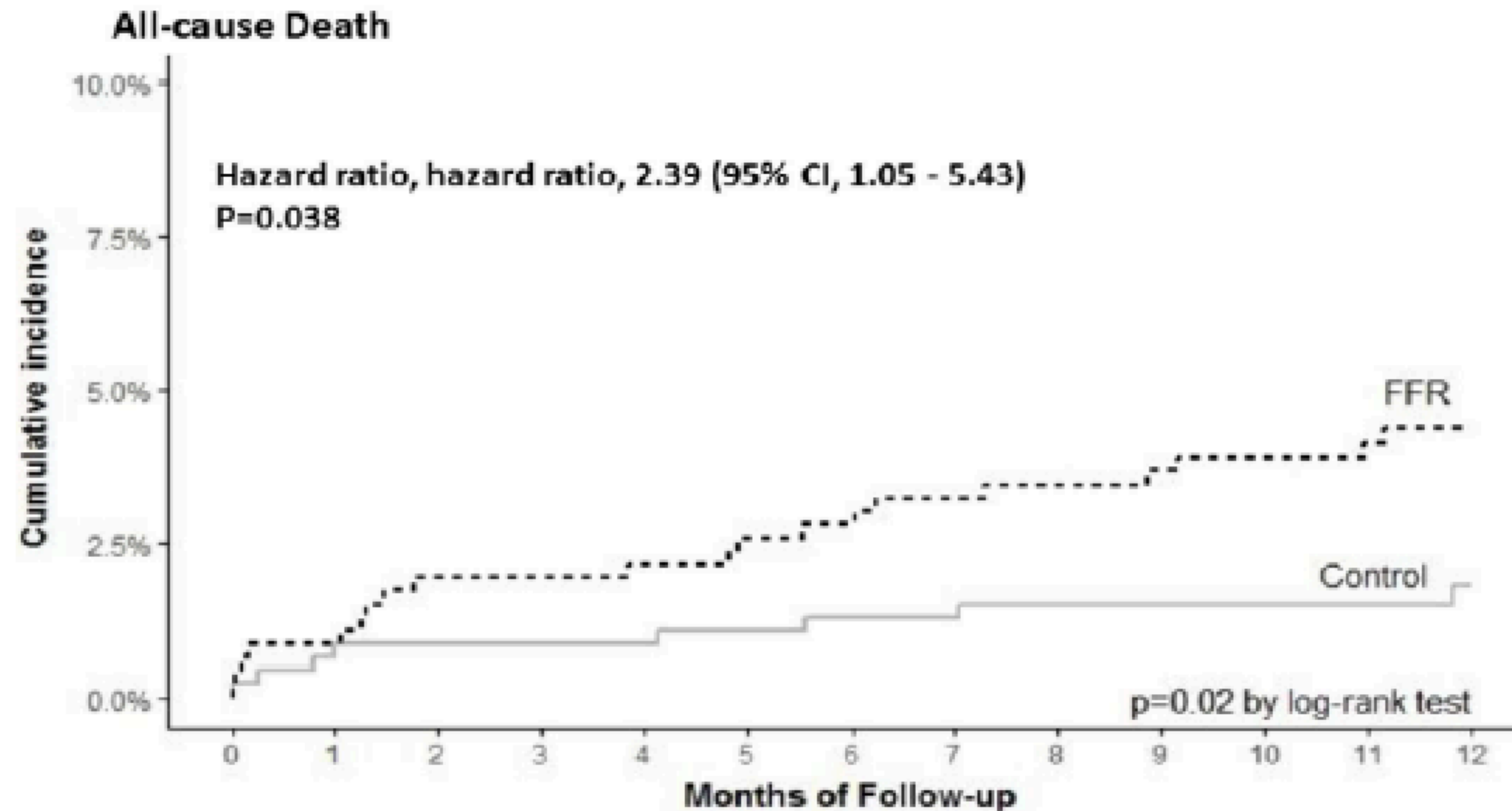
PCI + OMT CABG + OMT OMT only

PCI + OMT CABG + OMT OMT only

Primary endpoint

All cause mortality + Myocardial Infarction
+ Repeat revascularization + Stroke

Future



No. at Risk

Control	470	465	464	464	463	462	461	461	458	455	441	414	267
FFR	468	463	455	454	453	449	448	445	442	435	423	404	255

Over n = 836 first patients

All-cause deaths at 12 months(n=24):

- control : 7 (2%)

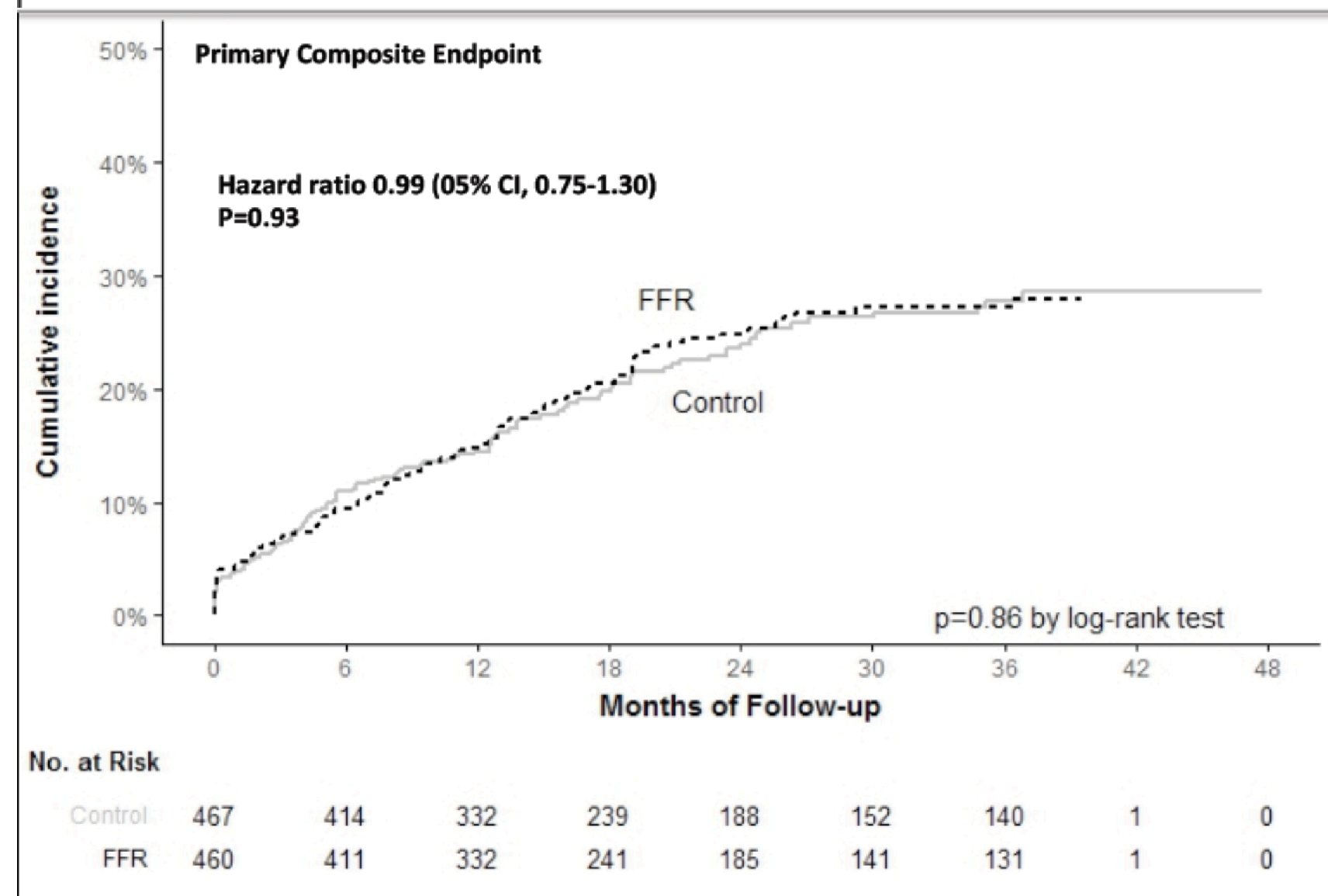
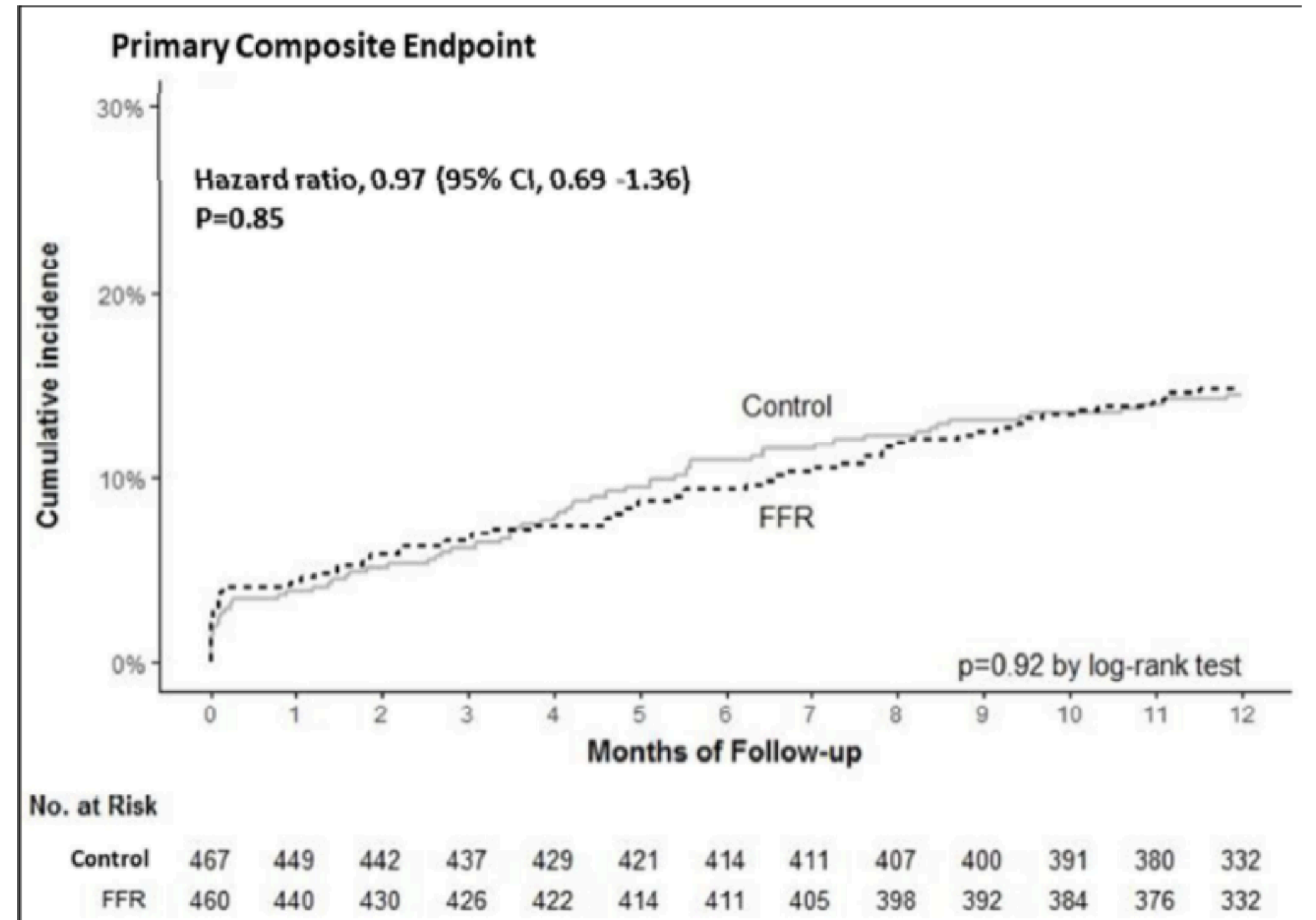
- FFR : 17 (4%)

HR 2.39, P=0.0193

Cardiovascular death: 72% of all deaths

Recrutement interrompu à n=936 pts

Future



Events	Control group (n=467)	FFR group (n=460)	Hazard Ratio (95%CI)	P value
Composite endpoint (no.) (%)	67 (14.4)	67 (14.6)	0.97 (0.69-1.36)	0.85
Death from any cause (no.) (%)	7 (1.5)	17 (3.7)	2.34 (0.97-5.68)	0.036
				(by logrank test)
Cardiovascular death (no.) (%)	5 (1.1)	12 (2.6)	2.37 (0.83-6.76)	0.11
Myocardial infarction (no.) (%)	28 (6)	28 (6.1)	1.03 (0.61-1.74)	0.90
Stroke (no.) (%)	7 (1.5)	1 (0.2)	0.13 (0.02-1.07)	0.06
Unplanned revascularization (no.) (%)	46 (9.9)	37 (8)	0.79 (0.51-1.22)	0.28

