



Collège  
National des  
Cardiologues des  
Hôpitaux

CENTRE HOSPITALIER  
DE VERSAILLES



# Voie d'abord optimale pour la coronarographie de pontages

Congrès du CNCH 2017  
**SPEED DATA CONTEST**

**« Double ulnaire pour double mammaire ! »**

Alexandre GAUTIER  
DES de Cardiologie - Paris

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## Mme X. 63ans

- Diabète de type 2 sous ADO
- HTA
- Obésité (IMC 33 kg/m<sup>2</sup>)

Cardiopathie ischémique traitée  
par angioplastie puis **pontage**

Récidive d'**angor d'effort** sous  
traitement médical

Coro n°1 voie **radiale droite**  
Coro n°2 voie **radiale gauche**  
(spasme radial droit)  
Coro N°3 **voie fémorale**  
(spasme radial bilatéral++)

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**Choc hémorragique sur**  
**hématome du scarpa**  
**Femostop®**  
**Transfusion**

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Coro n°4  
voie **ulnaire droite** : réseau natif et greffon MID  
voie **ulnaire gauche**: greffon MIG

Coro n°1 voie **radiale droite**  
Coro n°2 voie **radiale gauche**  
(spasme radial droit)  
Coro N°3 **voie fémorale**  
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## Pontages aorto-coronaire (PAC)

- **Environ 20 000/an en France**  
(données OCDE 2011-2015)
- Meilleure espérance de vie des coronariens
- **Contrôle angiographique de PAC souvent nécessaire**

# Coronarographie de pontages aorto-coronaire : **quelle voie d'abord vasculaire ?**

**Montage du PAC ?**

**Antécédent de complication vasculaire ?**

**Facteur de risque hémorragique ?**

**Abord vasculaire impossible ?**

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# Coronarographie de pontages aorto-coronaire : quelle voie d'abord vasculaire ?

## OBJECTIFS

Montage du PAC ?

Antécédent de complication vasculaire ?

Facteur de risque hémorragique ?

Abord vasculaire impossible ?

Opacification complète

↘ Complication vasculaire

↘ Temps de scopie

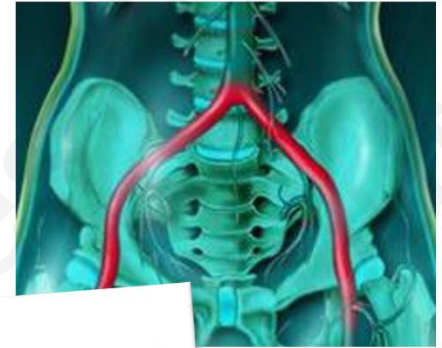
↘ Quantité de produit de contraste

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# Radiale vs Fémorale ?



Am J Cardiol. 2016 Apr 15;117(4):1248-55. doi: 10.1016/j.amjcard.2016.01.016. Epub 2016 Jan 28. 2016

**Meta-Analysis of Radial Versus Femoral Artery Approach for Coronary Procedures in Patients With Previous Coronary Artery Bypass Grafting.**

Rigattieri O<sup>1</sup>, Sciahbasi A<sup>2</sup>, Brilakis ES<sup>3</sup>, Burzotta F<sup>4</sup>, Rathore S<sup>5</sup>, Pugliese FR<sup>2</sup>, Fedele S<sup>2</sup>, Ziakas AG<sup>6</sup>, Zhou YJ<sup>7</sup>, Guzman LA<sup>8</sup>, Anderson RA<sup>9</sup>.

Association between arterial access site and major bleeding and mortality: A historical cohort study in a general population

Wang Y, et al. JAMA. 2014;311(11):1141-50. doi: 10.1001/jama.2014.1141. Epub 2014 May 14.

PLoS One. 2014 May 12;9(5):e96127. doi: 10.1371/journal.pone.0096127. eCollection 2014.

