

Revascularisation pluritronculaire et SCA: encore des interrogations

N'oublions jamais la revascularisation chirurgicale!

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DÉCLARATION DE LIENS D'INTÉRÊT AVEC LA PRÉSENTATION

Aucun

STEMI

ESC 2018

- PCI/ fibrinolyse 1ere intention
- Emergency CABG may be indicated in selected STEMI patients unsuitable for PCI.

CABG should be considered in patients with ongoing ischaemia and large areas of jeopardized myocardium if PCI of the IRA cannot be performed.

IIa

C

STEMI

Recommandations AHA 2011

CABG si:

1. Atteinte du tronc et/ou tritronculaire
2. Ischémie après PCI (efficace ou non)
3. Anatomie non favorable à PCI
4. Complication mécanique de l'infarctus
5. Choc cardiogénique

STEMI et revascularisation chirurgicale

Phase aigue

- Situation rare (3 à 10 %)
- Pronostic engagé
- Stratégie de sauvetage
- Mortalité \approx 25 %
- Timing?
- Assistance temporaire (ECMO, Impella)

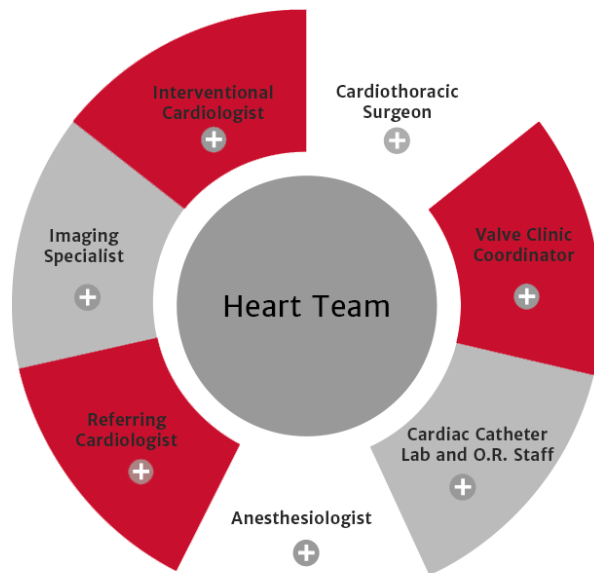
NSTEMI

- Pas de vrai comparaison PCI vs CABG
- Traitement de la lésion responsable
- Cartographie coronaire
- Patient stabilisé avec atteinte pluritronculaire ou lésions complexes => cf maladie coronaire stable

ESC 2015 (NSTEMI) et 2018

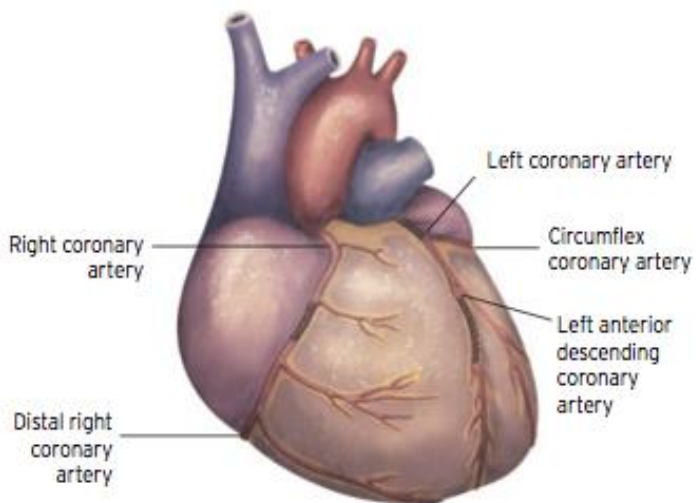
Bonne stratégie de revascularisation pour les patients complexes