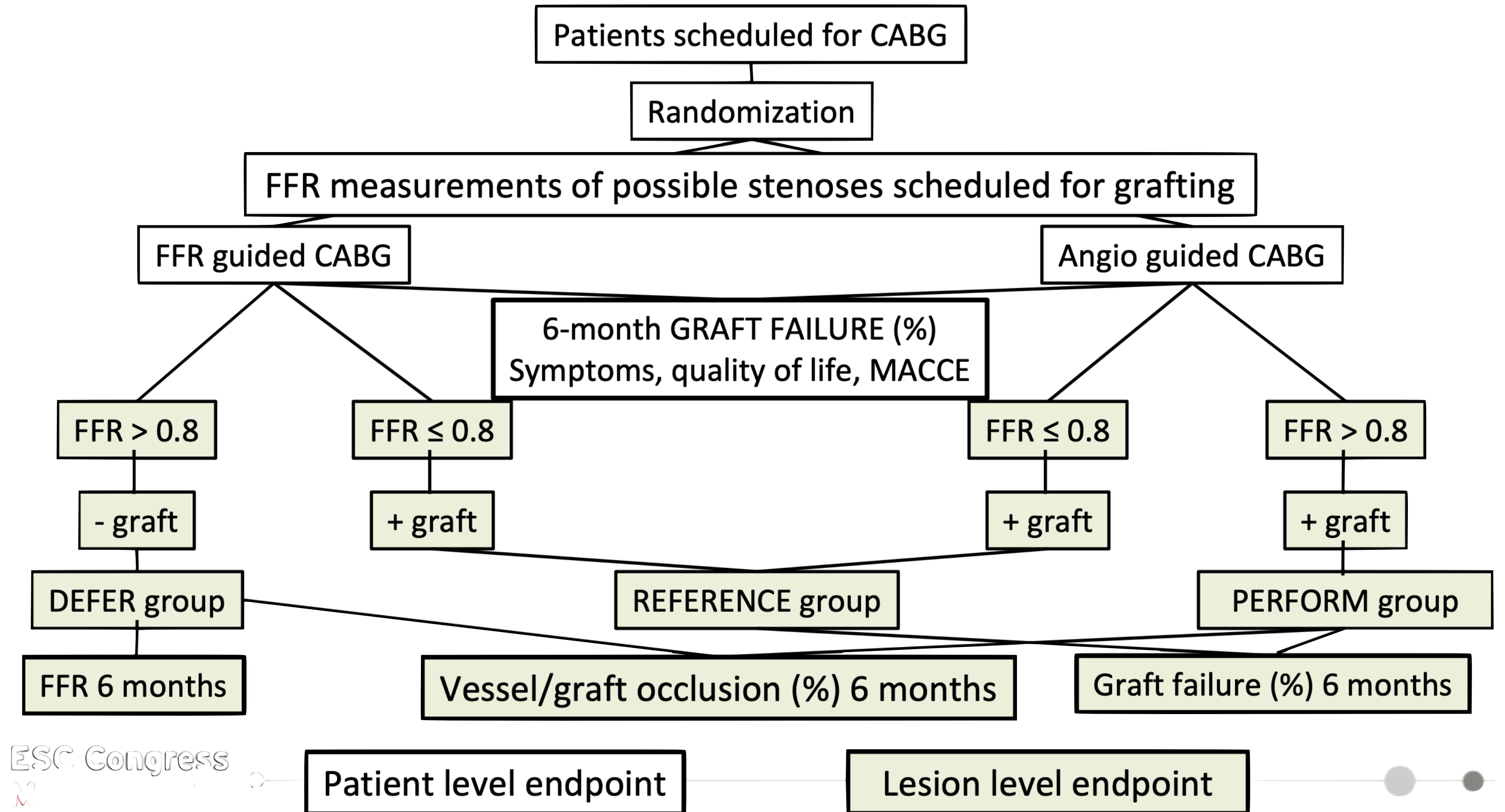
FARGO

Critère primaire :

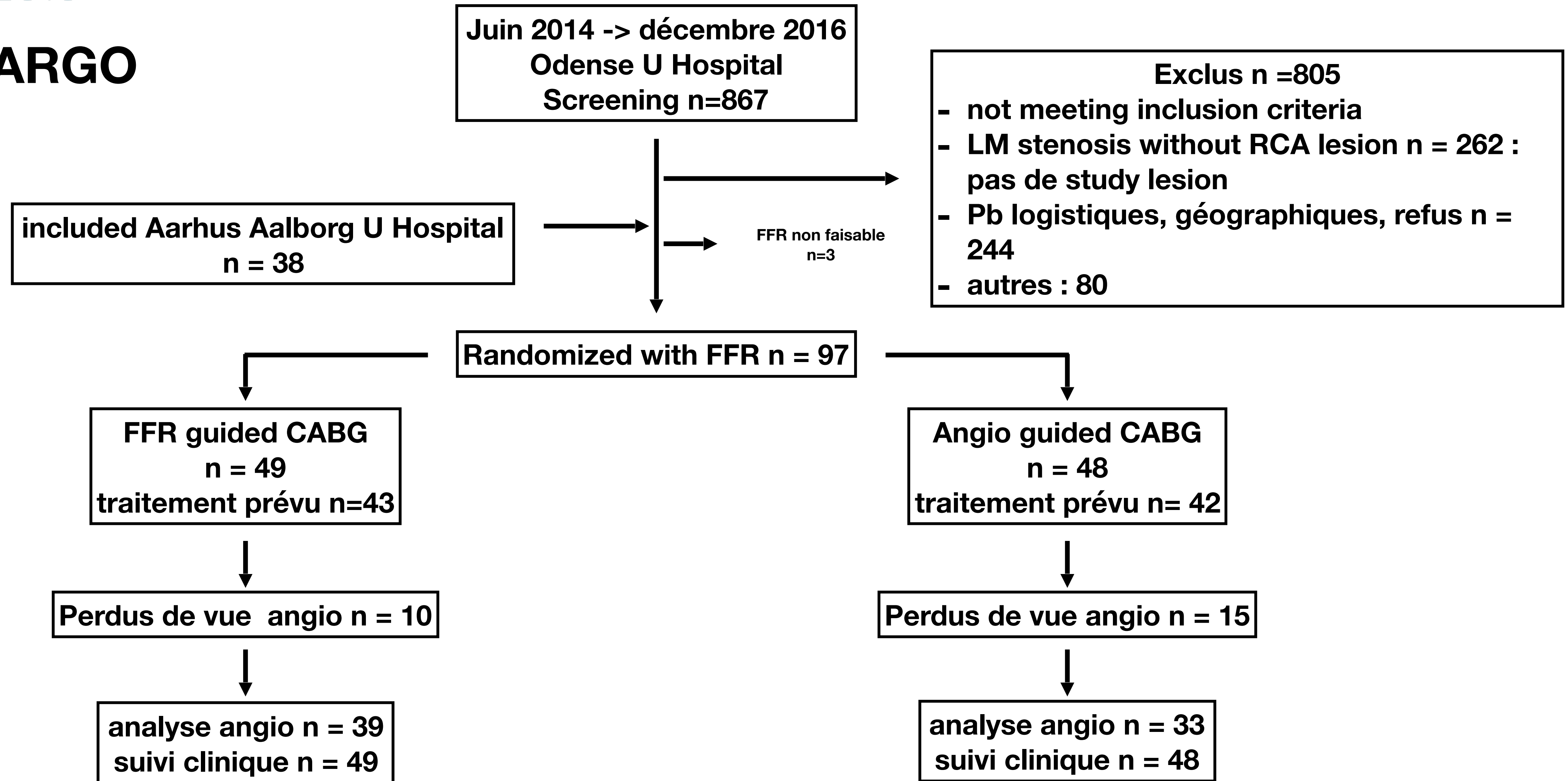
- pourcentage de dysfonction de pontage par rapport au nombre total de ponts

Critères secondaires :

- sténose pontage
- MACCEs : all cause death, MI, revasc, stroke
- composants du MACCE
- statut CCSC
- temps chirurgicaux
- CPK MB post op