**Transradial versus transfemoral approach in patients undergoing percutaneous coronary intervention for acute coronary syndrome. A meta-analysis and trial sequential analysis of randomized controlled trials.**

Piccolo R<sup>1</sup>, Galasso G<sup>1</sup>, Capuano E<sup>1</sup>, De Luca S<sup>1</sup>, Esposito G<sup>1</sup>, Trimarco B<sup>1</sup>, Piscione F<sup>2</sup>.

J Invasive Cardiol. 2017 Oct 15. pii: JIC20171015-1. [Epub ahead of print] 2017

**Comparison of Radial Access, Guided Femoral Access, and Non-Guided Femoral Access Among Women Undergoing Percutaneous Coronary Intervention.**

Koshy LM<sup>1</sup>, Aberle LH, Krucoff MW, Hess CN, Mazzaferri E Jr, Jolly SS, Jacobs A, Gibson CM, Mehran R, Gilchrist IC, et al. JAMA. 2017;317(12):1248-55. doi: 10.1001/jama.2017.1248. Epub 2017 Oct 15.

## THE LANCET MATRIX Trial 2015

**Radial versus femoral access in patients with acute coronary syndromes undergoing invasive management: a randomised multicentre trial**

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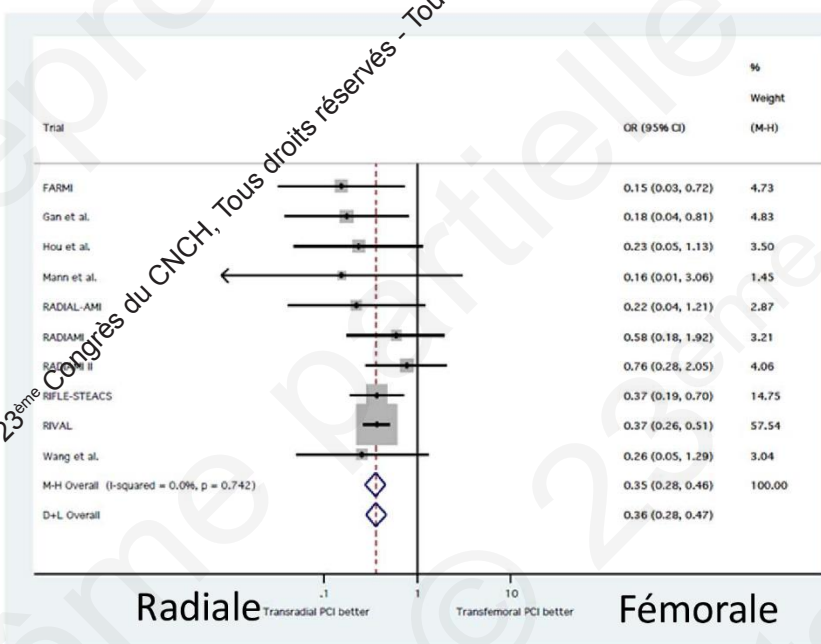


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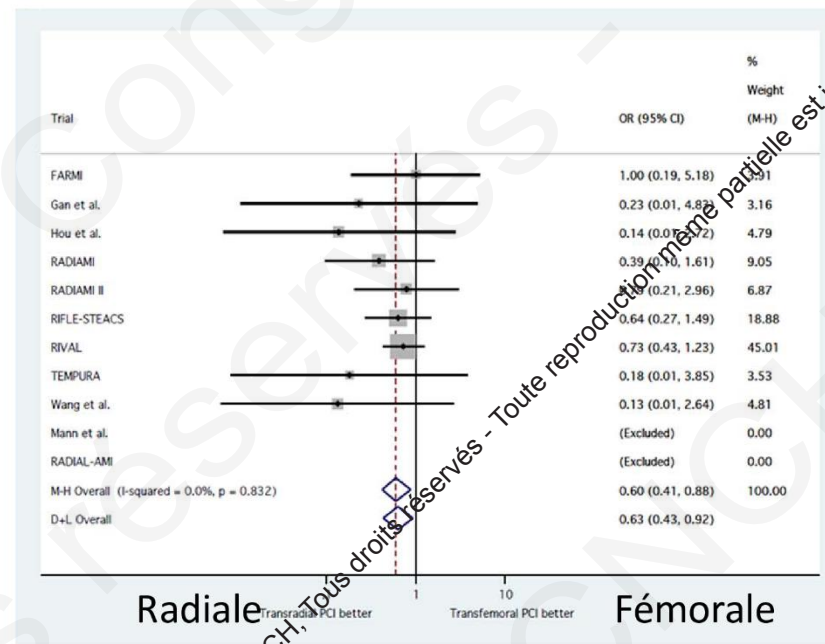
9200 patients