- But: revascularisation complète
- Discussion Heart Team

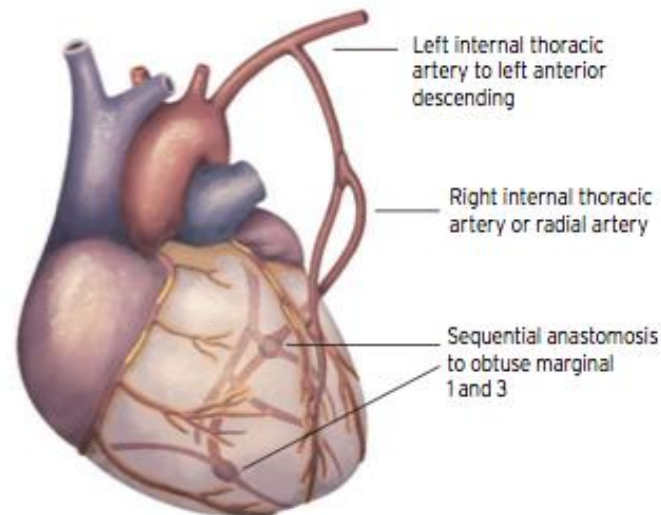


| Recommendations according to extent of CAD | CABG | | PCI | |
|--|--------------------|--------------------|--------------------|--------------------|
| | Class ^a | Level ^b | Class ^a | Level ^b |
| One-vessel CAD | | | | |
| Without proximal LAD stenosis. | IIb | C | I | C |
| With proximal LAD stenosis. ^{68,101,139–144} | I | A | I | A |
| Two-vessel CAD | | | | |
| Without proximal LAD stenosis. | IIb | C | I | C |
| With proximal LAD stenosis. ^{68,70,73} | I | B | I | C |
| Left main CAD | | | | |
| Left main disease with low SYNTAX score (0 - 22). ^{69,121,122,124,145–148} | I | A | I | A |
| Left main disease with intermediate SYNTAX score (23 - 32). ^{69,121,122,124,145–148} | I | A | IIa | A |
| Left main disease with high SYNTAX score (≥ 33). ^{c 69,121,122,124,146–148} | I | A | III | B |
| Three-vessel CAD without diabetes mellitus | | | | |
| Three-vessel disease with low SYNTAX score (0 - 22). ^{102,105,121,123,124,135,149} | I | A | I | A |
| Three-vessel disease with intermediate or high SYNTAX score (> 22). ^{c 102,105,121,123,124,135,149} | I | A | III | A |
| Three-vessel CAD with diabetes mellitus | | | | |
| Three-vessel disease with low SYNTAX score 0–22. ^{102,105,121,123,124,135,150–157} | I | A | IIb | A |
| Three-vessel disease with intermediate or high SYNTAX score (> 22). ^{c 102,105,121,123,124,135,150–157} | I | A | III | A |

PCI



CABG



FAVOURS PCI

Clinical characteristics

Presence of severe co-morbidity (not adequately reflected by scores)

Advanced age/frailty/reduced life expectancy

Restricted mobility and conditions that affect the rehabilitation process

Anatomical and technical aspects

MVD with SYNTAX score 0-22

Anatomy likely resulting in incomplete revascularization with CABG due to poor quality or missing conduits

Severe chest deformation or scoliosis

Sequelae of chest radiation

Porcelain aorta^a

FAVOURS CABG

Clinical characteristics

Diabetes

Reduced LV function (EF \leq 35%)

Contraindication to DAPT

Recurrent diffuse in-stent restenosis

Anatomical and technical aspects

MVD with SYNTAX score \geq 23

Anatomy likely resulting in incomplete revascularization with PCI

Severely calcified coronary artery lesions limiting lesion expansion

Need for concomitant interventions

Ascending aortic pathology with indication for surgery

Concomitant cardiac surgery

ESC 2018

Recommendations on revascularizations in patients with chronic heart failure and systolic left ventricular dysfunction (ejection fraction $\leq 35\%$)