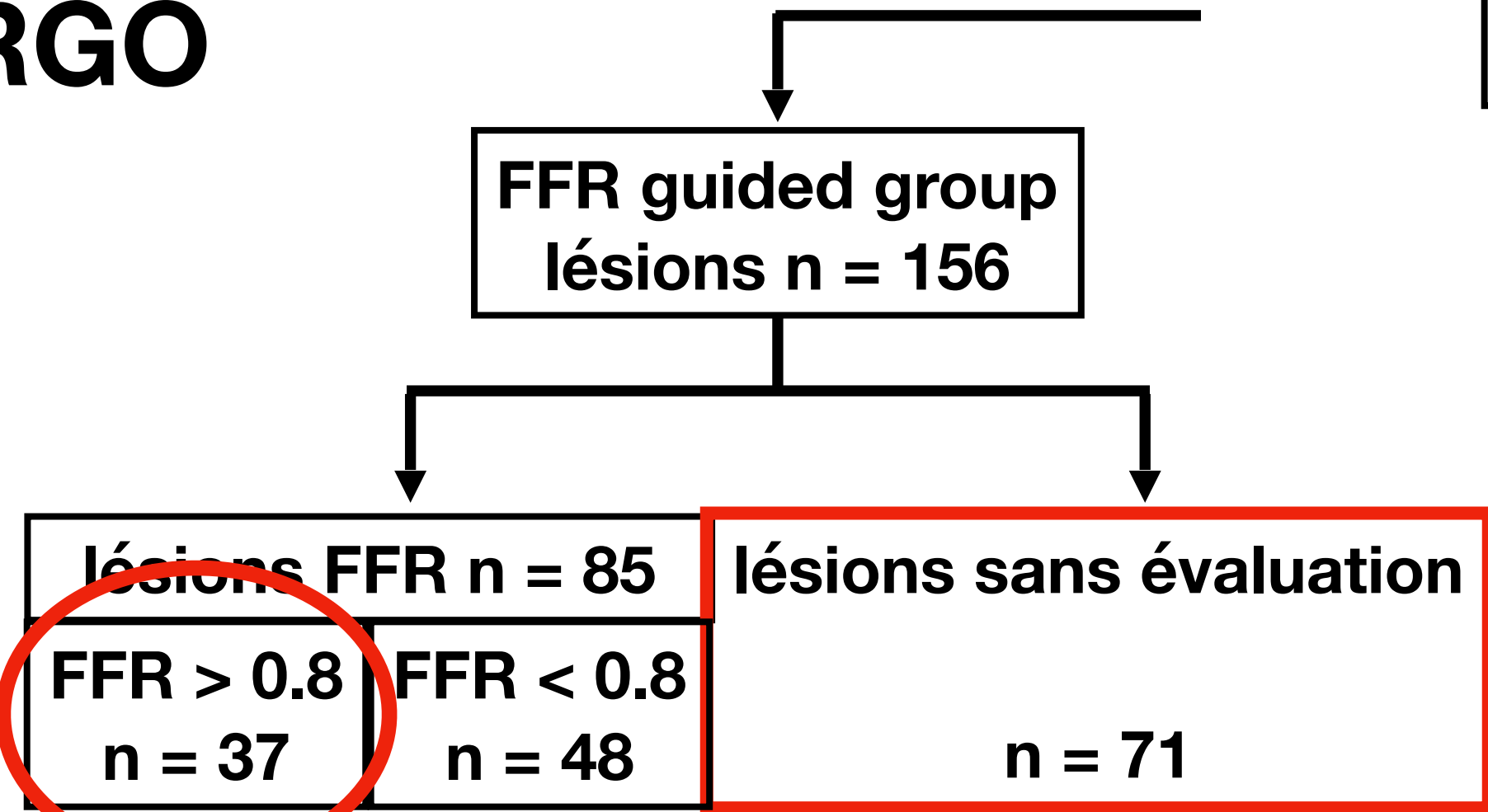


FARGO

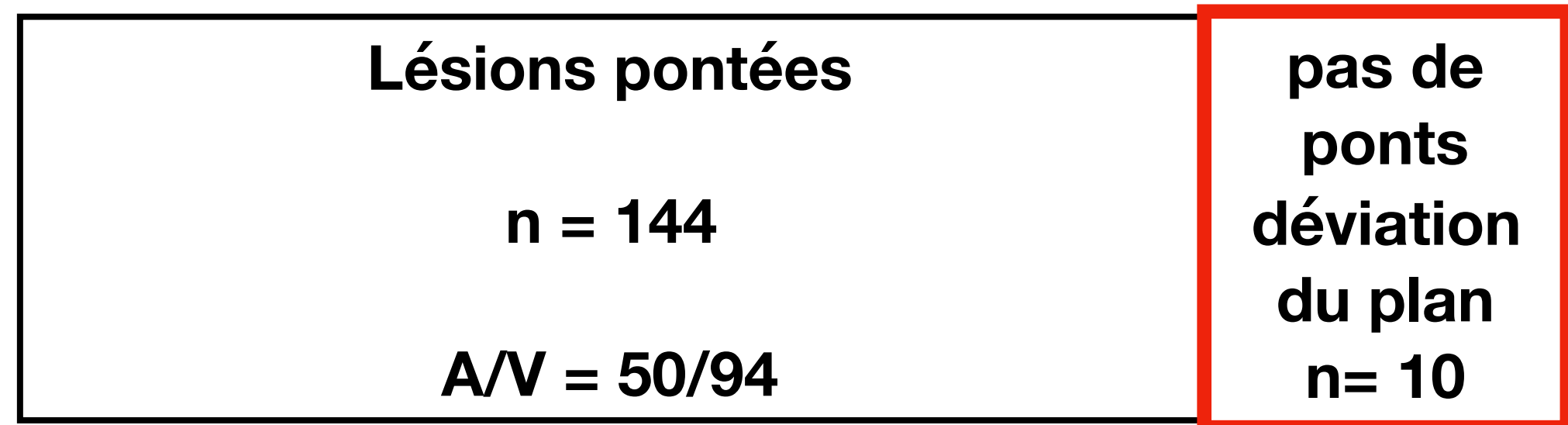
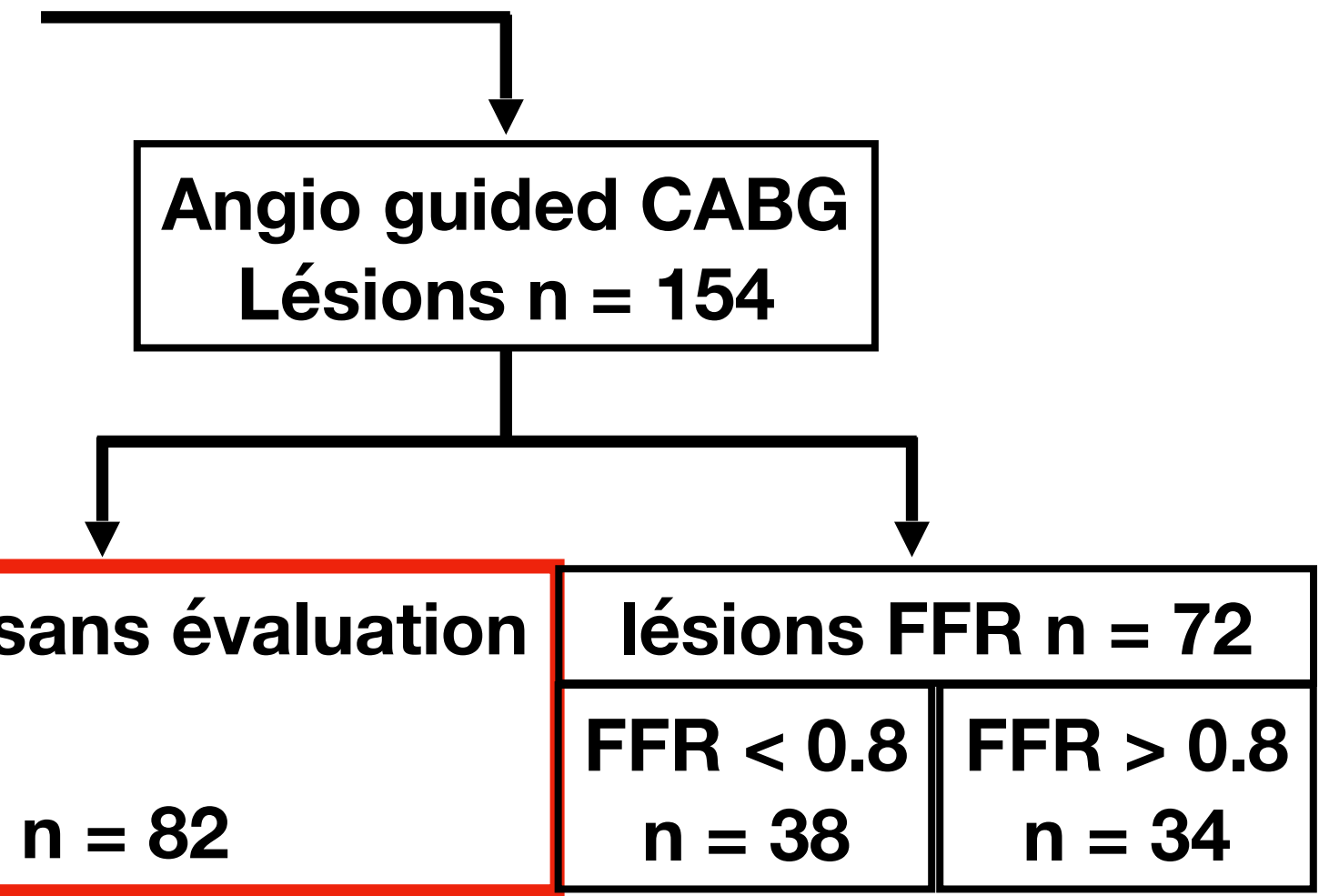


FARGO

HEART TEAM
 lésions n = 310



FFR



FARGO

Grafts Failure

	FFR guided CABG n=94	Angio guided CABG n=100	p Value
All graft failures at 6 months	15 (16%)	13 (13%)	0.56
	FFR ≤0.80 n=61	FFR >0.80 n=20	
Graft failures according to FFR-value at 6 months	5 (8%)	2 (10%)	0.80
	Arterial grafts n=70	Venous grafts n=124	
Graft failures according to graft type at 6 months	10 (14%)	18 (15%)	0.97

Clinical outcomes

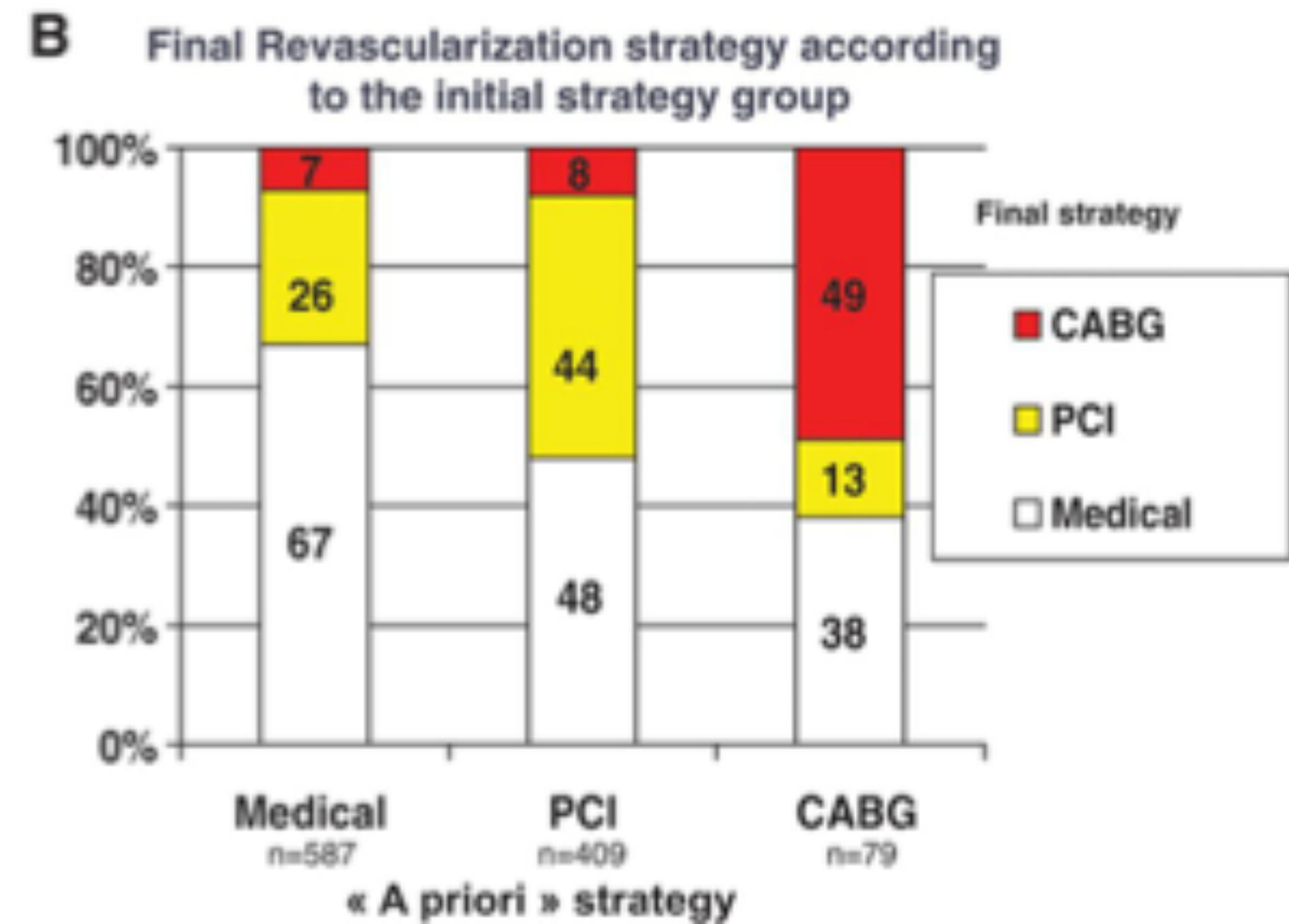
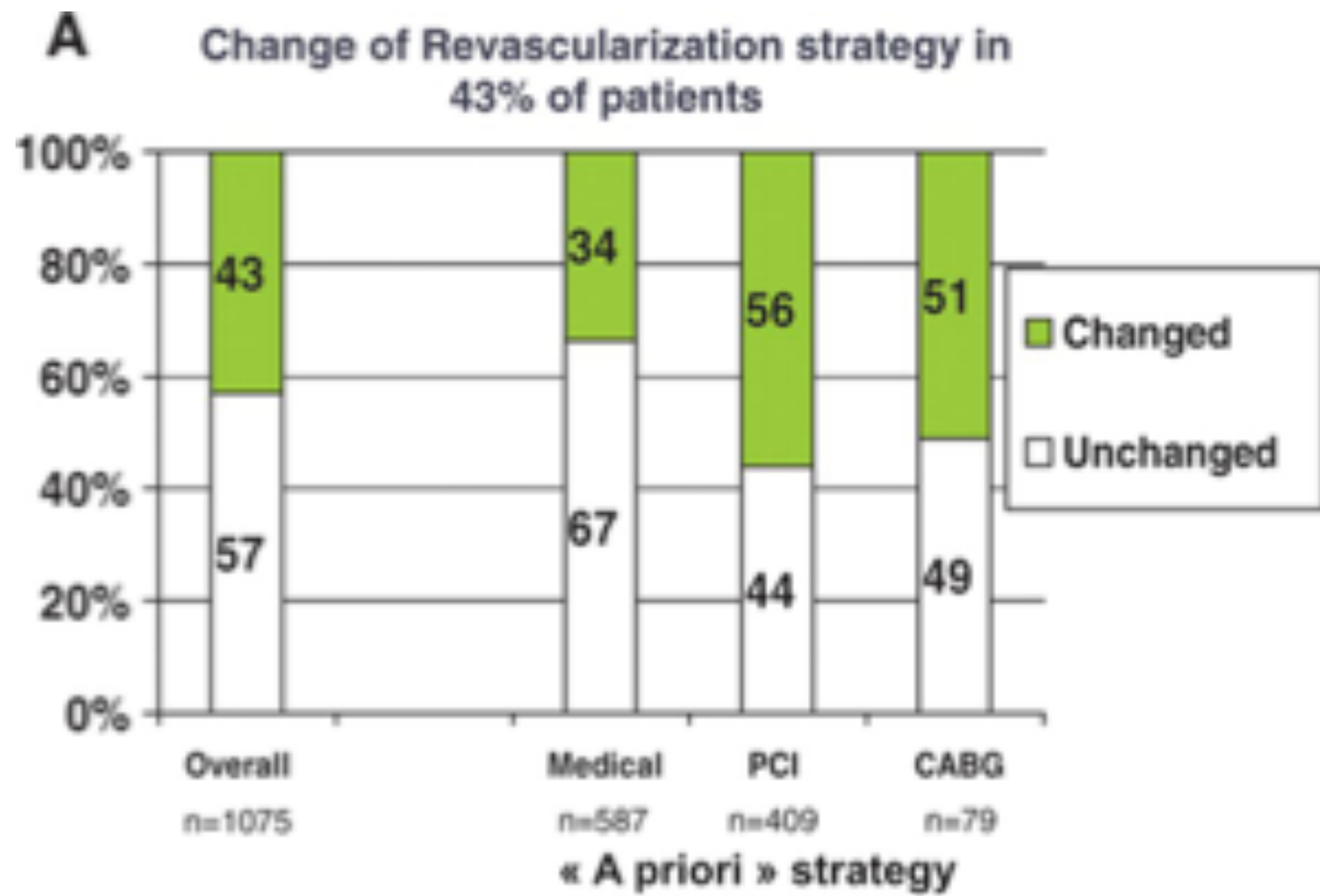
6-month clinical endpoints (all patients)			
Death	0 (0)	2 (4)	0.24
Myocardial infarction	1 (2)	0 (0)	0.50
Stroke	2 (4)	1 (2)	0.51
All revascularizations before follow-up	3 (6)	3 (6)	1.00
Hybrid revascularization decided at CABG	1 (2)	3 (6)	
Other revascularizations	2 (4)	0 (0)	
MACCE	6 (12)	6 (12)	0.97
CCS II–IV	5 (10)	2 (4)	0.29

Quelles conclusions ?