**RADIALE > FEMORALE**



### Complications vasculaires

OR 0.35 ; IC 95%: 0.28-0.46 ; p < 0.001



### Complications hémorragiques majeures

OR 0.60 ; IC 95%: 0.41-0.88 ; p < 0.008

# THE LANCET MATRIX Trial 2015

## Radial versus femoral access in patients with acute coronary syndromes undergoing invasive management: a randomised multicentre trial

	Radial access (n=4197)	Femoral access (n=4207)	Rate ratio (95% CI)	p value
<b>Adjudicated events</b>				
Coprimary composite of all-cause mortality, myocardial infarction, or stroke	367 (8.8%)	429 (10.3%)	0.85 (0.74-0.99)	0.0307
Coprimary composite of all-cause mortality, myocardial infarction, stroke, or BARC 3 or 5 bleed	410 (9.8%)	486 (11.7%)	0.83 (0.73-0.96)	0.0092
Composite of all-cause mortality, myocardial infarction, stroke, urgent TVR, definite or probable thrombosis, or BARC 3 or 5 bleed	419 (10.0%)	491 (11.8%)	0.84 (0.74-0.97)	0.0142
All-cause mortality	66 (1.6%)	91 (2.2%)	0.72 (0.53-0.99)	0.0450
Cardiovascular	64 (1.5%)	85 (2.1%)	0.75 (0.54-1.04)	0.08
Cardiac	62 (1.5%)	79 (1.9%)	0.78 (0.56-1.09)	0.15
Vascular	2 (0.0%)	6 (0.1%)	0.33 (0.07-1.65)	0.16
Non-cardiovascular	2 (0.0%)	6 (0.2%)	0.33 (0.07-1.65)	0.16
Myocardial infarction	299 (7.2%)	330 (7.9%)	0.90 (0.77-1.06)	0.20
Q-wave	6 (0.1%)	3 (0.1%)	2.00 (0.50-7.99)	0.32
STEMI	37 (0.9%)	30 (0.7%)	1.23 (0.76-2.00)	0.39
NSTEMI	197 (4.7%)	238 (5.7%)	0.82 (0.68-1.00)	0.0450
Unclassified*	65 (1.6%)	63 (1.5%)	1.03 (0.73-1.46)	0.86
Stroke	16 (0.4%)	16 (0.4%)	1.00 (0.50-2.00)	1.00
Ischaemic	12 (0.3%)	11 (0.3%)	1.09 (0.48-2.47)	0.84
Haemorrhagic	3 (0.1%)	5 (0.1%)	0.60 (0.14-2.51)	0.48
Uncertain origin†	1 (0.0%)	0 (0.0%)	3.01 (0.12-73.87)	0.50
Transient ischaemic attack	5 (0.1%)	13 (0.3%)	0.38 (0.14-1.08)	0.0588
Urgent target vessel revascularisation	49 (1.2%)	40 (1.0%)	1.23 (0.81-1.86)	0.34