| Recommendations | Class^a | Level^b |
|--|--------------------------|--------------------------|
| In patients with severe LV systolic dysfunction and coronary artery disease suitable for intervention, myocardial revascularization is recommended. ^{81,250} | I | B |
| CABG is recommended as the first revascularization strategy choice in patients with multivessel disease and acceptable surgical risk. ^{68,81,248,255} | I | B |
| In patients with one- or two-vessel disease, PCI should be considered as an alternative to CABG when complete revascularization can be achieved. | IIa | C |
| In patients with three-vessel disease, PCI should be considered based on the evaluation by the Heart Team of the patient's coronary anatomy, the expected completeness of revascularization, diabetes status, and comorbidities. | IIa | C |

ESC 2018

Quels sont les freins à la revascularisation chirurgicale?

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1. C'est invasif

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1. C'est invasif



Oui mais...

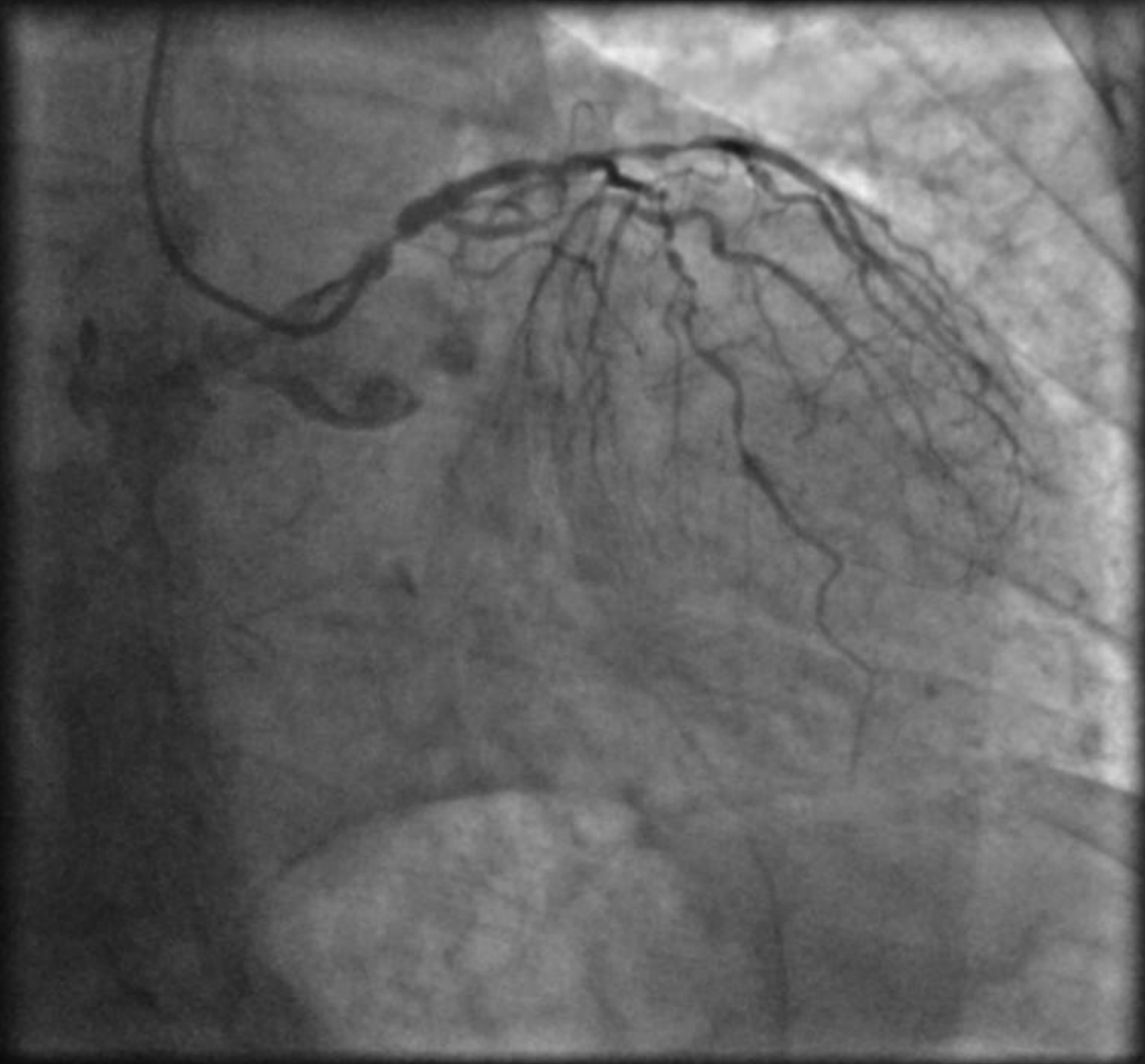
Durée d'hospitalisation post pontages:

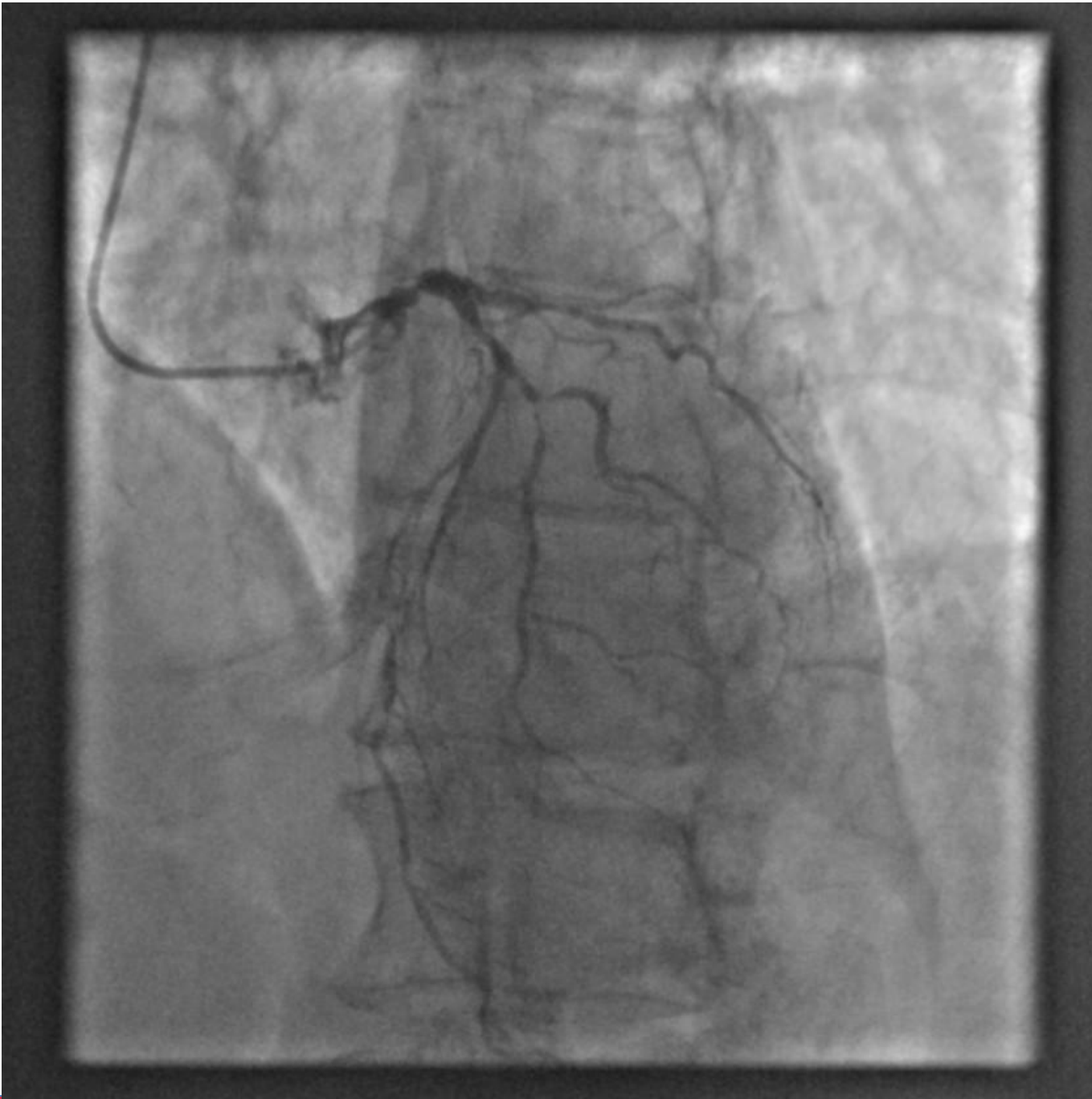
| Variable | BIMA-SVG (n = 249) | BIMA-RA (n = 249) | p Value |
|--|-----------------------|----------------------|---------|
| Mortality | 0.4 | 0.8 | 0.6 |
| De novo atrial fibrillation | 16.5 | 20.5 | 0.3 |
| Postoperative myocardial infarction ^a | 7.3 | 7.0 | 1.0 |
| Reexploration for bleeding | 2.4 | 4.8 | 0.2 |
| De novo renal failure ^b | 7.2 | 4.0 | 0.2 |
| Stroke | 1.2 | 2.0 | 0.7 |
| Deep sternal wound infection | 2.4 | 2.8 | 1.0 |
| IABP inserted postoperatively | 0.4 | 0.4 | 1.0 |
| Mechanical ventilation >48 hours | 0.8 | 0.8 | 1.0 |
| Hospital LOS, days | 6.4 ± 2.7 | 6.6 ± 6.2 | 0.7 |
| Intensive care unit LOS, days | 1.6 ± 1.2 | 1.8 ± 2.2 | 0.3 |