FUTURE La FFR n'est pas un outil pertinent pour décider de la stratégie de prise en charge entre OMT, PCI et CABG

FARGO La FFR n'est pas un outil supérieur à l'angio pour une stratégie de revascularisation chirurgicale

FFR et pluri tronculaire

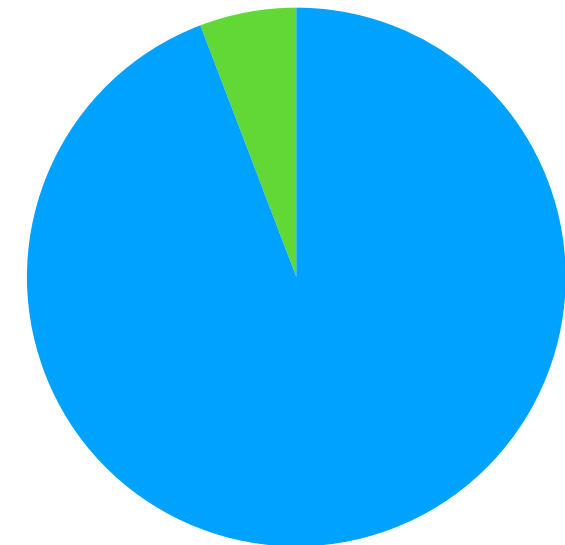


Angio guided
n=429

FFR guided
n=198

A

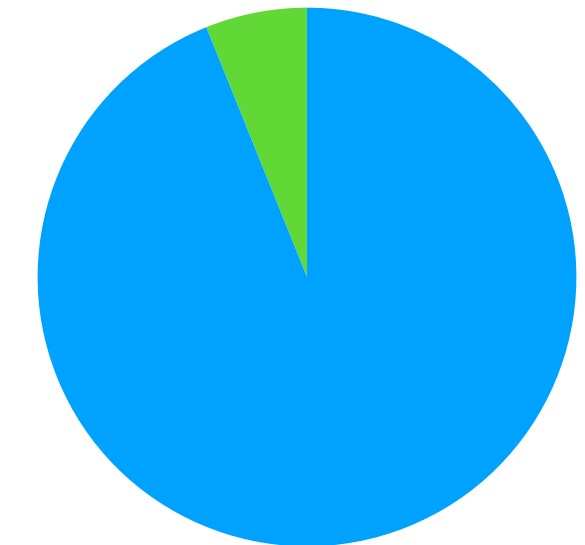
Multivessel-disease n(%)



404 (94,2)

p=0,722

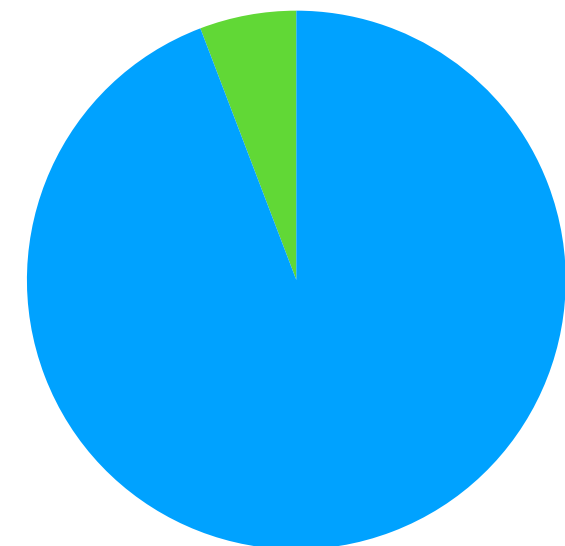
186 (93,9)



p<0,001 after FFR

B

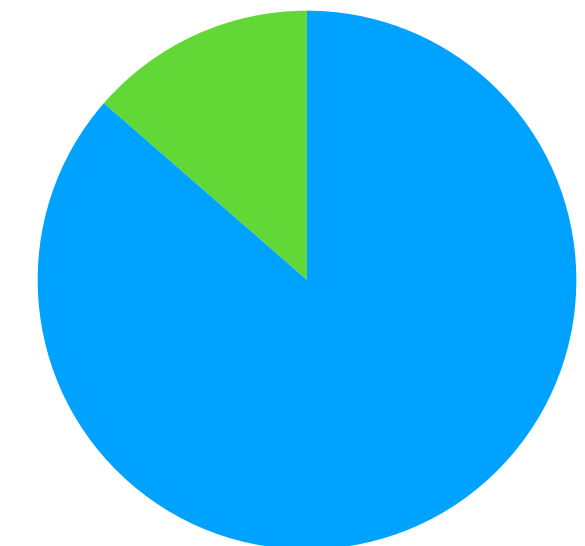
Multivessel-disease n(%)



404 (94,2)

p=0,002

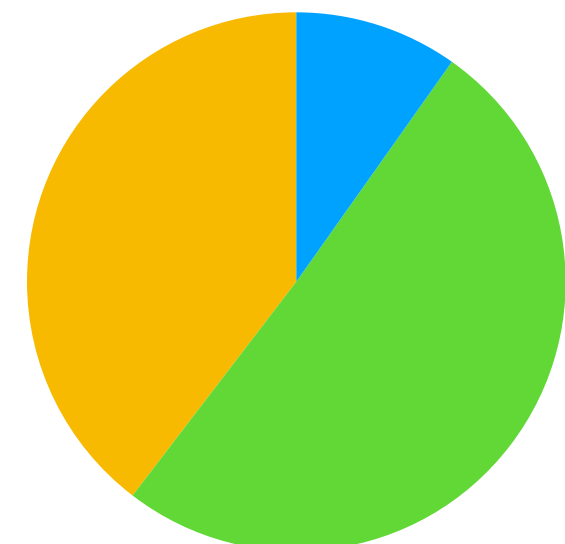
171 (86,4)



C

Anastomoses n(%)

- 1
- 2-3
- 4 et +



42 (9,8)

217 (50,6)

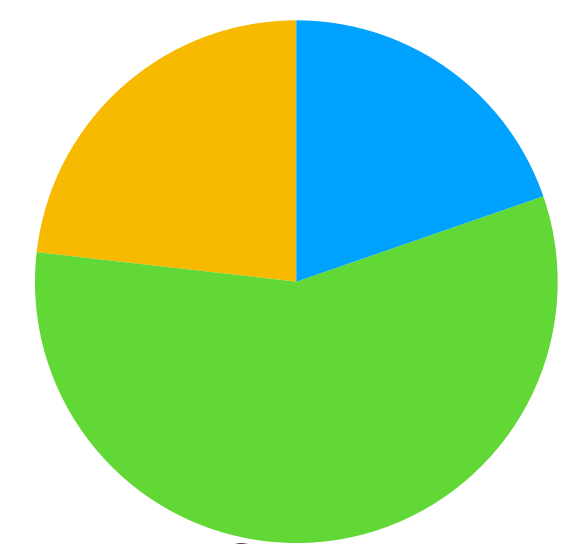
170 (39,6)

p<0,001

29 (19,7)

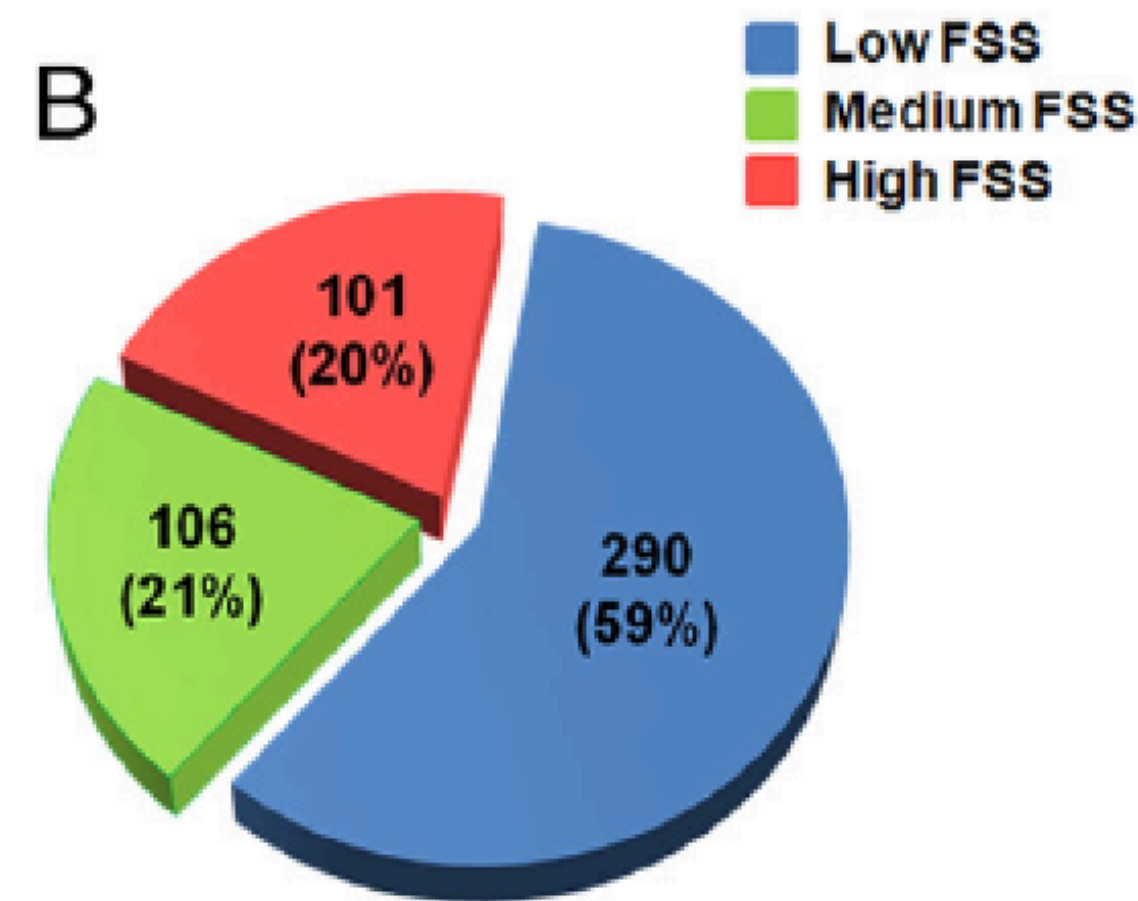
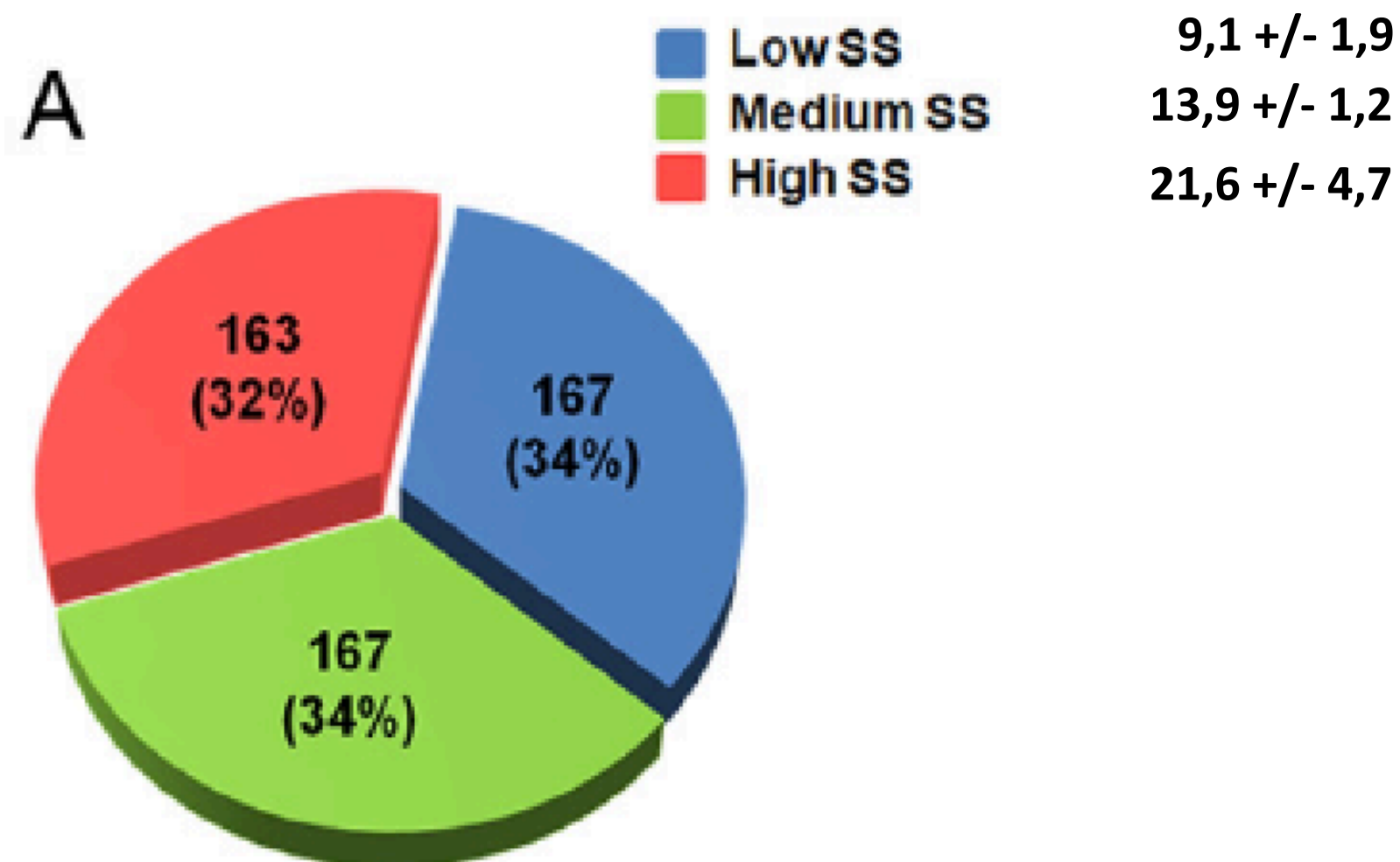
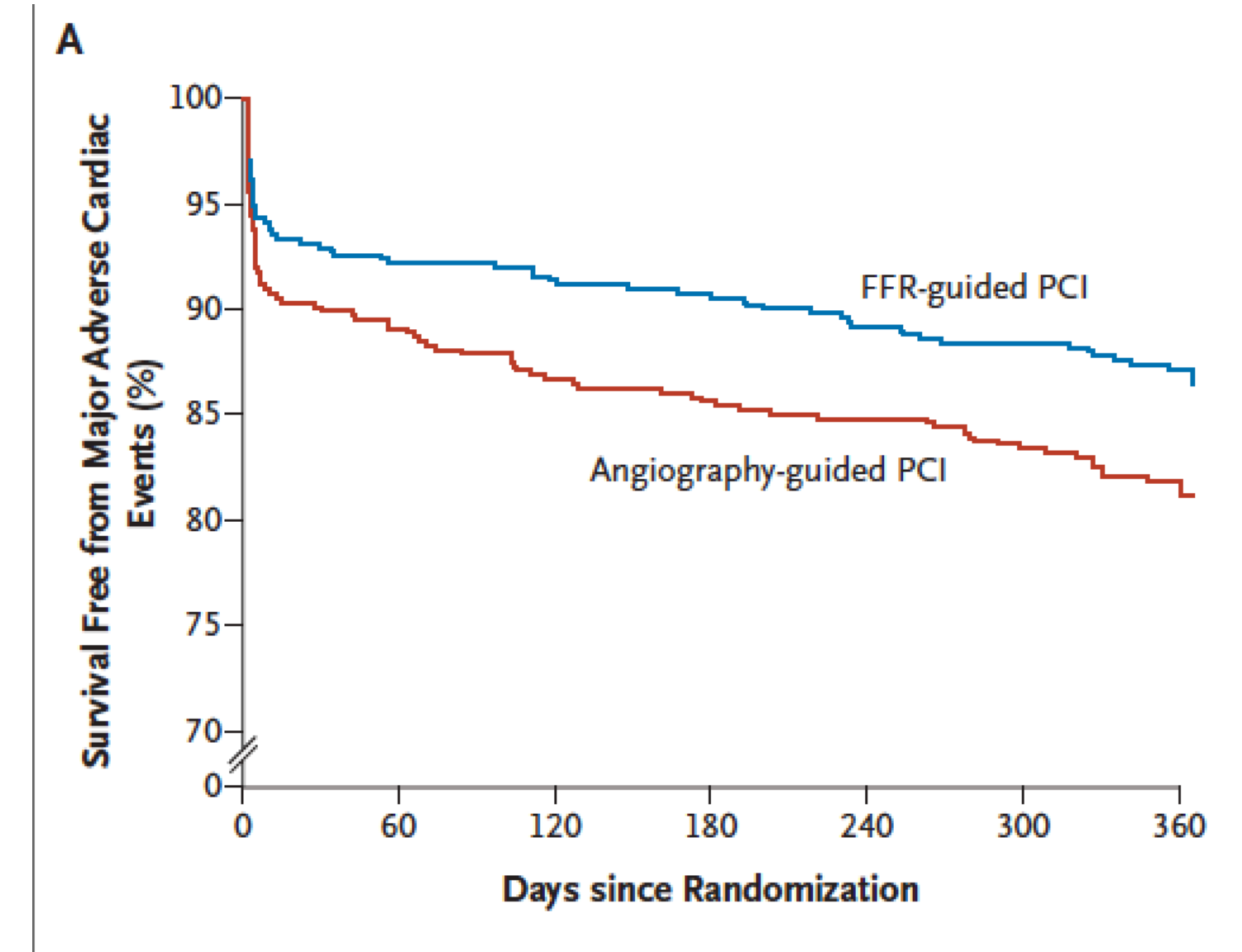
113 (57,1)