	Radial access (n=4197)	Femoral access (n=4207)	Rate ratio (95% CI)	p value
(Continued from previous page)				
<b>Stent thrombosis</b>				
Definite	30 (0.7%)	27 (0.6%)	1.11 (0.66-1.87)	0.69
Acute	21 (0.5%)	12 (0.3%)	1.75 (0.86-3.57)	0.12
Subacute	10 (0.2%)	15 (0.4%)	0.66 (0.30-1.48)	0.31
Definite or probable	42 (1.0%)	38 (0.9%)	1.10 (0.71-1.71)	0.66
Acute	24 (0.6%)	14 (0.3%)	1.72 (0.89-3.32)	0.11
Subacute	20 (0.5%)	24 (0.6%)	0.83 (0.46-1.50)	0.54
Bleeding	350 (8.4%)	606 (14.6%)	0.55 (0.48-0.63)	<0.0001
<b>BARC classification</b>				
Type 1	168 (4.0%)	306 (7.4%)	0.54 (0.44-0.65)	<0.0001
Type 2	127 (3.1%)	215 (5.2%)	0.58 (0.47-0.73)	<0.0001
Type 3	54 (1.3%)	84 (2.1%)	0.64 (0.45-0.90)	0.0098
Type 3a	29 (0.7%)	44 (1.1%)	0.66 (0.41-1.05)	0.08
Type 3b	23 (0.6%)	37 (0.9%)	0.62 (0.37-1.04)	0.41
Type 3c	2 (0.0%)	4 (0.1%)	0.50 (0.09-2.72)	0.41
Type 4	6 (0.1%)	6 (0.1%)	1.00 (0.32-3.10)	1.00
Type 5	10 (0.2%)	11 (0.3%)	0.91 (0.39-2.14)	0.82
Type 5a	6 (0.1%)	9 (0.2%)	0.67 (0.24-1.87)	0.44
Type 5b	4 (0.1%)	2 (0.0%)	2.00 (0.37-10.92)	0.41
Type 3 or 5	64 (1.6%)	95 (2.3%)	0.67 (0.49-0.92)	0.0128
Related to access site	16 (0.4%)	43 (1.1%)	0.37 (0.21-0.66)	0.0004
Not related to access site	48 (1.2%)	52 (1.3%)	0.92 (0.62-1.36)	0.68
Type 2, 3, or 5	189 (4.6%)	307 (7.4%)	0.60 (0.50-0.73)	<0.0001
Related to access site	69 (1.7%)	187 (4.8%)	0.34 (0.26-0.45)	<0.0001
Not related to access site	121 (2.9%)	115 (2.8%)	1.05 (0.81-1.36)	0.70
<b>TIMI classification</b>				
Major bleeding	26 (0.6%)	37 (0.9%)	0.70 (0.42-1.16)	0.16
Minor bleeding	24 (0.6%)	32 (0.8%)	0.75 (0.44-1.27)	0.28
Major or minor bleeding	50 (1.2%)	69 (1.7%)	0.72 (0.50-1.04)	0.08
<b>GUSTO classification</b>				
Severe bleeding	23 (0.6%)	27 (0.6%)	0.85 (0.49-1.48)	0.57
Moderate bleeding	23 (0.6%)	32 (0.8%)	0.72 (0.42-1.22)	0.22
Mild bleeding	306 (7.4%)	549 (13.3%)	0.54 (0.47-0.62)	<0.0001
Moderate or severe bleeding	46 (1.1%)	59 (1.4%)	0.78 (0.53-1.14)	0.20
<b>Non-adjudicated events</b>				
Composite of surgical access site repair or blood products transfusion	41 (1.0%)	73 (1.8%)	0.56 (0.38-0.82)	0.0025
Surgical access site repair	4 (0.1%)‡	15 (0.4%)	0.27 (0.09-0.80)	0.0115
Red blood cell transfusion	40 (1.0%)	64 (1.5%)	0.62 (0.42-0.92)	0.0176