Mohammadi *et al*, ATS
2016;101:913-8

Patient né en 1937 (81 ans)

- Pas de diabète
- NSTEMI antérieur → coronarographie
- ACR sur FV per coro sur sténose critique du TC + réseau gauche multisténosé (1 CEE, low flow 1 min)





Patient né en 1937 (81 ans)

- NSTEMI antérieur → coronarographie
- ACR sur FV per coro sur sténose critique du TC + réseau gauche multisténosé (1 CEE, low flow 1 min)
- Pontages à J+4 (PAC x3 Y mammaire MIG-IVA-D1, MID-M1)
- Suites simples
- Durée de séjour réanimation 3 jours
- Sortant 7 jours après pontages

Autre exemple:

Patient de 63 ans

- FDR: tabac sevré, dyslipidémie, HTA, surcharge pondérale
- En activité (pharmacien)
- Découverte fortuite onde Q inférieur -> atteinte réseau gauche avec IVA proximale, thrombose de la CX distale et M2 reprise par la CD, CD petit calibre dominée
- FE 50 %

Orientation chirurgie devant les lésions, bas risque opératoire

- Pontage x 2, Y mammaire, MIG-IVA, MID-M2
- Suites simples
- Sortie à domicile J10
- A 3 mois reprise activité professionnelle et activités habituelles...



Evolution des protocoles d'anesthésie et et réanimation avec programmes de « *Fast Track* »

- Diminution de la prémédication
 - Amélioration du réveil postopératoire
 - Analgésie mieux contrôlée, diminution des doses de morphine
 - 1^{er} lever rapide
-
- > optimisation pré et postopératoire
 - > diminution des durées d'hospitalisation

Quels sont les freins à la revascularisation chirurgicale?