46 (23,2)



FFR et pluri tronculaire

Characteristic	Angiography Group (N= 496)	FFR Group (N= 509)
Angiographic Findings		
Indicated lesions per patient — no.¶	2.7±0.9	2.8±1.0
Extent of occlusion — no. of lesions/total no. (%)		
50–70% narrowing	550/1350 (40.7)	624/1414 (44.1)
71–90% narrowing	553/1350 (41.0)	530/1414 (37.5)
91–99% narrowing	207/1350 (15.3)	202/1414 (14.3)
Total occlusion	40/1350 (3.0)	58/1414 (4.1)
Patients with total occlusion — no. (%)	37 (7.5)	54 (10.6)
SYNTAX score¶	14.5±8.8	14.5±8.6

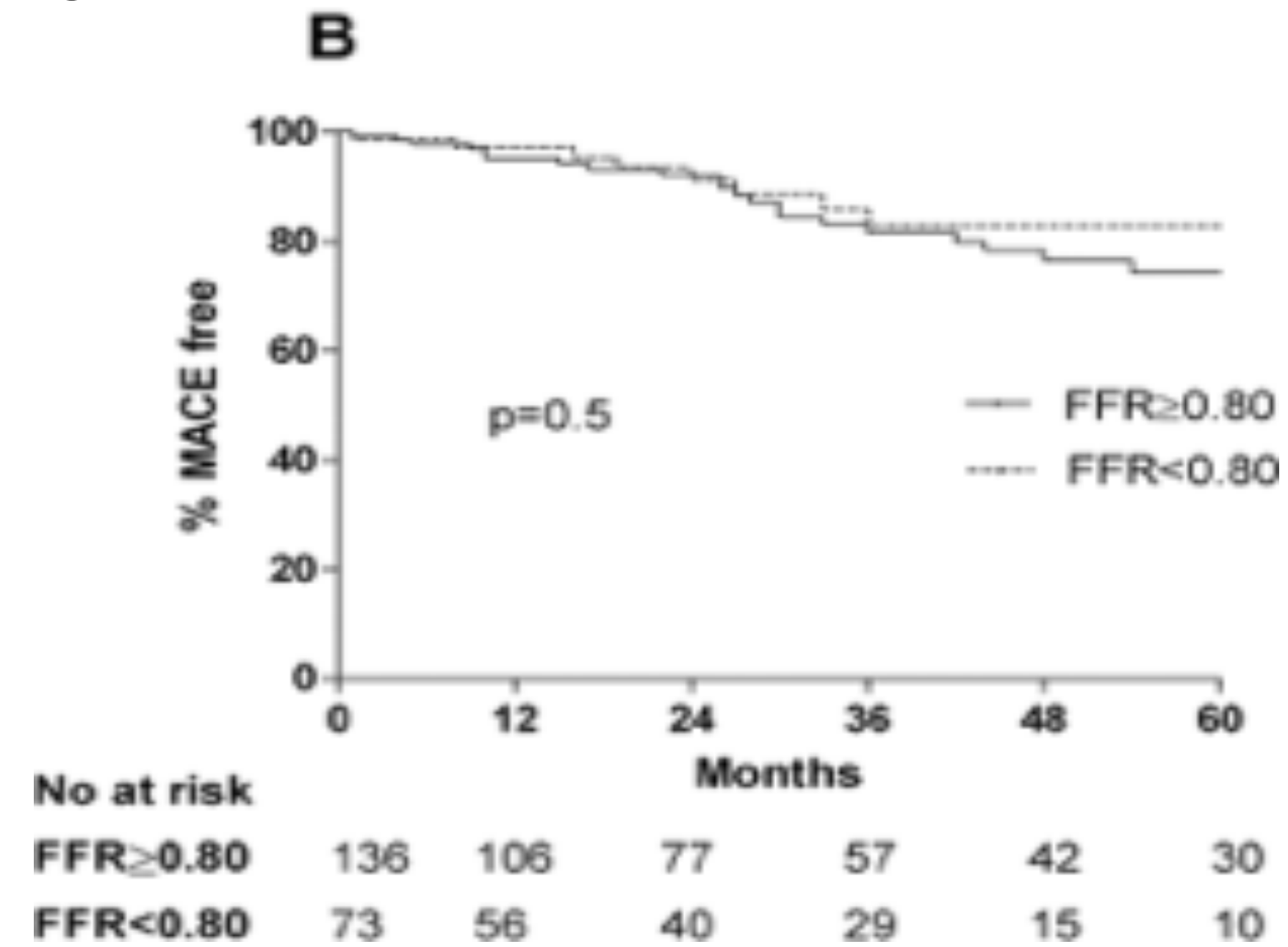
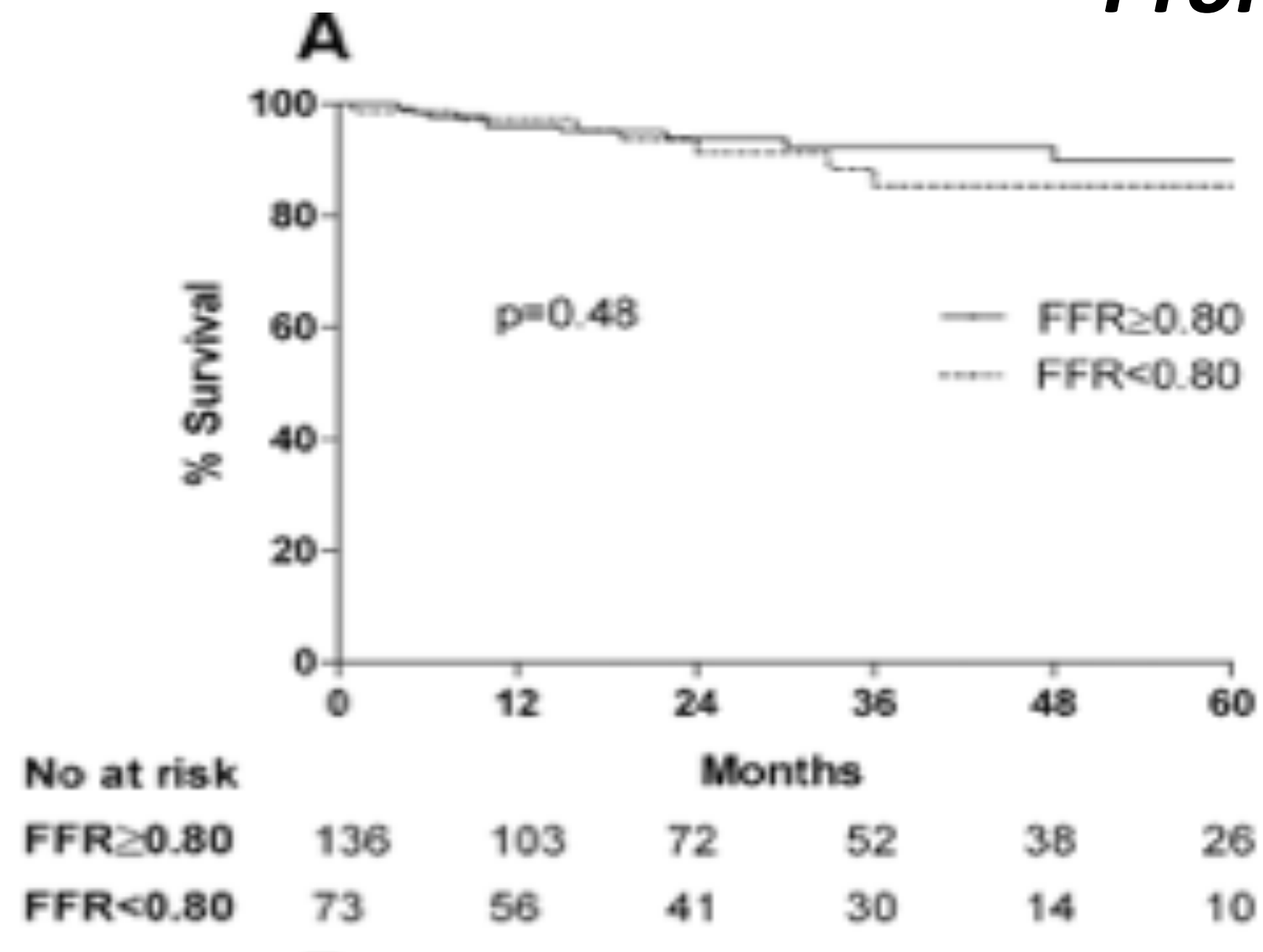