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Type 4	44 (1.1%)	37 (0.9%)	0.66 (0.41-1.05)	0.08
Type 5	6 (0.1%)	4 (0.1%)	0.50 (0.09-2.72)	0.41
Type 2, 3, or 4	11 (0.3%)	6 (0.1%)	1.00 (0.32-3.10)	1.00
Type 3 or 4	11 (0.3%)	6 (0.1%)	0.91 (0.39-2.24)	0.82
Type 4 or 5	9 (0.2%)	2 (0.0%)	0.67 (0.24-1.87)	0.44
Type 3 or 5	2 (0.0%)	2 (0.0%)	2.00 (0.37-10.92)	0.41
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**CHANGE IN RECOMMENDATIONS**

**2012** **2017**

**Radial access<sup>a</sup>**

**MATRIX<sup>143</sup>**

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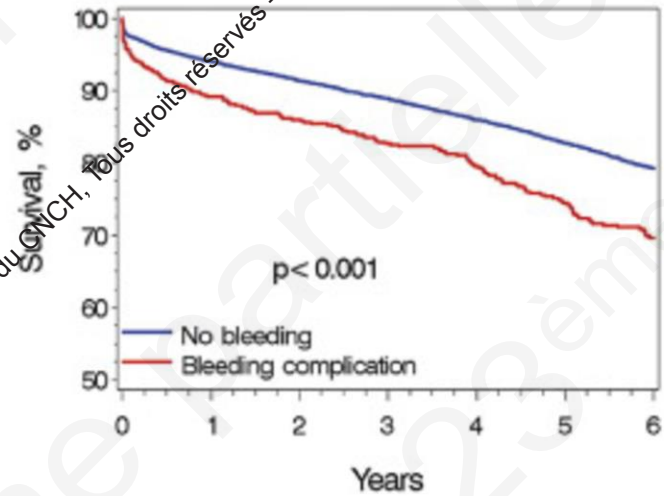
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# Major Femoral Bleeding Complications After Percutaneous Coronary Intervention

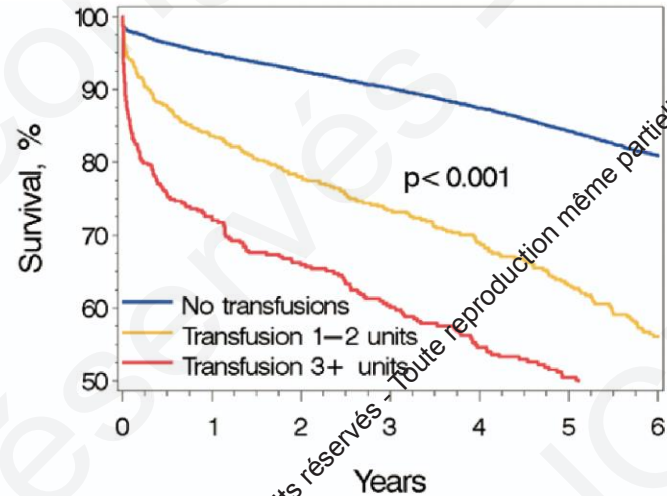
Incidence, Predictors, and Impact on Long Term Survival Among 17,901 Patients Treated at the Mayo Clinic From 1994 to 2005 Doyle et al. JACC 2008

## 30 days mortality after PCI



No bleeding	13600	11747	10270	8657	7662	6478	5248
Bleeding complication	652	539	475	421	381	329	294

**HR 14.2 ; IC95% [9.95 - 20.3] ;  $p < 0.01$**



No transfusions	13260	11539	10100	8815	7575	6421	5227
Transfusion 1-2 units	605	477	411	363	302	243	185
Transfusion 3+ units	389	312	236	202	158	143	121

Transfusion  $\geq 3$  U

**HR 18.1 ; IC95% [13.7 - 24.0] ;  $p < 0.0001$**

Transfusion 1-2 U

**HR 8.9 ; IC95% [6.3 - 12.6] ;  $p < 0.0001$**

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# Meta-Analysis of Radial Versus Femoral Artery Approach for Coronary Procedures in Patients With Previous Coronary Artery Bypass Grafting.