1. C'est invasif
- 2. Le patient n'est pas « chaud » pour la chirurgie**

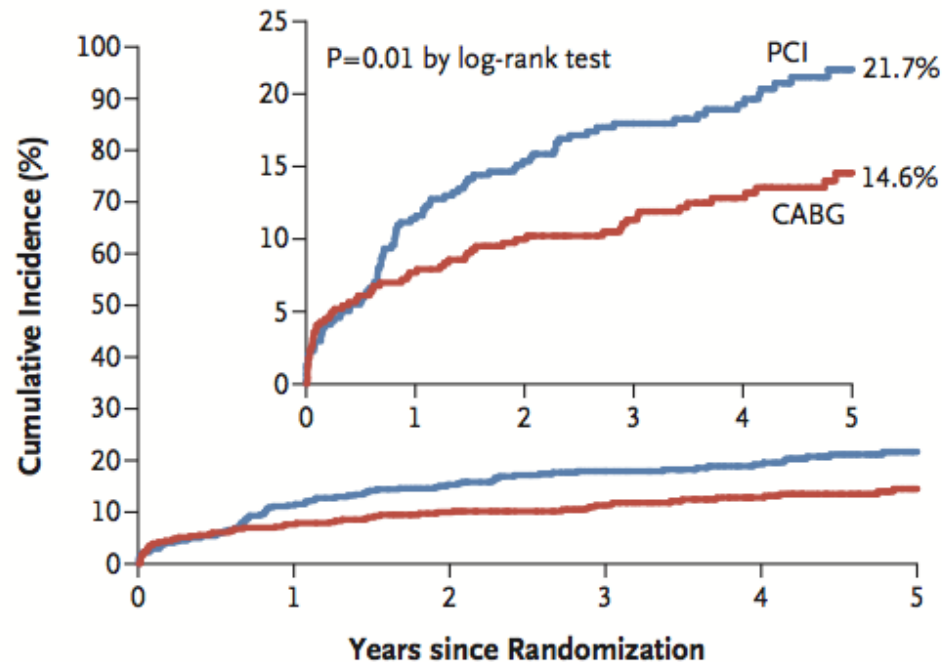
4.1 Patient information and informed consent

Informed consent requires transparency, especially if there is debate over various treatment options. Active patient participation in the decision-making process should be encouraged. Patient information needs to be unbiased, evidence-based, up-to-date, reliable, accessible, relevant, and consistent with legal requirements. Use of terminology that the patient understands is essential. Short-term procedure-related and long-term risks and benefits—such as survival, relief of angina, quality of life, the potential need for late reintervention, the need for prevention measures, and uncertainties associated with different treatment strategies—should be thoroughly discussed. Although current recommendations are mostly based on the ability of treatments to reduce adverse events including mortality, there is growing interest in patient-reported outcome measures.^{40,41} Patients are not only interested to know how recommended treatment impacts on prognosis but also on their quality of life in the way they perceive it. A written evidence-based patient information document should be provided, potentially with decision aids.

Quels sont les freins à la revascularisation chirurgicale?