Nam et al. JACC 2011

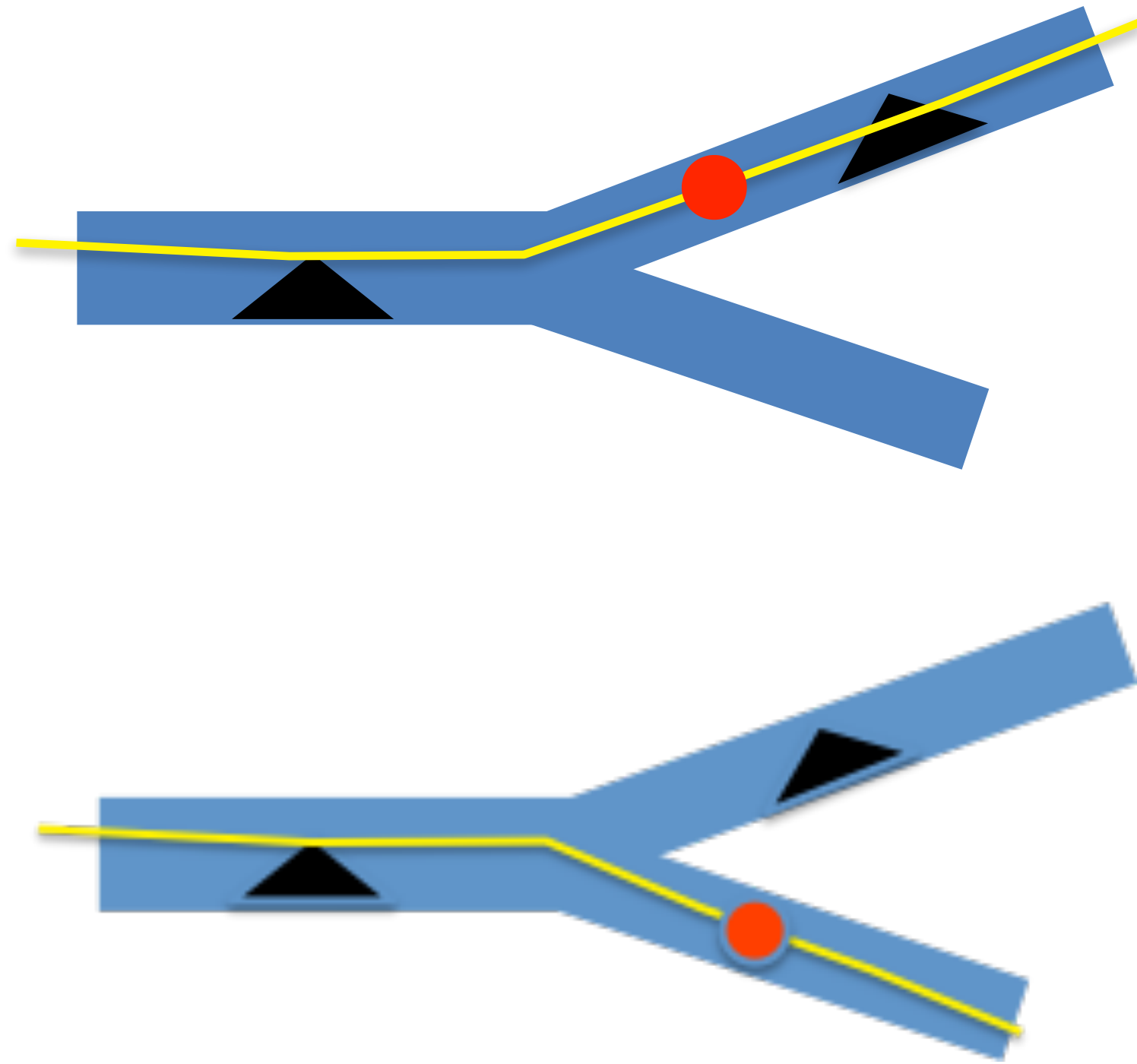
Tonino et al. N Engl J Med 2009

FFR et tronc commun

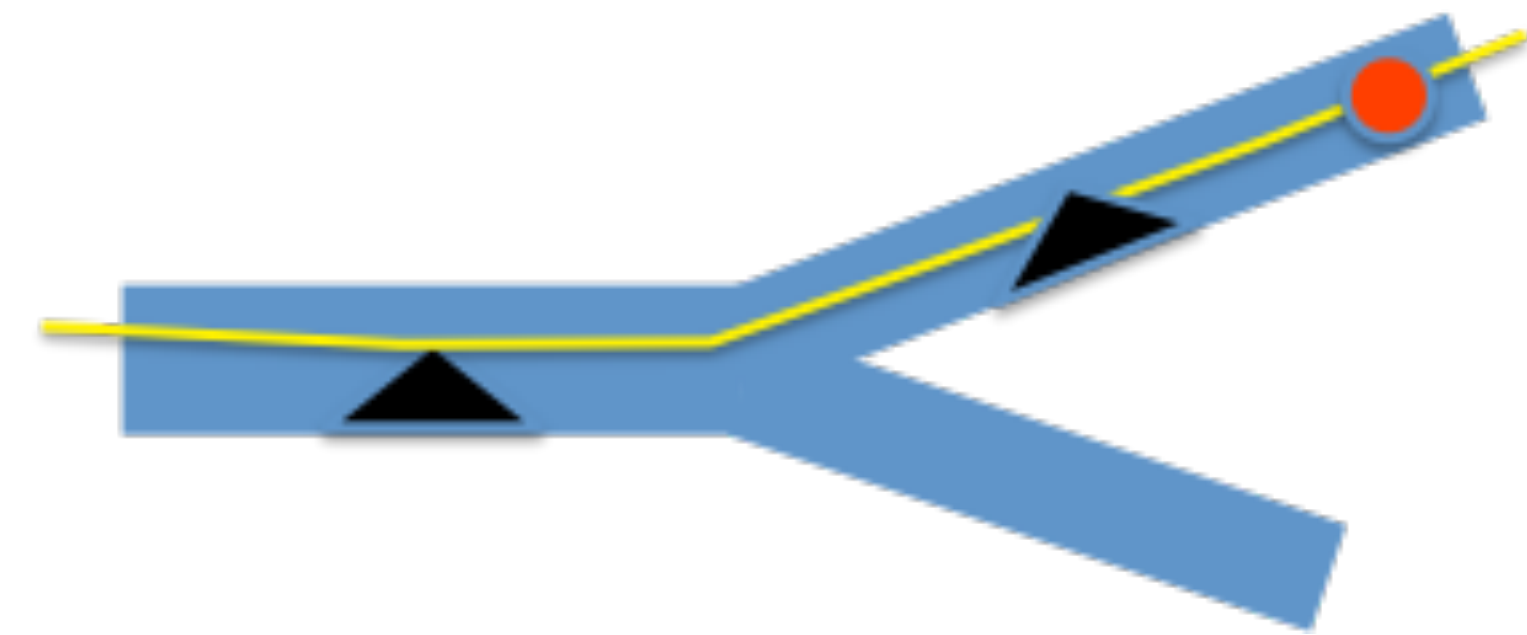
Pronostic à 5 ans



FFR et tronc commun

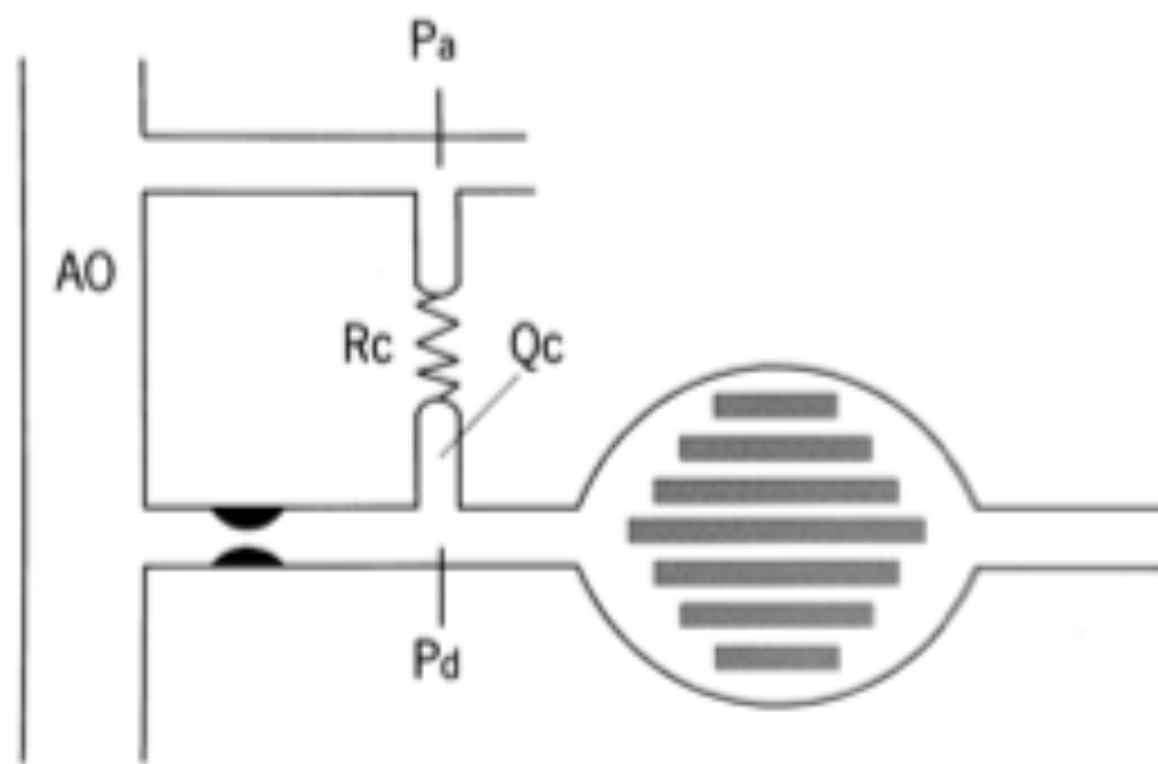
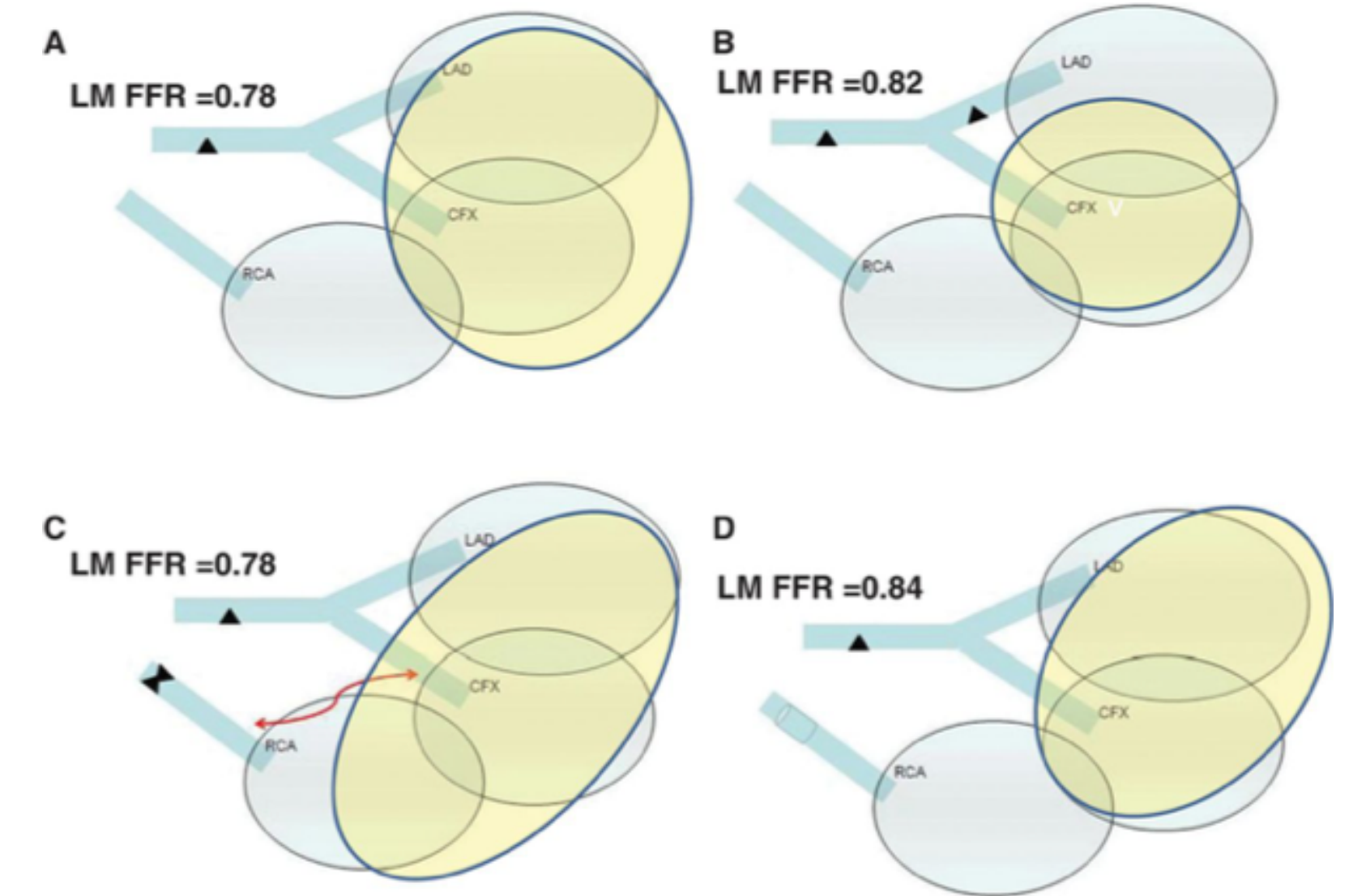
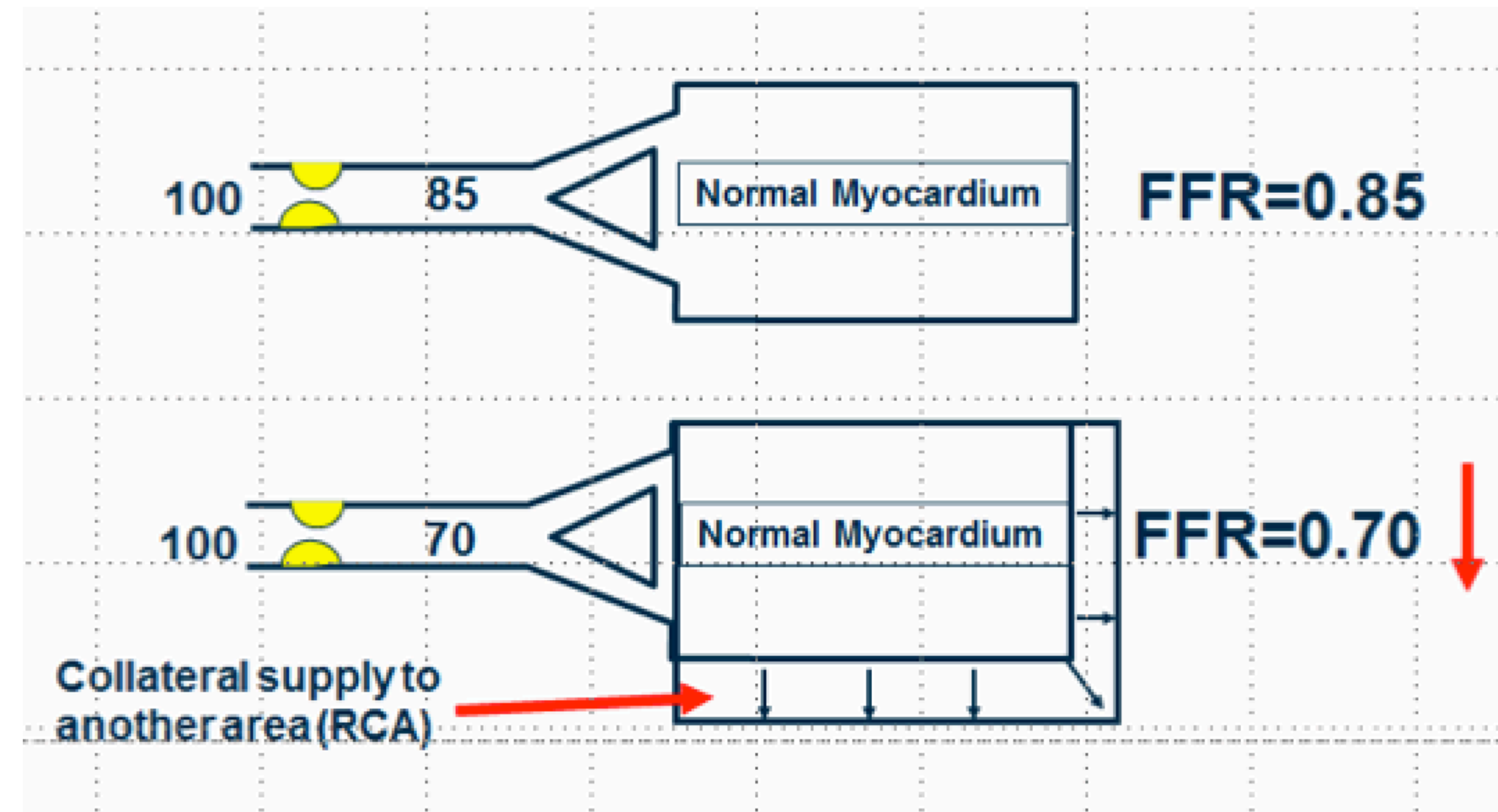