Rigattierri et al. Am J Cardiology 2016

**Complications au point de ponction**  
**OR 0.46 ; IC 95% : 0.26-0.80 ; p = 0.006**

**Taux de cross-over pour une autre voie d'abord**  
**OR 7.0 ; IC 95% : 2.74-17.87 ; p < 0.0001**

**Pas de différence concernant:**

- Temps de procédure
- Temps de scopie
- Quantité de produit de contraste

**2 763 patients**

Odds Ratio  
M-H, Random, 95% CI

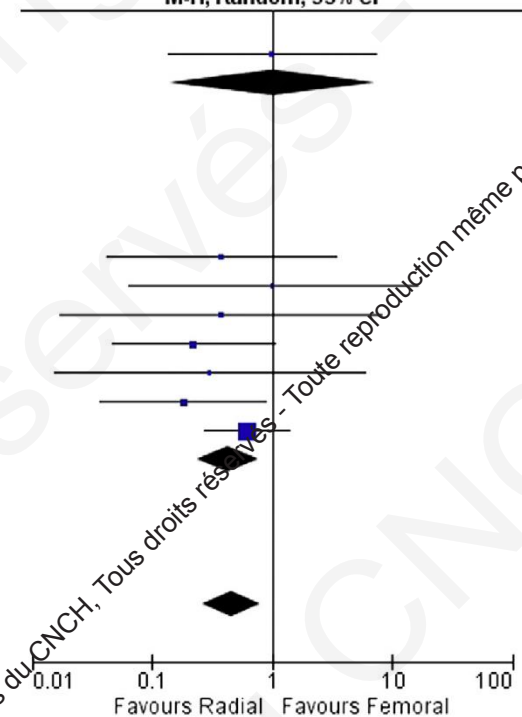
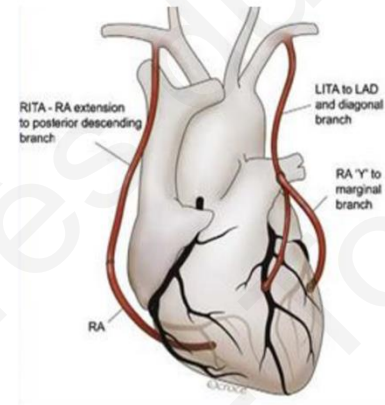
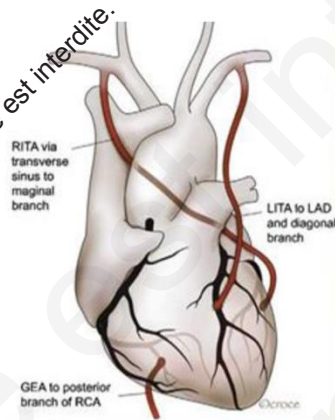
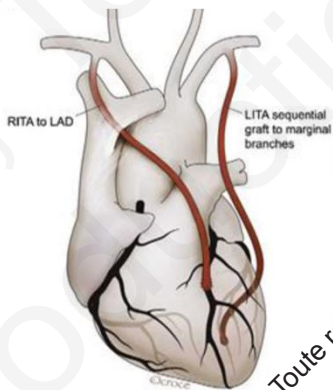
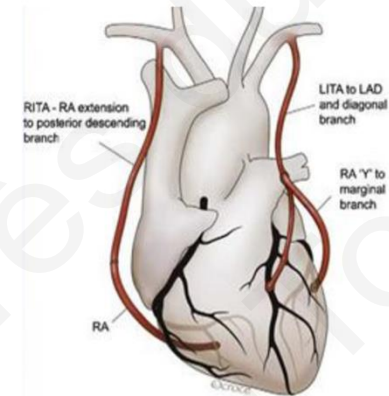
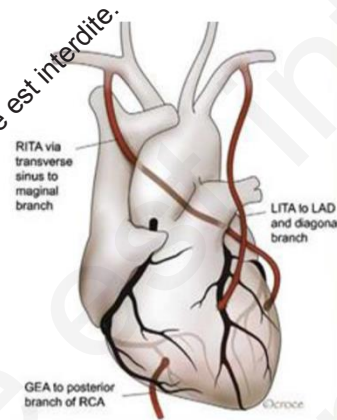
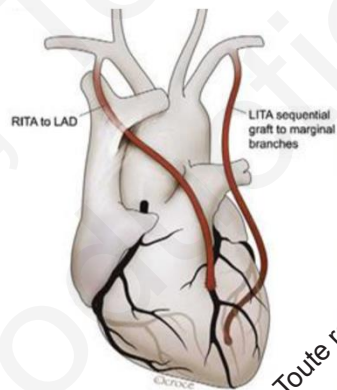