2. Le patient n'est pas « chaud » pour la chirurgie

B Death, Myocardial Infarction, Stroke, or Repeat Revascularization



No. at Risk

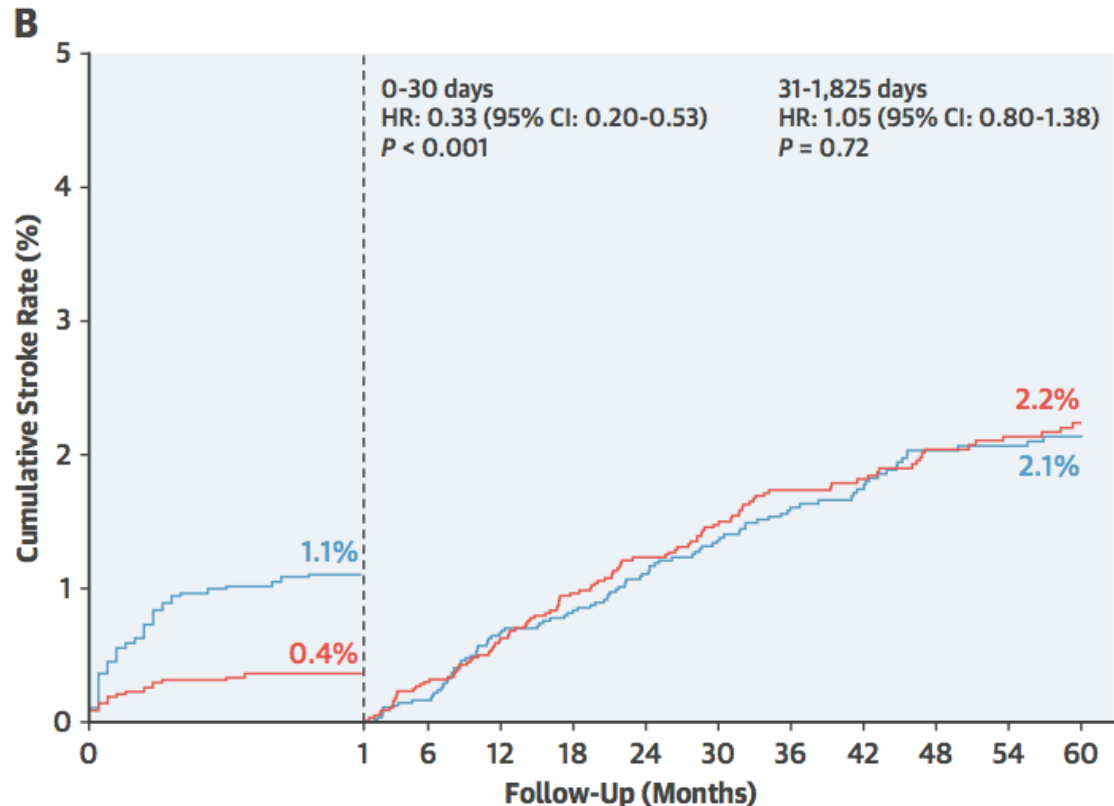
| | | | | | | |
|------|-----|-----|-----|-----|-----|-----|
| PCI | 438 | 389 | 341 | 288 | 229 | 117 |
| CABG | 442 | 409 | 368 | 317 | 250 | 137 |

Park *et al*, *NEJM*
2015, *BEST trial*

Quels sont les freins à la revascularisation chirurgicale?

1. C'est invasif
2. Le patient n'est pas « chaud » pour la chirurgie
- 3. Le risque d'AVC est plus élevé avec la chirurgie**

Stroke Rates Following Surgical Versus Percutaneous Coronary Revascularization



Number at Risk

| | | | | | | | | | | | | |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| CABG | 5,765 | 5,555 | 5,421 | 5,282 | 5,138 | 4,901 | 4,550 | 3,677 | 3,446 | 3,213 | 2,957 | 2,202 |
| PCI | 5,753 | 5,643 | 5,545 | 5,415 | 5,265 | 5,044 | 4,653 | 3,788 | 3,554 | 3,320 | 3,038 | 2,360 |

— Percutaneous coronary intervention (PCI) — Coronary artery bypass grafting (CABG)

- 11 RCT (SYNTAX, NOBLE, FREEDOM...)
- 11518 patients (+ de 5000 dans chaque bras)