Risque de FFR faussement négative



Risque de FFR faussement positive

FFR et collatéralités



Tonino TCT 2010

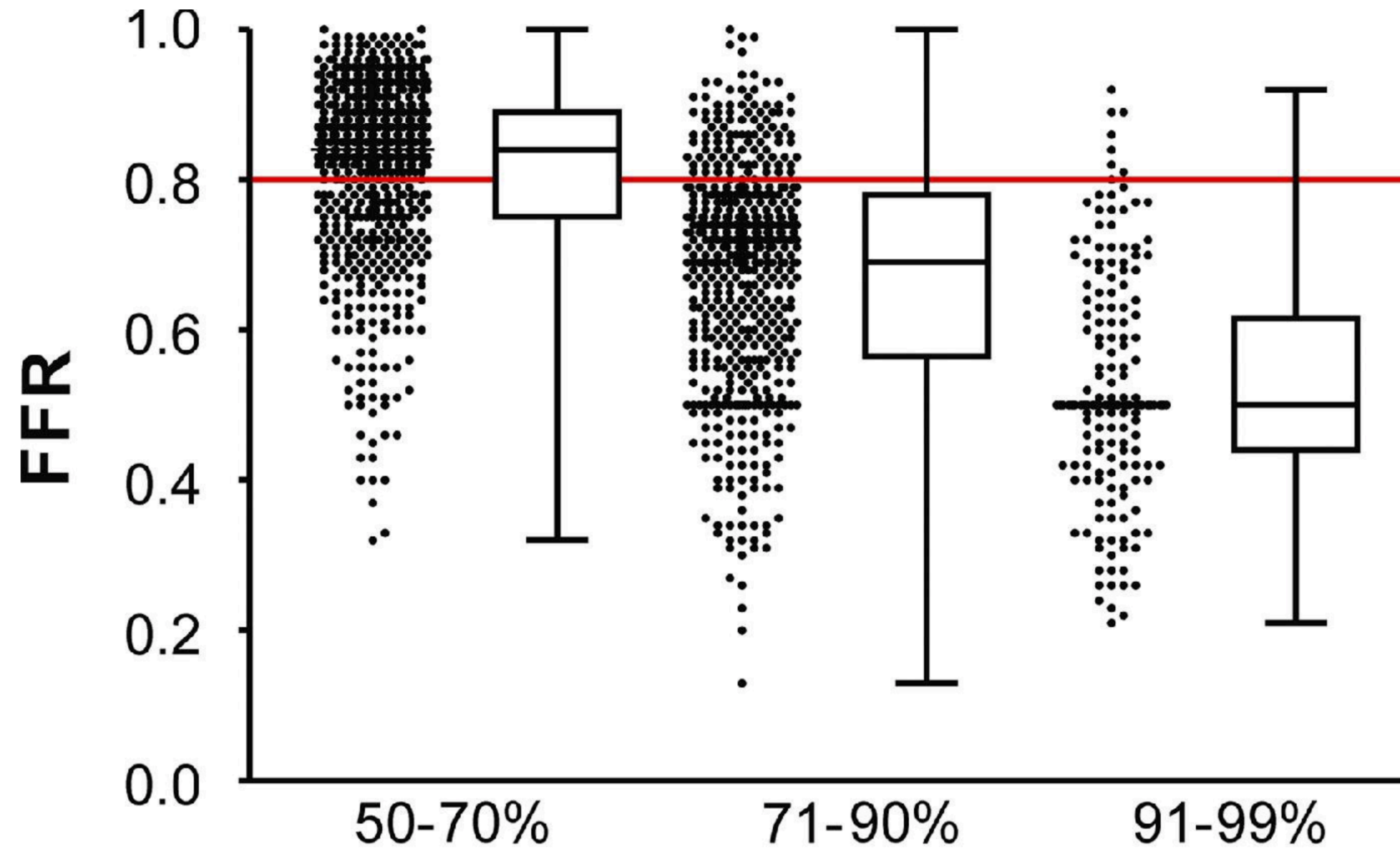
Kern MJ. Circintervention 2013

FFR et pluri tronculaire complexe

Plusieurs types de problèmes potentiellement associés

- le tronc commun non isolé
- les collatéralités
- les lésions en chapelet
- l'athérome diffus....
- Les limites techniques de mesure

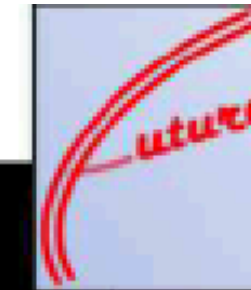
FARGO : des patients complexes ?



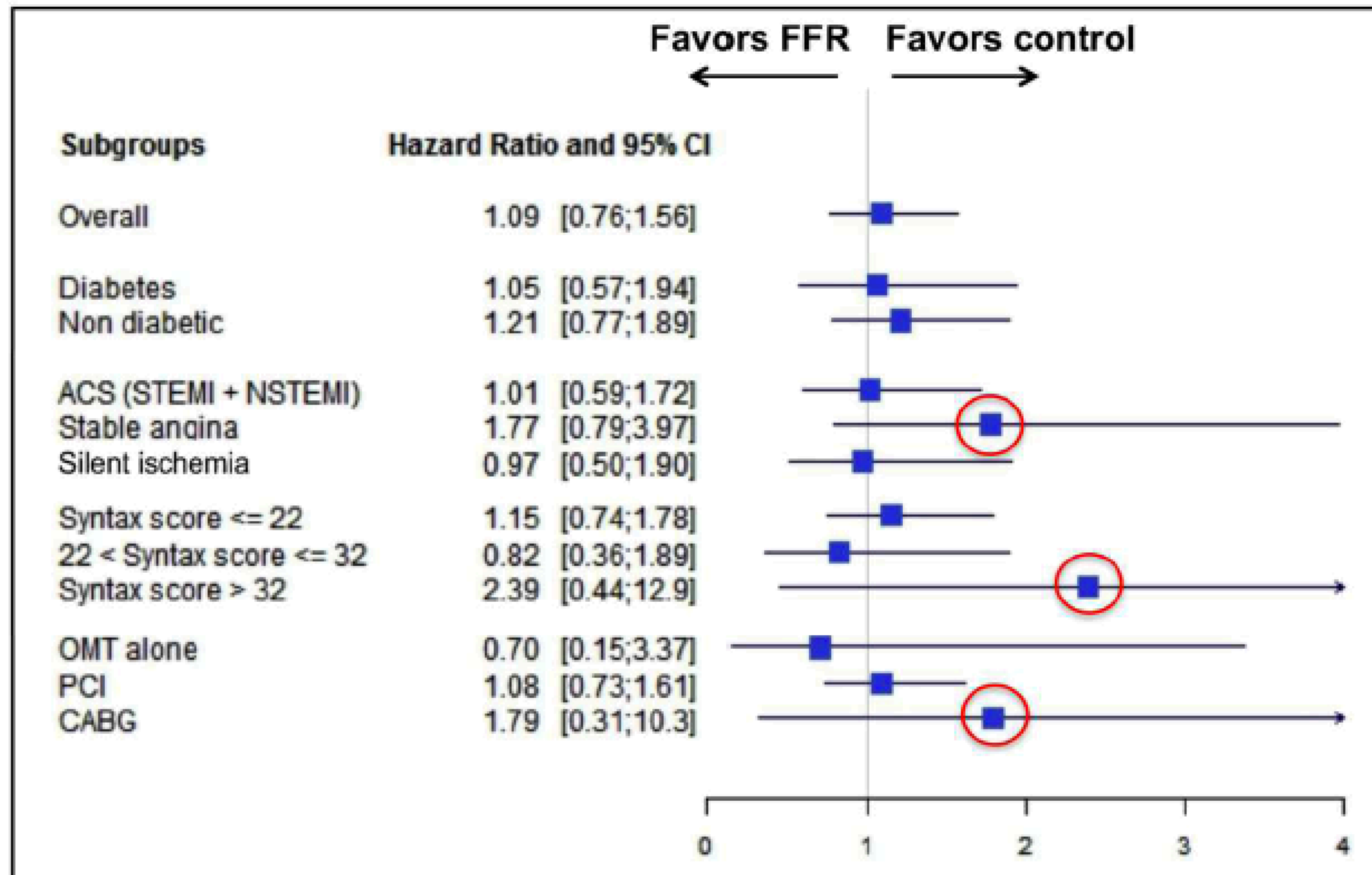
FUTURE : des patients complexes ?

Angiographic findings

Variable	Control group (n=469)	FFR group (n=465)	P-value
2-vessel disease (%)	225 (48)	201 (43)	0.34
3-vessel disease (%)	229 (49)	251 (54)	
LAD involved (%)	453 (97)	448 (96)	0.84
Left main (%)	51 (11)	59 (13)	0.39
SYNTAX score (mean±SD)	18±8 (442)	19±8 (446)	0.15
50-69% of diameter (no.) (%)	695 (45)	805 (51)	
70-90% of diameter (no.) (%)	462 (41)	560 (36)	
> 90% of diameter (no.) (%)	128 (8)	105 (7)	
Total occlusion (no.) (%)	85 (5)	100 (6)	