Figure 7. Meta-analysis of access-site complications.



Double PAC mammaire interne pédiculés  
Quelle voie d'abord ?

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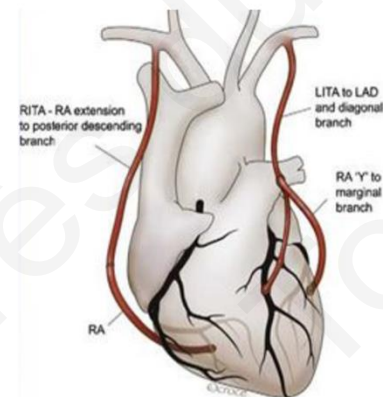
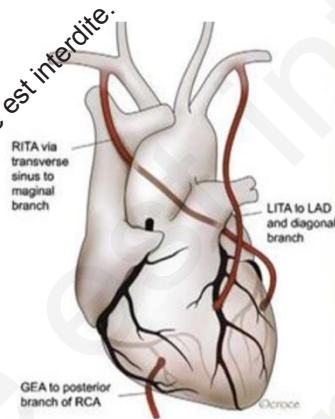
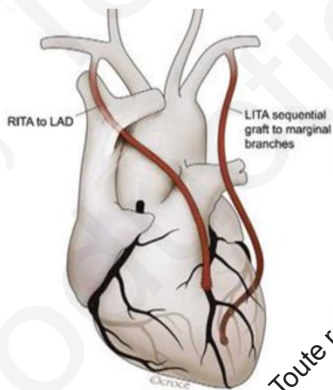


## Double PAC mammaire interne pédiculés Quelle voie d'abord ?

Fémorale

Radiale bilatérale

Radiale droite seule



Double PAC mammaire interne pédiculés  
Quelle voie d'abord ?

Fémorale

Radiale bilatérale

Radiale droite seule

Voie Ulaire



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## Radiale droite seule - AMIG

Catheter Cardiovasc Interv. 2002 Jun;56(2):188-95.

**Feasibility and safety of concomitant left internal mammary arteriography at the setting of the right transradial coronary angiography.**

Cha KS<sup>1</sup>, Kim MH.

**Taux de succès 89% (164 patients)**

**Aucune complication vasculaire ni cérébrale**

Indian Heart J. 2010 May-Jun;62(3):255-7.

**Safety and feasibility of selective angiography of left internal mammary artery grafts via right transradial approach.**

Valsecchi O<sup>1</sup>, Vassileva A.