TABLE 1 Baseline, Procedural, and Discharge Data of Randomized Cohorts

| | PCI (n = 5,753) | CABG (n = 5,765) |
|-----------------------------|--------------------|---------------------|
| Age, yrs | 63.6 ± 9.8 (5,753) | 63.7 ± 9.9 (5,765) |
| Female | 23.9 (1,373/5,753) | 23.8 (1,371/5,765) |
| BMI >30 kg/m ² | 28.1 (1,548/5,506) | 28.3 (1,558/5,511) |
| Smoking, current | 22.3 (1,274/5,701) | 22.3 (1,273/5,703) |
| Diabetes | 38.5 (2,215/5,753) | 37.7 (2,171/5,765) |
| Insulin treatment | 12.9 (545/4,234) | 11.9 (504/4,245) |
| Hypertension | 67.6 (3,880/5,739) | 68.1 (3,913/5,748) |
| Hypercholesterolemia | 69.5 (3,982/5,726) | 67.3 (3,862/5,735) |
| Peripheral vascular disease | 8.2 (424/5,158) | 8.5 (440/5,164) |
| Carotid artery disease | 7.8 (161/2,072) | 8.1 (168/2,074) |
| Previous TIA or CVA | 5.4 (218/4,052) | 6.2 (253/4,054) |
| Previous MI | 28.0 (1,438/5,138) | 27.5 (1,417/5,156) |
| LV dysfunction, <30% | 0.9 (49/5,303) | 1.0 (54/5,430) |
| Unstable disease | 34.6 (1,786/5,158) | 34.2 (1,767/5,160) |
| 3-vessel disease* | 58.6 (2,460/4,201) | 61.8 (2,594/4,197) |
| Left main disease | 38.8 (2,233/5,753) | 38.9 (2,245/5,765) |
| SYNTAX score | 26.0 ± 9.3 (4,081) | 26.0 ± 9.8 (4,057) |
| PCI-DES used† | 73.4 (4,120/5,610) | — |
| PCI-number of stents | 3.1 ± 2.0 (4,935) | — |
| CABG-LIMA use | — | 96.2 (4,574/4,753) |
| CABG-BIMA use | — | 18.7 (771/4,122) |
| CABG-off-pump | — | 27.5 (1,085/3,945) |
| Aspirin at discharge | 97.3 (4,487/4,612) | 95.5 (3,814/3,994) |
| Thienopyridine at discharge | 96.7 (4,479/4,630) | 45.1 (1,815/4,026) |
| DAPT at discharge | 95.1 (4,384/4,612) | 44.0 (1,759/3,994) |

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Discussion

Periprocedural strokes are more common after CABG, with an absolute incremental risk of $\sim 0.7\%$ observed in the present large-scale study. The mechanisms underlying the increased risk of stroke with surgery are likely multifactorial. First, most CABG procedures are performed on-pump with cannulation and clamping of the aorta; even if they are performed off-pump, the aorta is often manipulated for construction of the proximal anastomosis (19-21). Data from cohort studies suggests that limiting, if not completely avoiding, aortic manipulation by performing an anaortic off-pump CABG procedure reduces stroke rates substantially (22,23). The use of bilateral internal mammary arteries avoids the need for proximal anastomoses and side-clamping of the aorta and has been associated with lower stroke rates (24). In the current study, the rate of bilateral internal mammary arteries use was relatively low. Second,



Navia *et al*, Annals of Thoracic Surgery 2016

- 2098 patients avec double mammaire et Y mammaire à cœur battant
- Taux d'AVC postopératoire 0,5 %

Pour diminuer le taux d'AVC:

- Vers le *no touch* aortique!
- Limitation du nombre de clampage aortique
- Diminution du nombre de greffon à réimplanter sur l'aorte
- *On pump/off pump*

Quels sont les freins à la revascularisation chirurgicale?

1. C'est invasif
2. Le patient n'est pas « chaud » pour la chirurgie
3. Le risque d'AVC est plus élevé avec la chirurgie
- 4. Le taux de médiastinite est trop élevé**



Quels sont les freins à la revascularisation chirurgicale?

4. Le taux de médiastinite est trop élevé

- 2 à 4 % des pontages
- Facteurs favorisants: double mammaire, diabète (déséquilibré), obésité, insuffisance rénale dialysée
- Amélioration du pronostic: collaboration infectiologues, pansements par thérapie à pression négative (TPN)
- Impact sur la qualité de vie (soins prolongés > 3 mois)

Mediastinite post pontages coronariens: prévention

- Choix du 2eme greffon selon risque lié au patient
- Squelettisation de l'artère mammaire
- Prélèvement de la mammaire droite limité
- > stratégie d'épargne sternale au cas par cas



Pour conclure