Pre-specified subgroups analysis

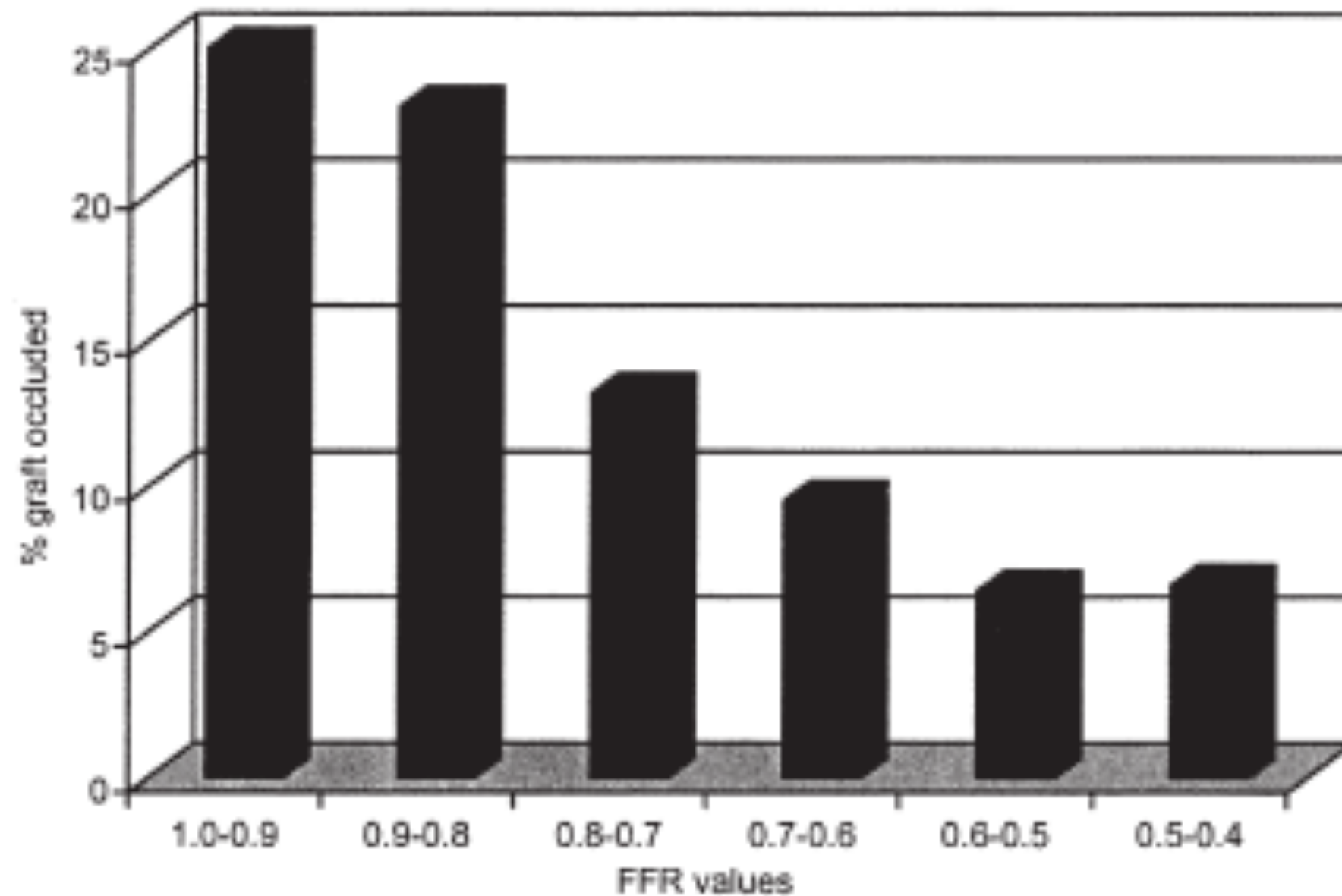
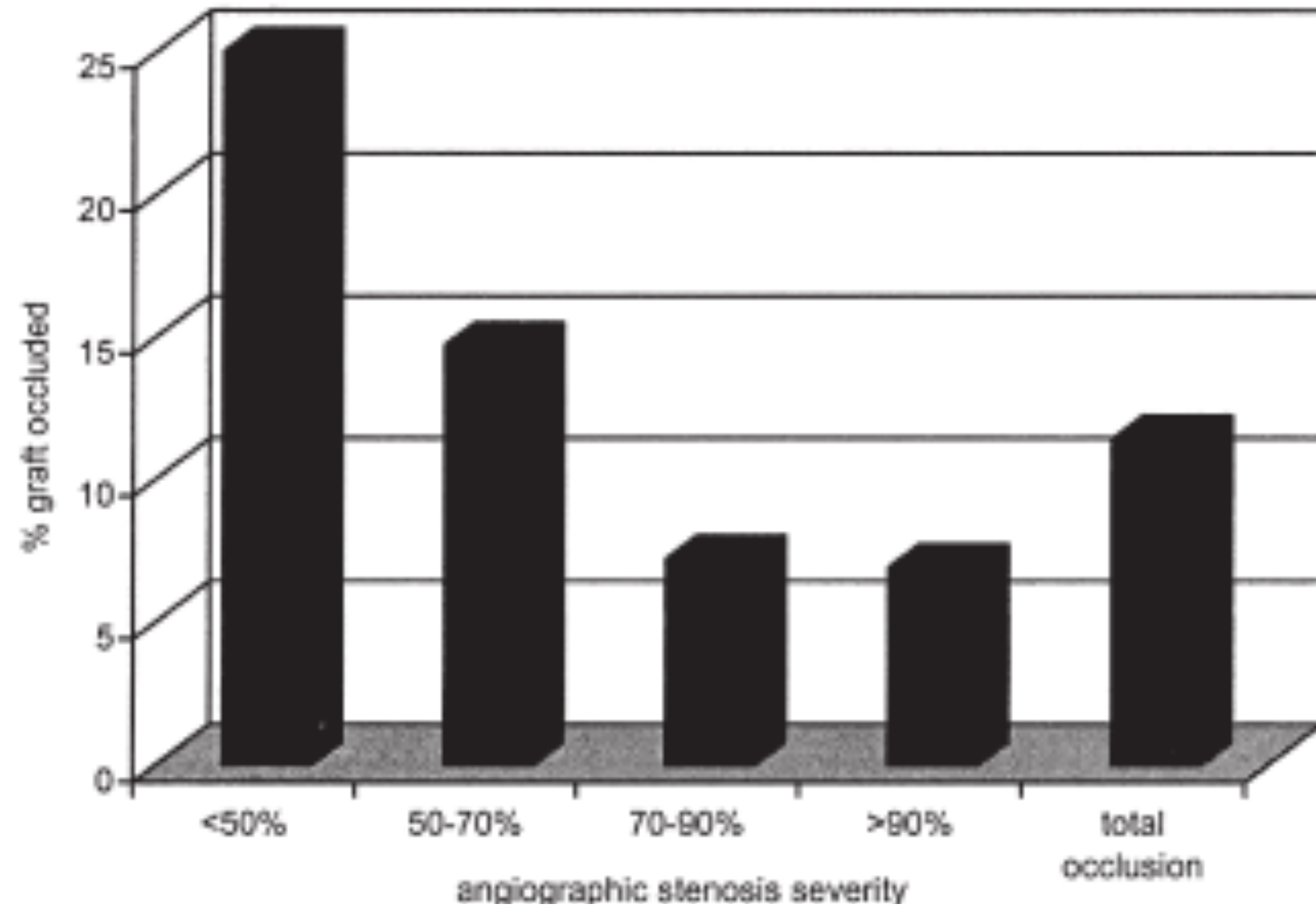


patients PCI et syntax score > 32:

FFR > controle

patients CABG et Syntax score > 32:

controle > FFR

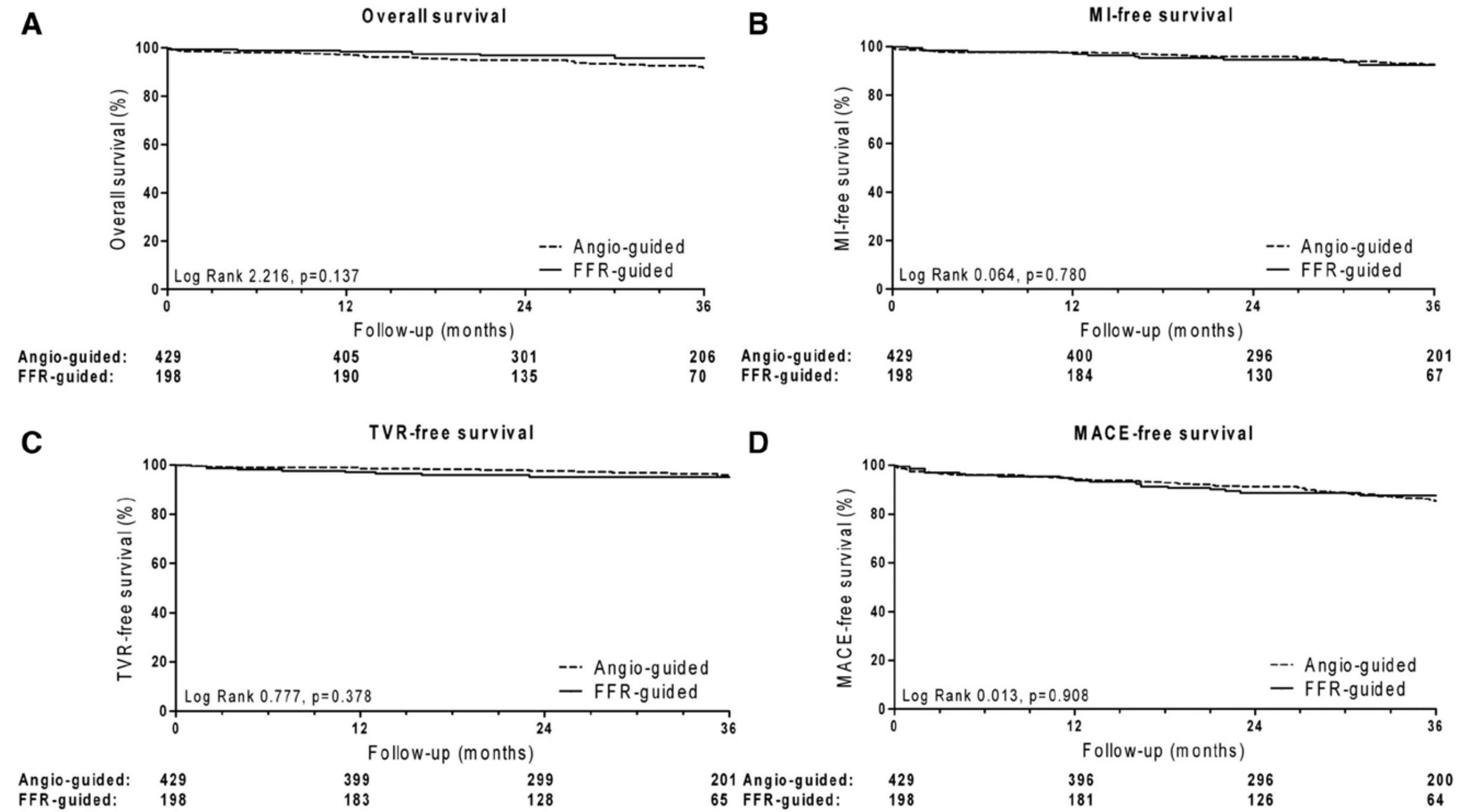


Vessels (total)	FFR ≤ 0.75	FFR > 0.75	p-Value
Patent	325	132	
Occluded	32	36	
Total	357	168	<0.0001
	8.9%	21.4%	

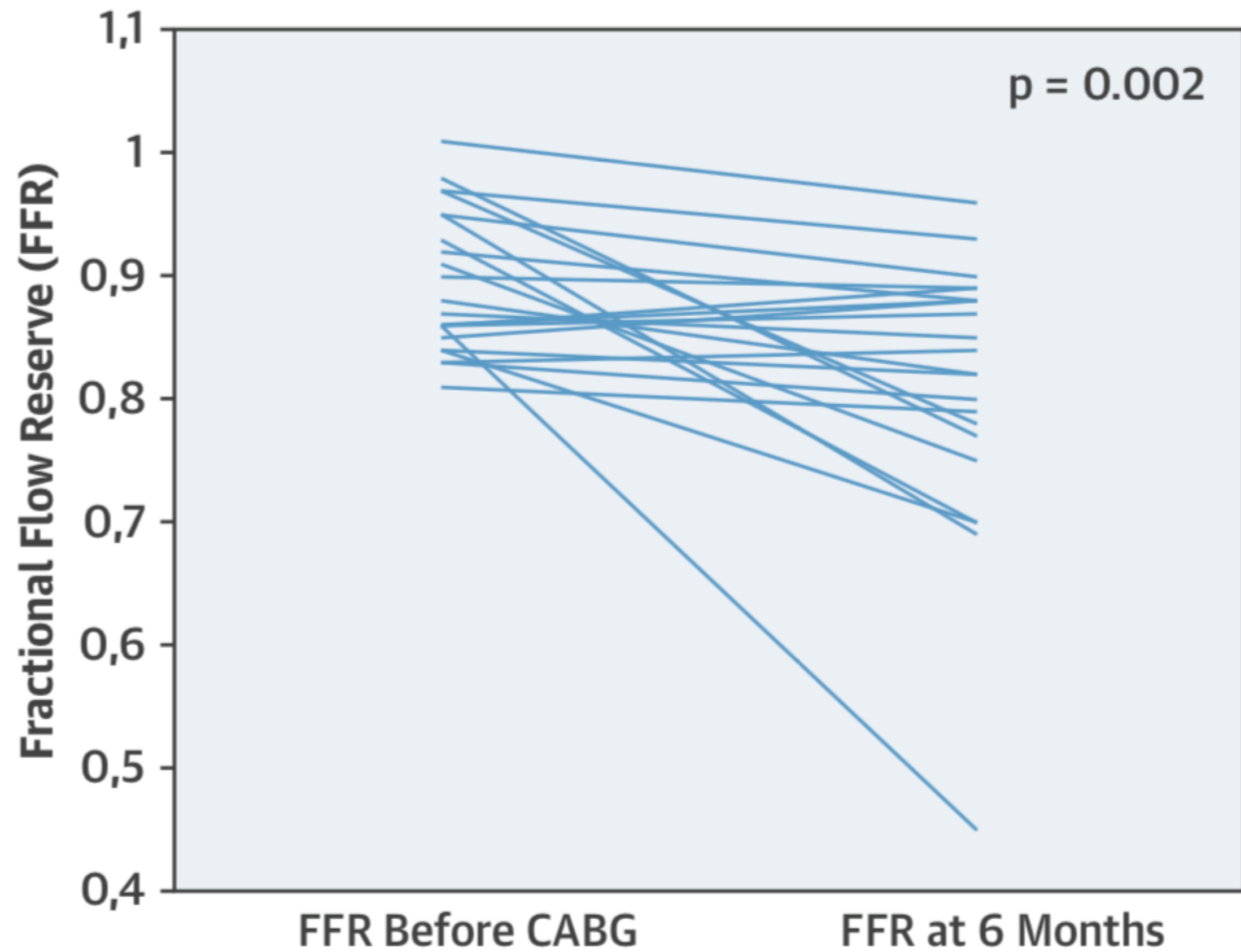
Intermediate Lesions	FFR ≤ 0.75	FFR > 0.75	p-Value
Patent	120	95	
Occluded	13	24	
	8.8%	28.2%	<0.02

Aucun impact clinique

6-month clinical endpoints (all patients)			
Death	0 (0)	2 (4)	0.24
Myocardial infarction	1 (2)	0 (0)	0.50
Stroke	2 (4)	1 (2)	0.51
All revascularizations before follow-up	3 (6)	3 (6)	1.00
Hybrid revascularization decided at CABG	1 (2)	3 (6)	
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MACCE	6 (12)	6 (12)	0.97
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Fractional Flow Reserve (FFR) in Deferred Lesions



Events in coronary arteries with index FFR >0.80			
Lesions with FFR ≤0.80 or graft failure at follow-up	9 (37.5) Lesions with FFR ≤0.80	2 (10) Graft failures	0.044
TVR/TVMI until follow-up	0	0	

Conclusion

La FFR bénéficie d'un environnement scientifique de très haut niveau qui en fait un outil incontournable dans l'évaluation des sténoses coronaires.

Pour la première fois deux études randomisées de stratégie thérapeutique, ou de revascularisation chirurgicale Vs évaluation classique sont négatives.

Malgré de nombreuses réserves sur ces deux études, il n'y a pas de preuve de la pertinence de la FFR chez le pluri tronculaire sévère dans le cadre de stratégies ouvertes ou d'élaboration d'un schéma de revascularisation chirurgical .

Plusieurs écueils en raison de la complexité des lésions.

Outil dont l'utilisation doit se faire uniquement dans le cadre de ce qui est validé : angioplastie coronaire de lésion intermédiaire du patient pluritronculaire simple

Outil qui alimente une réflexion qui reste clinique et médicale.