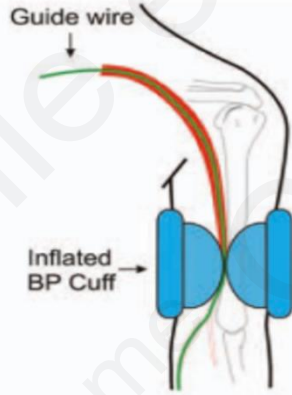
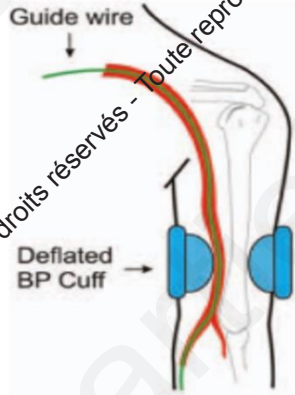
**Taux de succès 89% (218 patients)**

**Echecs → tortuosités TABC / artère sous-clavière G**

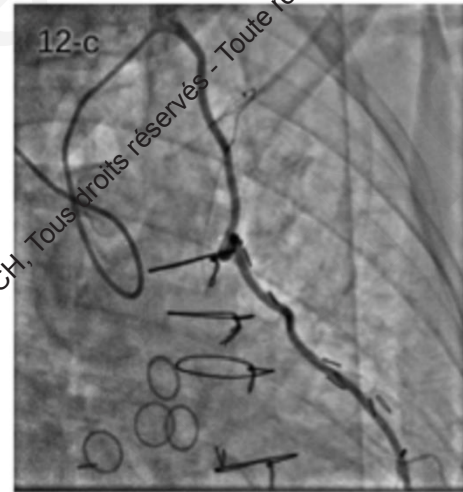
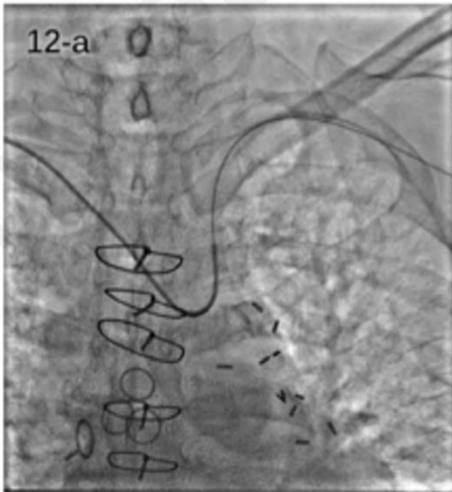
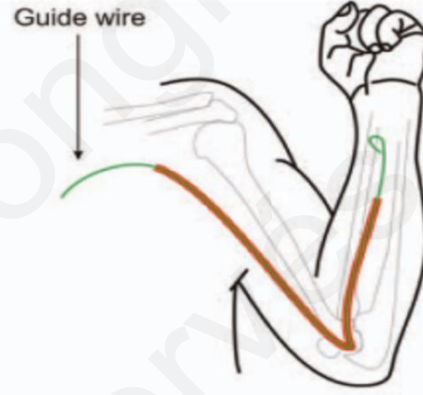
**ATL chez 13 patients**

**Aucune complication vasculaire ni cérébrale**

# Radiale droite - AMIG



LIMA Cannulation Through Right TRA



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## Voie Ulnaire: alternative à la Radiale ?

### **Transulnar Versus Transradial Access for Coronary Angiography or Percutaneous Coronary Intervention: A Meta-Analysis of Randomized Controlled Trials**

2744 patients

Dahal K et al. Catheterization and Cardiovascular Interventions 2016

Pas de différence concernant:

- MACE
- Complication au point de ponction
- Temps de scopie
- Quantité de produit de contraste utilisé

Taux de **cross-over** : ulnaire > radiale

RR: 2.31 ; IC95%[1.07-4.98] ; p = 0.003

### **Possibilité d'athérectomie rotative et d'angioplastie complexe**

#### **Feasibility and safety of transulnar access for performing rotational atherectomy.**

#### **Sheathless transulnar versus standard femoral arterial access for percutaneous coronary intervention on bifurcation lesions.**

Deftereos S et al. Int J Cardiol 2011



Collège  
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Cardiologues des  
Hôpitaux

**MERCI !**

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